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UNITED STATES DEPARTMENT OF LABOR
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OFFICE OF FEDERAL CONTRACT COMPLIANCE PROGRAMS, UNITED STATES DEPARTMENT OF LABOR, Plaintiff, v. ORACLE AMERICA, INC., Defendant.	OALJ Case No. 2017-OFC-00006 OFCCP No. R00192699 **DECLARATION OF JONATHAN RIDDELL IN SUPPORT OF DEFENDANT ORACLE AMERICA, INC.'S MOTION TO SEAL PORTIONS OF THE EVIDENCE SUBMITTED IN SUPPORT OF OFCCP'S OPPOSITION TO ORACLE'S MOTION FOR PROTECTIVE ORDER** **EXHIBITS VOLUME 2 OF 2**

DECLARATION OF RIDDELL ISO MOTION TO SEAL

EXHIBIT D

EXHIBIT G

EXHIBIT G

EXPERT REBUTTAL REPORT OF ALI SAAD, Ph.D.

In the matter of
Office of Federal Contract Compliance Programs,
United States Department of Labor, Plaintiff,
v.
Oracle America, Inc., Defendant.

OALJ Case No. 2017-OFC-00006

August 2019

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ASSIGNMENT

1. I was retained by counsel for defendant Oracle America, Inc. ("Oracle") in my capacity as a labor economist to respond to the expert report by Dr. Janice Madden dated July 19, 2019 in the matter of *Office of Federal Contract Compliance Programs, United States Department of Labor, Plaintiff, v. Oracle America, Inc., Defendant*. Dr. Madden's report was submitted in support of OFCCP's contention that "Oracle discriminated against women, Asians, and African-Americans or Blacks in compensation."[1] The OFCCP further alleges that "Oracle paid women and Asians less at hire, either by suppressing their pay relative to other employees in the same or comparable job, or by hiring them for lower-paid jobs," and that Oracle "place[s] [female, Asian, and Black or African-American] employees in lower global career levels."[2] To address these allegations from a statistical perspective I was provided with electronic human resources data, payroll data, performance review system data, and other documents related to Oracle, including depositions and company policy documents. I have been provided with Dr. Madden's backup materials and have been able to replicate and evaluate her analyses. My report responds to the analyses submitted by Dr. Madden. I may supplement this report at a later date if additional relevant information is made available to me.

[1] Second Amended Complaint, in the matter of *Office of Federal Contract Compliance Programs, United States Department of Labor, Plaintiff, v. Oracle America Inc., Defendant*, United States Department of Labor, Office of Administrative Law Judges, OALJ Case No. 2017-OFC-00006 OFCCP No. R00192699, March 8, 2019, paragraph 11.
[2] SAC, paragraph 22.

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QUALIFICATIONS

2. I am the Managing Partner of Resolution Economics Group LLC, a firm whose activities include performing economic and statistical analyses in connection with litigation and other consulting matters. Before beginning my consulting career I was a tenure track member of the faculty of the economics and finance department at Baruch College of The City University of New York. While there I taught labor economics, micro and macroeconomics, econometrics, and economic history. In connection with my consulting, I have extensive experience providing statistical and economic analyses in connection with company pay equity studies, evaluations of compensation systems, and class action employment cases, including employment discrimination and wage and hour matters. I have also published and lectured on these topics. A consistent focus of my work has involved economic and statistical analyses related to claims of systemic gender discrimination. In the litigation context, I have significant experience in analyzing complex data for the purpose of assisting counsel in evaluating both class certification and liability, including in compensation discrimination cases. I hold a Ph.D. in Economics from The University of Chicago, and a B.A. in History and Economics from The University of Pennsylvania. I have been qualified as an expert witness in both Federal and State Courts. My resume, including all publications and testimony over the past four years, is provided as Attachment A. My firm bills for my services at my current hourly rate of $750 per hour.

DATA AND DOCUMENTS

3. I was provided by Counsel with databases, depositions, and other documents. In addition to computerized human resource databases, the information provided also includes a variety of computerized textual documents that supply detailed company- and employee-specific information such as: 4,517 job requisitions that provide detailed information about the types of skills and experience relevant to different posted positions under the same standard job title; 4,226 resumes that list specific educational and employment experiences of employees; 1,584 narrative descriptions that managers provide to explain the reasons for their pay and promotion decisions, including starting pay; and 19,972 performance appraisals and self-appraisals that describe the work performed by different employees. In addition, I collected publicly available data, and relied on additional secondary materials. I have also received Dr. Madden's July 2019 report and the back-up materials produced with that report. In connection with my July 2019 report, I listed in Attachment B the materials I had been provided to date for consideration in connection with this case. Additional materials provided for my consideration since that date in connection with this rebuttal report are listed in Attachment B.

SUMMARY OF FINDINGS

4. The only way that Dr. Madden reaches a conclusion that Oracle pays women, Asians, and African-Americans less than it should is because she *assumes* with no empirical support that Oracle specific pay related factors like jobs held and the nature of the work employees are engaged in should be excluded from a pay analysis because of the possibility that they too are the outcome of biased decision making by Oracle managers. As a result, in her primary pay analyses, Dr. Madden only controls for differences in age, educational level and time since hire at Oracle. The exclusion of all Oracle related job and work area factors from the analysis of pay

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differences by gender and race is based only on an *assumption*, not on any analysis performed by Dr. Madden, an assumption which falls apart when subjected to empirical scrutiny.

5. In addition, the variables Dr. Madden does include to measure pre-Oracle work experience and education are poor proxies that ignore the relevance of an employee's background to the work he or she performs at Oracle. Given Dr. Madden's approach, which does not by design include any pay related factors focused on the jobs and the work employees do at Oracle, she should have focused especially hard on obtaining the most complete and accurate information related to each employee's *pre-Oracle* characteristics. Instead of doing this, she simply measured age, years at Oracle, and level of education, but did not use the details of each person's prior work history or the type of education. Finally, when Dr. Madden does insert several Oracle variables into her pay analyses in order to in her words "assess the mechanisms by which discriminatory compensation occurs,"[3] they are insufficient measures that fail to allow comparisons between employees performing similar work. Because of these flaws, Dr. Madden's analyses do not support any inferences of pay discrimination at Oracle.

6. Dr. Madden's *assumed* bias by Oracle's many managers in job "placement," *assumed* bias in promotions, and "identified" pay bias that results in her statistical analysis when Oracle job- and work-related variables are excluded due to these assumptions all disappears once her predicate assumptions are actually tested. There is no empirical evidence of bias in how employees come to hold the specific jobs and positions they occupy at Oracle, and the only way Dr. Madden obtains her adverse gender and race pay results is by omitting Oracle variables from her analysis. In my initial report filed July 19, 2019 and in this further report, I conduct analyses that show that none of the biased outcomes that Dr. Madden assumes are observed in the data. In addition, the one analysis Dr. Madden performs of other Oracle practices does not show any bias

[3] Madden July 2019 report, p. 8

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in that practice. I then use the job- and work-related factors that Dr. Madden omits to more closely compare employees with similar skills doing similar work from a labor economics perspective and find no pattern of statistically significant pay differences.

7. In my previous report I responded to positions taken by the OFCCP in their March 8, 2019 Second Amended Complaint ("SAC") and March 11, 2016 Notice of Violation ("NOV"). In the SAC and NOV, the OFCCP purported to conduct what is typically referred to as a "pay equity" analysis. In other words, they did not assume that variables related to the work performed by employees at Oracle should be left out of their model – they included variables found in the Oracle data for standard job title, career level, and so on, as part of their attempt to compare the pay of employees performing similar work. In addition, in both the SAC and the NOV, the OFCCP conducted separate analyses by job function, presumably because they believe that there are sufficient differences between the business aspects of these three functions that the variables in their models would not adequately capture such differences and could bias their findings. In my initial report, I focused on the failure of the OFCCP to include the correct measures of many of these variables, and the omission of other variables that they should have included even within their function-wide, aggregated models.

8. Dr. Madden has not performed an analysis that is anything like that of the OFCCP. Dr. Madden has lumped all employees into one analysis, and has not taken into account any variables about work performed at Oracle in reaching her conclusions that Oracle pays women, Asians, and African-Americans less than it should. Dr. Madden's pay analyses do not by design compare employees who are similarly situated from a labor economics perspective with respect to the work they perform because of an *assumption* that Oracle *might* have exercised gender and race bias in the "assignment," in her words, of employees into jobs and other aspects of the work

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at Oracle. Consequently, Dr. Madden does not include any variables in her analyses that identify what jobs people hold, what type of work they perform, or anything else regarding the details of their work at Oracle. Instead, she only compares employees who share the same age, education level, and years since hire at Oracle.[4] As I noted above, Dr. Madden does include several Oracle variables in portions of her analysis, but only does so in order to identify what she claims are particular sources of the overall pay differences. For example, when Dr. Madden attempts to control for the jobs people are in, she observes the reduction in the size of the pay gap, and states that this reduction is the amount by which Oracle's biased "assignment" of jobs contributes to the overall pay gap identified when only education, age and Oracle years of tenure are taken into account. The problem is, Dr. Madden does no analysis of how jobs are "assigned," and simply states that if Oracle is alleged to have pay disparities, it must be the case they also have job assignment disparities, and since that would flow through pay, the analyst must omit the job factors or variables from the pay analysis. Of course, this is circular reasoning, and since it is subject to empirical testing with the data provided, Dr. Madden could have tested for the job assignment issue and then decided if it was appropriate to include job in her pay analysis. She did not do this. Her untested predicate assumption is that there can be no possible reason why groups of employees differ in what jobs they hold or what work they perform other than discrimination by Oracle managers against members of particular groups.

9. Based on her statistical models, Dr. Madden computed an aggregate pay shortfall of over $700 million that she claims Oracle owes its employees. However, Dr. Madden's damages figures are based directly on the flawed statistical pay difference models she runs. Because these

[4] Note that this statement is with respect to what I discuss below regarding Dr. Madden's "column (5)" analysis which controls only for age, educational level and Oracle tenure, and from which she draws her conclusions regarding the full extent of Oracle's shortfalls in pay to its female and minority employees.

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analyses are neither sound nor reliable, they do not establish any pattern or practice of pay discrimination at Oracle, and they do not provide any basis for computation of damages. My analysis indicates no pay shortfalls by protected groups, and thus provide no basis for OFCCP's formulaic computation of damages.

CRITIQUE OF DR. MADDEN'S ANALYSIS

10. I begin this report with an in-depth critique of Dr. Madden's general approach to studying pay outcomes at Oracle and her econometric implementation of the pay and promotion models. In a subsequent section of this report, I then present my results that compare employees who are more similarly situated in terms of their skills, responsibilities and the work they perform. I perform these analyses on the assumption that the levels of aggregation are appropriate, an assumption I differed with in my initial report. I also use the Oracle variables as provided, again, in spite of previously expressed reservations I have about, for example, the usefulness of standard job title.

There is no basis for excluding variables regarding the work employees at Oracle perform from a study of pay discrimination

11. Dr. Madden reaches her statistical conclusions of large pay differences primarily because she asserts that no variables related to the work employees at Oracle actually perform – *e.g.*, standard job title, organization, career level, or even whether an employee is a manager or individual contributor – can be included in pay analyses designed to evaluate alleged pay discrimination, due simply to the *possibility* that these variables could be tainted by discrimination. Consequently Dr. Madden's conclusions related to pay do not account for differences in what jobs employees hold, what projects they work on, or any other aspects of

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their work at Oracle (other than just time since hire).[5] Dr. Madden suggests that her approach is standard in labor economics, when in fact it represents an extreme and untenable way of studying pay outcomes in a specific company about which you have large amounts of data regarding the nature of the work employees are engaged in.[6]

12. Dr. Madden's approach to evaluating pay discrimination at Oracle is inconsistent with the approach she has used elsewhere, including in evaluating pay at her own long-time employer. She and other members of the University of Pennsylvania Gender Equity Committee conducted a study on the University's data that, unlike her report here, used an approach that utilized detailed company variables to take into account details of the work being performed. There, they estimated *separate* models by rank (e.g., Assistant, Associate, Full Professor) and by department/school (e.g., Arts and Sciences, Humanities, Social Sciences, Wharton, Law School, etc.). The models further controlled for degree and time since degree was earned, *as well as in some cases whether the specific department was "high-pay, low-pay, or medium-pay."* The stated reason for introducing these controls was to account for the fact that "[t]here are several reasons why salary levels differ among faculty members. If one faculty member has a more

[5] As noted above and further described below, in Dr. Madden's tables 1(a) through 3(c), she inserts Oracle specific variables for exempt status, "job descriptor" (a variable she created by grouping together a number of standard job titles that she considers to be related), whether an employee is a manager or not, and global career level. However, Dr. Madden does *not* insert these variables in order to more similarly situate employees for pay comparisons, but simply to allow her to identify the extent of what she views as "discrimination" from Oracle's assumed biased "assignment" of exempt status, biased "assignment" of jobs, etc. Her opinion regarding the true pay differentials for each protected group is not based on analyses after any of these work and job-specific variables are included, as she emphasizes in her report.

[6] Note that in certain of her analyses, Dr. Madden inexplicably changed the Oracle variables she added after her base "human capital" variables. For example, in the stock award tables (e.g., Table 1(g)), she added "performance rating" and removed "management control." Regardless of the type of analysis, Dr. Madden always used age, educational level, race/sex, and time at Oracle as the base common variables, and she used these variables as the only variables that should be inserted because of her assumption regarding Oracle's possible behavior with respect to any variables related to the actual work setting of employees once employed at Oracle.

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highly compensated degree, or more experience, or has a specialty that other universities or the broader labor market compensates more highly, he or she is more likely to receive a higher salary."[7] There is no reason to believe this is any different at Oracle than it is at the University of Pennsylvania. And it is an empirical matter as to whether such factors correlate to gender or race, not a matter for assumption that they do not or should not.

13. Nonetheless, Dr. Madden's opinion in this case appears to be that *if* Oracle was "steering" protected groups into lower paying positions, or denying them promotions to higher level jobs, rather than hiring applicants into jobs for which they apply and that their specific skills sets warranted, then it would be wrong to control for any job characteristics in a pay model designed to study overall pay outcomes for the protected groups. However, Dr. Madden only *asserts* that this "steering" takes place, rather than showing that it does. With respect to "steering" at the time of hire, I described in my previous report (Saad, July 2019 Report, paragraphs 147-156) and I elaborate on in this report how data produced in this case identifying the specific posted job requisitions to which applicants responded and into which individuals were hired contradicts her assumption that Oracle "steers" employees into different jobs. The job requisition and hiring data show that women, Asians, and African-Americans get the positions, career levels and work areas to which they apply at fully expected rates, and that when they are hired into a global career level either above or below the one originally associated with the posted position, it is at rates that are statistically consistent with expectations and do not systematically differ by race or gender.

14. With respect to Dr. Madden's promotion analysis, which does not appear in the body of

[7] The Gender Equity Report, Executive Summary, p. V, and p. V, footnote 1. ALMANAC SUPPLEMENT December 4, 2001 (https://almanac.upenn.edu/archive/v48pdf/011204/GenderEquity.pdf).

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her report, but in an appendix, she reported results limited to two career levels for one of the three protected groups, and claims to show that women were under-promoted out of those levels. However, when I examine her analysis by year (to take changing economic conditions into account), her promotion model shows that women are promoted at expected rates in all six years she analyzed for women moving from IC3, and in five of the six years she analyzed for women moving from IC4. Furthermore, her own model showed *no* statistical under-promotion of women in any other level – a fact she omitted from her report. In addition, her computer program can be adapted to study promotions for Asians and African-Americans, though she does not appear to have done so. Her model shows there are no statistically significant adverse promotion outcomes for Asians or African-Americans in any year, in any level. These results are inconsistent with her claim that there is any gender or race "disparity in the assignment of global career levels."[8]

15. Taken as a whole, these results clearly contradict Dr. Madden's assumption that all variables related to work performed at Oracle should be excluded from the pay analysis. In fact, the "possibility" she posits that these variables are tainted is contradicted by the fact that, according to the data, they are not. And when these job and work variables are added to the analysis of pay, there is no pay shortfall experienced by women, Asians, or African-Americans at Oracle. Thus, there is consistency across outcomes with respect to hires, promotions, and pay, in that when all are analyzed more appropriately, there is no pattern of adverse outcomes for women, Asians, or African-Americans.

16. It is only because Dr. Madden *omits* indicators of work performed from analysis because of an *assumption* that promotions and hires/placement are biased that she gets "consistent" results. She assumes "taint" and thus bias in Oracle "assignments", assumes taint and thus bias

[8] Madden July 2019 report, p. 51.

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in promotions, which she uses to justify not controlling for these Oracle factors in the pay analysis, which then leads her to a "finding" of a pay disparity. The problem is that her story's apparent consistency breaks down, because her assumptions of bias in two practices (how job held/work area is determined, and promotions) that justifies leaving out important variables when studying a third practice (pay) are easily rebutted by examining the actual data. Dr. Madden's opinion collapses when her assumptions are tested empirically, with the result being a consistent set of conclusions: Oracle does not exhibit bias in 1) hires into jobs to which individuals applied; 2) promotion across career levels; or 3) "pay equity," when (more accurate) work- and job-specific variables are included in the pay analysis.

Dr. Madden's analogy to clinical trials research is incorrect and misleading

17. In an effort to justify her reliance on *assumptions* that omitting work- and job-specific variables are not a concern in an analysis of company discrimination in pay, Dr. Madden relies on an erroneous analogy to clinical trial experiments. She uses the analogy to justify not studying the assumptions on which her entire model relies, when nothing about studying actual pay in actual companies is like a controlled clinical trial experiment under laboratory conditions. And she claims that she is justified in omitting further variables based on her assumption – again untested and unproven – that those variables should not differ, on average, between men and women, or white and minority employees, within this specific population.[9] A scientific approach requires testing, which Dr. Madden does not do, rather than simply asserting such claims.

Dr. Madden does not correctly measure the education and experience variables she does include

18. Dr. Madden's assumption based approach precludes using Oracle variables. Thus, it is

[9] Madden July 2019 report, p. 46.

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especially crucial for her models to capture the breadth and depth of employee education and prior experience. Yet she includes only crude proxies for both education and experience, the key "human capital" variables in her model. She includes only educational level, and not major or specialization.[10] She also only uses age to measure pre Oracle experience. She does not distinguish between prior experience in areas of interest to Oracle and to other companies competing directly for these employees versus prior experience in IT departments of non-competitors like Bank of America. Her analysis lumps time worked at an Oracle America, Inc. international affiliate or a company later acquired by Oracle America, Inc. in with all other "prior" experience even though those employees are working on products and services highly and specifically relevant to Oracle. She also does not account for time spent in a particular level, job, or position at Oracle, which would take into account the fact that someone in a position for five years has had a lot more time to learn the job than someone who just moved into that position. She also does not distinguish between time worked and time away from the labor market prior to arriving at Oracle. Due to these failures, her "human capital" variables do not accurately measure differences between employees or similarly situate them from a labor economics perspective, which she concedes one should do with respect to prior experience. These failures make her "human capital" analyses unreliable and inadequate to support any conclusions about the presence or absence of gender- or race-based pay differences among comparable employees. Dr. Madden claims that differences of the type I have described are "presumed" not to exist, rather than taking the data as it is. It is not a matter of presumption as to

[10] Again, this is unlike her analysis of pay at the University of Pennsylvania which distinguished between "high" pay and "low" pay departments, and the business school and law school from Humanities and the Social Sciences. That report stated that "[i]f one faculty member has a more highly compensated degree, or more experience, **or has a specialty that other universities or the broader labor market compensates more highly**, he or she is more likely to receive a higher salary." (Emphasis added; Gender Equity Report, 2001, p. V).

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whether men and women in this specific group of employees, for example, have differently distributed prior work histories and educational experiences – it is a set of facts that accompany these workers as they arrive to Oracle. Assumptions are not warranted, nor are they needed when faced with the actual data.

19. As an empirical matter, Dr. Madden's measure of education is missing for almost 60% of the employees, but Dr. Madden deemed that somehow acceptable even though her education variable does not meaningfully distinguish among over half of the individuals she studied.[11] Simply estimating her models over the population for whom education was recorded (as she does in Tables 1(b), 1(e), 2(b) and 2(e)) is not a suitable solution because the education data is not missing randomly by gender or race. Women and whites are statistically significantly less likely to have education information than men or Asians, meaning these models are estimated on a biased subsample of the population and are not representative.[12]

Dr. Madden in effect controls only for job title when she does add Oracle variables to her model, which is inadequate to group employees performing similar work

20. After using the handful of "human capital" variables in columns 1 through 5 of her Tables 1 through 3 – which, as described above, are fundamentally mis-measured – Dr. Madden proceeds to introduce what she calls "endogenous" variables[13] (variables she assumes are

[11] For the entire population of 8,679 employees (anyone who worked in the 3 job functions at HQCA in 2013-2018), 58.0% are missing education information in the field Dr. Madden analyzed. In Dr. Madden's incumbent pay population, the percentage missing ranges from 53.5% to 66.5% depending on the year.

[12] The differences between white and African-American employees are not statistically significantly different. Also, note that missing education data is quite common in company electronic human resource system databases.

[13] In her report she describes these as follows: "Clearly, the characteristics which employees have determined and Oracle does not determine—such as race, ethnicity, gender, age, time at Oracle, and education—and which are also well known to affect compensation, are appropriate to use as controls in the analysis of compensation discrimination. Such characteristics are "exogenous" as they are not determined by Oracle's policies or decisions about individual employees. The

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entirely subject to Oracle's control and thus tainted) into her statistical models: exempt/non-exempt status, a variable she created called "job descriptor" (like software developer or technical writer), whether an individual is a manager (M) or individual contributor (IC), and global career level. Remarkably, Dr. Madden refers to employees sharing only a job descriptor to be in the same job: "The sixth column, then, shows the gender differentials in compensation for persons of the same age, degree level, experience at Oracle and ***in the same jobs*** within race and ethnic groups."[14] By that logic, a Software Developer 1 is in the "same job" as a Software Developer 6. According to Oracle documentation, however, someone in a level 1 job contributes by "following directions," whereas a level 6 employee in the same career path is a leader who "[m]anages and plans implementation of company policy for achieving business goals."[15] Such employees are not doing similar work.

21. By column 8 in her tables, which adds global career level and whether someone is a manager or individual contributor, Dr. Madden is in effect controlling for standard job title.[16] This roughly approximates the analyses the OFCCP performed in support of the NOV and SAC.

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preferred analyses of discrimination are those that measure the extent of discrimination using only exogenous employee characteristics as controls in the analyses.

"The values of other characteristics that influence compensation—such as job and management responsibilities, or global career level—are set by Oracle in evaluating individual employees and the values of such characteristics are likely to be affected if there were discrimination. Such characteristics are "endogenous" as they are determined by Oracle's policies or decisions about individual employees. Endogenous characteristics cannot be used in any analyses of whether discrimination has occurred. Endogenous characteristics may be included in an analysis of discrimination, however, in order to assess the mechanisms by which discriminatory compensation occurs." (Madden report, p. 8)

[14] Emphasis added; Madden report, p. 16.

[15] ORACLE_HQCA_0000022906 Career Level Guidelines Matrix Oracle.xls. See also paragraph 41 of my initial report.

[16] If instead of adding the variables separately as in columns 6, 7 and 8 of her tables, I instead simply add standard job title after column 5, the coefficients and associated t-statistics are virtually unchanged. For African-Americans in 2013 and 2017, the results become more negative.

As I noted in my previous report, however, standard job title alone does not similarly situate employees. For that, the analyst needs more information about the products being worked on and the associated skills being required. For example, a Software Developer 4 position posted in the "Real World Performance" organization called for "Oracle Database skills," a "strong SQL background," and a "working knowledge" of how to manipulate databases quickly.[17] The same standard job title – Software Developer 4 – but in the Oracle Business Intelligence organization required "fluency in C++," and experience "improving performance and scalability of server products."[18] Again, this attention to specialization is not unlike the University of Pennsylvania pay equity study that distinguished between "more highly compensated degree[s]" or "has a specialty that other universities or the broader labor market compensates more highly." In short, in columns 6 through 8, Dr. Madden is not, as she claims, examining the mechanisms through which discrimination occurs but rather she is falling short of an analysis that would compare pay among employees doing similar work.

There are a number of other errors in Dr. Madden's measurement of the variables she does include in her analysis

22. There are additional errors in Dr. Madden's work. Her measure of total compensation is incorrect because she relies on Medicare wages which include any stock awards cashed in that year that may have been awarded in some other year, and exclude stock awards in a year being analyzed that were not cashed in that year (Saad July 2019 Report paragraph 105). She also inappropriately aggregates across job functions. The original NOV results showed that (using the OFCCP's model) just 3 of 16 job functions had possible pay issues, which suggests that not

[17] iRec Vacancy IRC1543641 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).
[18] iRec Vacancy IRC2217752 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

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all job functions are alike or should be analyzed together. Thus, there is no justification for aggregating across the three job functions studied here (and indeed, the OFCCP did not do so in their analyses supporting the NOV and SAC). Referring to analysis contained in my initial report, correcting these errors, and, introducing additional indicators of type of work performed (such as organization) and level of technical skill into the statistical models in order to compare employees who are more similar with respect to their work circumstances, indicates no pattern of pay outcomes adverse to women, Asians, or African-Americans. (Saad July 2019 Report paragraphs 121-125).

23. As described in the balance of this report, it is my opinion as a labor economist that Dr. Madden's conclusions are scientifically unsound and highly unreliable. They are based on a distorted version of what she refers to as the human capital model. Dr. Madden's analyses do not support any inference of systemic pay discrimination against women, Asians, or African-Americans and do not furnish a scientific basis to reach the sweeping conclusions she asserts.

Dr. Madden adopts an overly simplistic version of the human capital model, makes unsupported simplifying assumptions, and relies upon flawed proxies for productivity to generate her results

24. As I noted in my initial report (paragraphs 94 to 97), after conducting a statistical analysis of data for all Oracle employees in the 16 job functions represented at its Redwood Shores Headquarters location as of January 1, 2014, the OFCCP chose to bring claims of discrimination by Oracle against women in just three of those 16 job functions (PRODEV, INFTECH, SUPPORT) and for Asians and African-Americans in only one job function (PRODEV). In other words, they did not find evidence of adverse outcomes for women, Asians, or African-Americans in a majority of the functions they studied. Nonetheless, their theory that pay outcomes are the result of a standard practice at Oracle posits a single set of common pay

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policies for starting pay and wage growth thereafter. No explanation of why those policies do not have comprehensive adverse impact is offered. In my initial report, I pointed out this inconsistency (paragraph 95). I also pointed out that the analyses the OFCCP relied upon in the SAC failed to appropriately control for the skills of employees or the nature of the work they were engaged in, such that their statistical comparisons did not serve to similarly situate employees from a labor economics perspective (paragraphs 108-119). As such it was and remains my opinion that one cannot make any of the inferences of discrimination that OFCCP drew based on those analyses.

25. The OFCCP has now asked its outside expert Dr. Janice Madden to analyze data and information produced in this case. Dr. Madden's report is essentially focused entirely on pay with a short and highly flawed analysis of starting pay and a single appendix table that deals with promotion. Tables 1(a) through 3(c) share a similar construction. Each table focuses on a particular target population (all employees, those employees with education data among the files/fields she reviewed, etc.) and summarizes a series of sequentially constructed regression models studying a particular pay metric (total pay, base pay, stock, etc.). Table set 1 relates to gender, Table set 2 to Asians, and Table set 3 to African-Americans. The different tables within each set are for a focus on total pay or base pay, or limit the population analyzed in various ways.

26. Each of the three sets of tables starts by inserting only the protected characteristic as a variable to explain pay. The result is shown in column (1) in each of these tables. The only "control" in the first regression model on each table is the protected characteristic, and as such, all of the column (1) models are simple comparisons of the overall average pay for all women compared to all men, or all Asians compared to whites, etc. After column (1), Dr. Madden

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proceeds to sequentially add variables to the regression model. Starting with Table 1(a) as an example, which focuses on women and uses Medicare wages as the dependent variable, column (2) adds a race variable to the gender model in column (1). This is different from OFCCP's approach, which left race out of the gender model, and gender out of race models. Column (3) adds age, column (4) adds education level, and column (5) adds time since hire at Oracle. Note that at each step, all previously added variables are retained, such that the model in column (5) has gender, race, age, education level, and time since hire at Oracle. These are all variables which Dr. Madden states are "exogenous" to Oracle, meaning not under the control of Oracle. Dr. Madden claims that for purposes of studying pay at Oracle, her variables fully capture the relevant differences between employees in their productive attributes. Her opinions regarding the extent of the difference in pay at Oracle for each of the protected groups is based on Column (5) – that is, the pay differences are assessed taking into account only the "exogenous" variables considered by Dr. Madden.

27. Columns 6, 7 and 8 add exempt/non-exempt plus job descriptor, "management control", and global career level, respectively. By labeling these variables "endogenous," Dr. Madden is essentially arguing that Oracle's hundreds of managers are making systematic and biased decisions against thousands of employees.[19] Dr. Madden does not acknowledge that the skills, experience or expertise that a worker brought with him or her to Oracle could influence, for example, which job an employee occupies, and instead is arguing that if there turns out to be any difference in the job distribution within Oracle, and the result of that is that women, Asians or African-Americans earn less, then this distribution must somehow have been forced upon these

[19] As detailed in my initial report, in paragraphs 98 to 103, OFCCP's models as applied to the data suggest that different Oracle supervisors make different decisions regarding pay for women and non-white employees, undermining the OFCCP's hypotheses about uniform decision-making across the company.

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protected groups by Oracle.

28. Comparing employees who are the same when measured only against Dr. Madden's statistical controls of age, education level, and time since hire at Oracle underscores just how inadequate these measures are. Consider the employees with Person IDs 175834 and 185819. According to Dr. Madden's column 5 regression model, they should earn the same, because both are white men[20] who were [redacted] years old, had both worked at Oracle for 19.9 years, and had "unknown" or "missing" education levels according to Dr. Madden's education variable.[21] Looking beyond Dr. Madden's "human capital" education level and age variables, one sees that the first of these employees was in 2017 a [redacted] with 2017 Medicare Earnings (Madden's measure of total compensation)[22] [redacted] The other employee was a [redacted], with Medicare Earnings of [redacted]. I do not have their resumes, but according to their publicly available LinkedIn profiles, Employee 175834 has a B.A. in [redacted] from San Francisco State University, and his only other listed work experience was owning a [redacted].[23] Employee 185819 lists having attended the New School but does not indicate the degree earned, and indicates over 16 years of experience working as a [redacted]

[20] Note that these employees have the same race and gender, such that neither attribute can explain any pay differences between them.

[21] As noted above, Dr. Madden's education control is coded as "MISSING" for almost 60% of the data – i.e., it is the most common value used in her analysis. This essentially means that one of the only three variables Dr. Madden did include contains very little information that could actually be used to distinguish among employees in her model.

[22] I have explained the problems with reliance on Medicare Earnings as a measure of total compensation, and do so again below. July 2019 Report paragraph 105.

[23] LinkedIn: [redacted] (https://www.linkedin.com/in/[redacted]), accessed on August 12, 2019.

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[redacted].[24]

Example 1 of Employees Dr. Madden's Model Considers Similar Year-End 2017		
Employee	**Person ID: 175834**	**Person ID: 185819**
Pay Information		
Base Pay	[redacted]	[redacted]
Bonus		
Stock		
Medicare Earnings		
Total Compensation (Base Pay + Bonus + Stock)		
"Exogenous Variables" from Dr. Madden's Model		
Gender	Male	Male
Ethnicity	White (Not Hispanic or Latino)	White (Not Hispanic or Latino)
Age (End of 2017)	[redacted]	[redacted]
Madden's Highest Education	Unknown	Unknown
Madden's Oracle Tenure (in years)	19.9	19.9
"Endogenous Variables" from Dr. Madden's Model		
FLSA Status	Exempt	Exempt
Job Descriptor	PROGRAM MGMT-PRODDEV	PRODUCT DEVELOPMENT
Global Career Level	[redacted]	[redacted]

[24] LinkedIn: [redacted] (https://www.linkedin.com/in/[redacted]), accessed on August 12, 2019.

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Additional Variables Ignored by Dr. Madden		
Job Title	[redacted]	[redacted]
Organization Name	[redacted]	[redacted]
Ever Received a Patent Bonus	No	Yes
Time in Job Title (in years)	2.8	9.7
Discretionary Job Title	[redacted]	[redacted]
Information from LinkedIn		
Education	BA in [redacted], San Francisco State University	The New School, no degree listed
Previous Roles	[redacted]: Owner	[redacted]

29. Consider Person ID 891214836 (male) and Person ID 889964570 (female). Both have the same level of education according to the variable used by Dr. Madden (master's degree), are the same age as of year-end 2016 ([redacted] years old), are the same race (Asian), and share the same amount of time since hire at Oracle (about 5.5 years). The man was in a [redacted] role with [redacted] in 2016 Medicare Earnings, and the woman was in a [redacted] role with [redacted] in 2016 Medicare Earnings. Dr. Madden's approach would again predict the same earnings for each – and attribute any pay difference between them to an inference of gender discrimination by Oracle – and would further insist that the enormous difference in their jobs has nothing to do with the employees and only has to do with Oracle's "assignments." This is obviously an absurd suggestion, especially given the information that was produced in this case specific to them. Their resumes point to systematic *prior* relevant skill and experience differences that Dr. Madden's models do not account for, and given her decision not to include Oracle variables, her failure to structure her analysis using these

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details is a glaring omission. The female's resume shows that she has a Master's degree in [redacted] and an M.B.A., and her work history includes an [redacted]-year gap between working at [redacted] and Oracle, meaning that she was not in the labor market gaining additional work experience for that period of time.[25] The male holds a Masters of [redacted], a [redacted] and a Bachelor of [redacted] degree, and had 18 years of continuous employment in the technology industry when he applied to Oracle.[26]

Example 2 of Employees Dr. Madden's Model Considers Similar **Year-End 2016**		
Employee	**Person ID: 891214836**	**Person ID: 889964570**
Pay Information		
Base Pay	[redacted]	[redacted]
Bonus		
Stock		
Medicare		
Total Compensation (Base Pay + Bonus + Stock)		
"Exogenous Variables" from Dr. Madden's Model		
Gender	Male	Female
Ethnicity	Asian	Asian
Age (End of 2017)	[redacted]	[redacted]
Madden's Highest Education	Masters	Masters
Madden's Oracle Tenure (in years)	5.3	5.9

[25] ORACLE_HQCA_0000302429.
[26] ORACLE_HQCA_0000083484.

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"Endogenous Variables" from Dr. Madden's Model		
FLSA Status	Exempt	Exempt
Job Descriptor	SOFTWARE DEVELOPMENT	PRODUCT MGMT/STRATEGY-PRODDEV
Global Career Level	[redacted]	[redacted]
Job Function	PRODEV	PRODEV
Additional Variables Ignored by Dr. Madden		
Job Title	[redacted]	[redacted]
Organization Name	[redacted]	[redacted]
Ever Received a Patent Bonus	Yes	No
Total Oracle Years	5.3	5.9
Time in Job Title (in years)	2.7	1.2
Education Major	Technology	Business, MIS
Discretionary Job Title	[redacted]	[redacted]
Information from Resumes		
Education	M.Tech., National Institute of Technology [redacted] India [redacted]., Andhra University, India	MBA, University of Houston, Texas M.A. (major in [redacted] from Madras University, India
Certifications	0	4
Number of Patents	1	0
Awards	Multiple Appreciation Awards from [redacted] PBG and Delivery Groups for architecture guidance for strategic customer solutions using [redacted] products; Significant Product Architecture Contribution award for development of [redacted] Service Management Suite & Improvement of [redacted] Products Operability Initiatives; Multiple Product Innovation Recognition Awards at [redacted]; Best Product Quality Contributor Award at [redacted]; Appreciation award for Technical Marketing of Games	Dean's Academic Excellence Award

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	Management System for 20th SEA Games, [redacted]; Technology Innovation award for Implementation of [redacted] at [redacted]	
Previous Roles	[redacted] CRM Chief Architect (Sr. Director role), CTO Office; [redacted] Chief Architect (Director Role); [redacted] Principal Software Architect; [redacted]: Prinicpal Engineer; [redacted]: Senior Consultant; [redacted] Project Manager; [redacted].: Solutions Architect; [redacted]: Senior Engineer	Oracle: [redacted] Certified Consultant [redacted] Systems: [redacted] Customer Certified Consultant [redacted] LLP: Consultant-CRM Practice
Requisition Information		
iREC Job Posting Description	As a Senior Director of the software engineering division, you will apply your extensive knowledge of software architecture to manage software development tasks associated with developing, debugging or designing software applications, operating systems and databases according to current and future design specifications. Build enhancements within an existing software architecture and envision improvements to the architecture. Directs and ensures the implementation of operational policies through subordinate managers Interacts internally and externally with executive management involving negotiation of difficult matters to influence policy. Functional expertise and broad company knowledge. Demonstrated leadership and people management skills. Strong communication skills, analytical skills, thorough understanding of product development.[27]	Lead a team that acts as the central resource and driving force for the design, process, manufacturing, test, quality and marketing of product(s) as they move from conception to distribution. Organize interdepartmental activities ensuring completion of the project/product on schedule and within budget. As a member of the product development division, you will analyze and integrate external customer specifications. Suggest and justify product directions and specifications. Specify, design and implement moderate changes to existing software architecture. Build new products and development tools. Build and execute unit tests and unit test plans. Review integration and regression test plans created by QA. Communicate with QA and porting engineering to discuss major changes to functionality. [28]

[27] iRec Vacancy IRC1579651 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).
[28] iRec Vacancy IRC2909549 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

30. As another example, consider Person ID 888762142 (female) and Person ID 10334044 (male). Both have BE and MS degrees in computer science, are similar in age, are the same race (Asian), and share the same amount of time since hire at Oracle (about 6.5 years). Her Medicare Wages were [redacted] while he earned [redacted] Dr. Madden's approach would again predict the same earnings for each. Their resumes[29] point to systematic *prior* relevant skill and experience differences that Dr. Madden's models do not account for, including an additional 8.9 years of Oracle experience for her once her work at a firm acquired by Oracle is accounted for. Their job responsibilities also markedly differ. Her job responsibilities include creation of division strategy and business success; he develops and designs software. None of this relevant and available material is included in Dr. Madden's model and yet she argues that her model compares employees who have similar skills and responsibilities and perform similar work. Simply handwaving away any potential group differences in these characteristics that drive pay differences, as Dr. Madden does, rather than test the strength of that assumption is scientifically unjustifiable.

[29] ORACLE_HQCA_0000082603 and ORACLE_HQCA_0000083064.

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Example 3 of Employees Dr. Madden's Model Considers Similar Year-End 2014		
Employee	**Person ID: 888762142**	**Person ID: 10334044**
Pay Information		
Base Pay	[redacted]	[redacted]
Bonus		
Stock		
Medicare Wages		
Total Compensation (Base Pay + Bonus + Stock)		
"Exogenous Variables" from Dr. Madden's Model		
Gender	Female	Male
Ethnicity	Asian	Asian
Age (End of 2017)	[redacted]	[redacted]
Madden's Highest Education	Masters	Masters
Madden's Oracle Tenure (in years)	6.2	6.7
"Endogenous Variables" from Dr. Madden's Model		
FLSA Status	Exempt	Exempt
Job Descriptor	SOFTWARE DEVELOPMENT	SOFTWARE DEVELOPMENT
Global Career Level	[redacted]	[redacted]
Variables from Dr. Saad's Model		
Job Title	[redacted]	[redacted]
Organization Name	[redacted]	[redacted]
Ever Received a Patent Bonus	Yes	No
Total Oracle Years	15.1	6.7
Time in Job Title (in years)	6.2	4.0
Other Work-Related Variables		
Discretionary Job Title	[redacted]	[redacted]

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Information from Resumes		
Education	MS in Computer Science from University of [redacted] B.E. in Computer Science from [redacted]	MS in Computer Science from University of [redacted] BE in Computer Science from [redacted]
Previous Roles	[redacted]: Director of eCommerce Business Intelligence [redacted] (Acquired by Oracle in 2007) [redacted] Server Development, [redacted]: Senior Software Engineer [redacted] San Jose: Student Researcher [redacted]: Summer Intern	[redacted]: R&D Manager, Staff R&D Engineer [redacted] Corporation: Senior Software Engineer [redacted] Systems, Inc.: Senior Software Engineer [redacted], Inc.: Member of Technical Staff [redacted]. (Acquired by [redacted] Graphics): Software Engineer
Requisition Information		
IREC Job Posting Description	As a Vice President of the software engineering division, you will apply your extensive knowledge of software architecture to manage software development tasks associated with developing, debugging or designing software applications, operating systems and databases according to current and future design specifications. Build enhancements within an existing software architecture and envision improvements to the architecture. Assists in the creation of division strategy and consults with senior management in providing direction to ensure growth and financial success. Ensures a consistent approach of organizational policies and procedures. Demonstrated leadership and people management skills. Strong communication skills, analytical skills, thorough understanding of product development.[30]	As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. Define specifications for significant new projects and specify, design and develop software according to those specifications. You will perform professional software development tasks associated with the developing, designing and debugging of software applications or operating systems. Provide leadership and expertise in the development of new products/services/processes, frequently operating at the leading edge of technology. Recommends and justifies major changes to existing products/services/processes.[31]

[30] iRec Vacancy IRC1342444 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).
[31] iRec Vacancy IRC1407549 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

Dr. Madden does not examine the underlying variability in her regression model pay outcomes, and thus does not demonstrate whether protected employees share potentially common pay experiences

31. Dr. Madden argues that individual-specific differences do not matter, and that the only relevant analysis is the comparison of compensation differences across demographic groups.[32] Dr. Madden's sole focus on average group differences means she has not or cannot determine whether there is a common pattern of adverse outcomes at Oracle by race or gender. The existence of an average difference does not on its own establish that the average difference is generated by many common or shared experiences. As I wrote in my previous report,[33] the problem associated with running a regression model on a widely varying employee population is that when a model mixes apples and oranges into one pooled analysis, and estimates only the average impact of each variable (as regression models by design do), that average can mask considerable underlying variability. Again, "average" does not necessarily mean "common," if the underlying individual-level data being averaged is highly variable. The differences among employees created by their diverse attributes and a spectrum of types of work can be addressed through more refined groupings or pay factors, which in turn provide more reliable measurements of pay outcomes and differences. But Dr. Madden's analyses do not incorporate the needed refinements.

Dr. Madden's reasons for excluding Oracle variables in her pay analysis amount to assumptions and misplaced analogies to clinical trial procedures

32. As noted above, Dr. Madden discusses in her report her unwillingness to consider additional detail regarding Oracle jobs and work areas in her statistical analyses, but the explanations she provides do not hold up. On page 46 of her report, Dr. Madden writes:

[32] Madden July 2019 report, pp. 6-7
[33] Saad July 2019 report, paragraph 21.

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> "I study the compensation practices at Oracle in order to determine whether an employee's gender or race affect (sic) the outcomes. Therefore it is *only* necessary that the analyses compare similarly situated *groups* of employees by gender and race. Any characteristics that affect individual employee compensation levels but are possessed by (sic) equivalent proportions, or at equal levels, by both genders and races do not matter in the analysis of whether gender or race affects compensation [emphasis in original]."[34]

33. In other words, according to Dr. Madden, since her goal is to focus only on the average group difference in pay at Oracle between, say, men and women[35], she does not need to worry about variables that are omitted from the regression model that would serve to better explain Oracle pay for *both* men and women, but do not differ *between* men and women. The idea is that if the distribution of some work related attribute is the same for both men and women, inserting it in a regression model will not change the value of the measured effect of being female on pay; it will only serve to improve the overall explanation of pay. In the most extreme version of this circumstance, if it were the case in an analysis of gender pay differences that *every* pay related attribute were distributed identically across male and female employees, there would be no difference in an analysis that controlled for *all* of these attributes and one that did *not* control for *any* of these attributes. Therefore, under such a scenario, comparing the simple average pay for women to the simple average pay for men would be sufficient to determine the extent of the pay difference between the two groups.

34. The problem is, of course, that Dr. Madden does not test her premise; she simply *assumes* that it holds. She further assumes that if any work-related characteristics are *not* distributed identically among men and women in the group of employees being studied, that Oracle's discrimination somehow made this so. Thus Dr. Madden's analysis is based on a set of untested

[34] Madden July 2019 report, page 46.
[35] The same explanation would follow for studies designed to assess differences between employees of different races.

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assumptions that drive the type of conclusion she reaches in this case. Dr. Madden's own narrative on page 46 makes this point plain:

> "***In the absence of evidence*** to the contrary, *I* ***assume*** [emphasis added] that employees are equivalently qualified by race and gender. No presumption that one group's "unmeasured" qualifications, or jobs, are on average "inferior" to those of another group should be made, when the groups have, on average, equivalent measured qualifications. I assume that employees of the same age, time at Oracle, educational level and work area do not systematically differ by race or gender in their [other] qualifications. Therefore, to quantify racial or gender disparities in compensation, it is only necessary that we control for *systematic* differences by race of gender that remain after we have controlled for all other differences [i.e., age education and years at Oracle] that exist by group."[36]

35. Dr. Madden's "measured" qualifications are, as noted above, just age, educational level, and time since hire at Oracle. Thus, according to Dr. Madden, if these measured variables are the same across protected groups, then Dr. Madden assumes that all other, unmeasured characteristics do not differ either. But this is merely an assumption; it is not a scientifically derived outcome. In the first sentence of the above passage, Dr. Madden states her position: she assumes without any basis that there are no differences between men and women at Oracle in their unmeasured (by her) work-related attributes. She claims this assumption is "without evidence to the contrary," but of course Dr. Madden has no evidence to *support* the crucial assumption here. It is an empirical matter, not a matter of assumption, as to whether groups of Oracle employees who work in the three job functions at Oracle's headquarters differ in their work- related attributes or not.[37]

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[36] Madden July 2019 report, page 46

[37] Dr. Madden takes it a step further in her characterization of these differences. She goes on to characterize these differences, if they exist, as implying one group is "inferior" to the other. Yet there is no need for such a word to be used or for such a connection to be drawn. All that is required is that there are differences. For example, Dr. Madden measures education level and uses it as a variable in her analyses. Dr. Madden does not suggest that one group has "inferior" education to the other – just that education might differ between the groups being studied and

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36. Dr. Madden goes on to state that regression analysis is not designed to predict individual employee pay, which she appears to use as another basis for ignoring characteristics that differentiate employees and may impact pay. She states:

> "This [regression focused on group differences] is fundamentally different from an analysis of individual outcomes or differences. If we want to determine what any individual should be paid, we must control for every characteristic by which any individual differs from others. An analysis of differences in group outcomes requires that we control for the characteristics by which the groups as a whole differ, but not those by which all individuals differ."[38]

Dr. Madden's claim that there is no need to incorporate "every characteristic" in a pay analysis is very misleading. Econometricians recognize that in analyses involving many employees measured at repeated intervals over time (*i.e.*, annually), there could be idiosyncratic factors associated with each employee – for example, some employees may work harder, some less hard. However, Dr. Madden seems to be stretching this concept beyond these types of individual employee differences. She appears to argue that it is not important to capture all of the *systematic* or group-related influences on pay – *i.e.*, all of the variables that do, in a given group of people, vary among subsets of that group. As noted in my July 2019 Report in paragraphs 76 to 77, one should take into account all material factors that impact pay, because one cannot know *a priori* if these factors are correlated to protected characteristics. One cannot simply assume away one or more factors thought to influence pay. Here, that is what Dr. Madden has done. For example, by assuming that Oracle is biased in its assignment of jobs, Dr. Madden both ignores the facts to the contrary *and* fails to account for a material factor impacting pay. The effect can be seen by comparing columns in her Table 1(a). Dr. Madden inserts variables for "job descriptor" in column 6. Inserting this variable has a substantial impact on the measured

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that may relate to pay differences at Oracle, such that any such differences should be taken into account when assessing whether there are gender- or race-based differences in pay.

[38] Madden July 2019 report, p. 46.

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difference between male and female pay. Dr. Madden interprets this reduction in the measured gap between male and female pay as a measure of Oracle's biased job assignment decisions. As I have noted above and also described in paragraphs 150 to156 of my initial report, women are hired for their initial jobs in an unbiased manner relative to what they apply for, and Dr. Madden's own promotion analyses demonstrate no systematic bias in promotions. In my previous report in paragraphs 112 to 119, I demonstrated that there are in fact a number of factors like organization and patent activity that relate to pay generally and are correlated with gender among this employee population, such that when properly accounted for the statistical results change dramatically.

37. Another way to state this is that I have focused in my previous report on the wide variations in the relationship of actual to regression predicted pay not to point out that there are idiosyncratic employee-level factors that were omitted from the OFCCP's SAC models, but instead to point out that these variations are caused by the omission of *group*-related *systematic* factors that pertain to the employees being studied differently than to other subsets of employees. This is a critical distinction that cannot be overstated: Dr. Madden claims that any variation in employee outcomes that are associated with applying her model – i.e., any demonstration that her model doesn't accurately predict pay for large numbers of the employees in her pay model – is irrelevant, because her model focuses on differences between groups, not individuals. But it is the failure to include the appropriate *group*-associated variables in the regression that produces the enormous variances in predicted outcomes, *not* the omission of the idiosyncratic factors. Take, for example, Dr. Madden's omission of standard job title in column 5 of her tables. Putting aside the issue of "taint" (which Dr. Madden would automatically ascribe to such a variable), omitting standard job title when two employees share the same race, age, education

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level, and time since hire at Oracle will produce enormous unexplained differences between actual and predicted pay where – as here – individuals in the population vary widely in the type and level of jobs they hold. Recall the comparison between the employees I discussed earlier, where one earned over [redacted] as a Product Development SVP (career level M7) compared to [redacted] for the employee whose job title was Program Manager 4 (IC4 career level). By extension, any other *systematic* variables that are omitted will create the same problem: large individual variances will exist, and the measure of the group averages for male and female employees will be potentially highly biased and misleading.

38. The graph below plots Medicare wages for each employee on the vertical axis as in Dr. Madden's gender pay model and what their predicted or regression "fitted" compensation would be based on the variables other than gender she uses to generate the results in column 5 (race, age and its squared term, level of education and U.S. Oracle tenure with its associated squared term).[39] I have restricted the chart to employees whose actual pay is under [redacted] because otherwise a disproportionate share of the data points would be compressed by the scale into the lower left corner of the chart area.[40] Each dot in the graph indicates a person-year in the data. The dashed line indicates where actual pay equals predicted pay – i.e., the line where the regression variables serve to explain the actual pay an employee received. Dots above the dashed line indicate employees who are paid more than Dr. Madden's model predicts; dots below the line indicate employees who are paid less than her model predicts. By design, because regression models estimate the average effect, roughly half of all the points should be scattered randomly above the line and half below.

[39] Gender is excluded so that pay is not predicted taking gender into account.
[40] In the unrestricted data, the range of regression-predicted pay ranges from [redacted] but actual pay ranges from [redacted] hereby compressing the chart visually.

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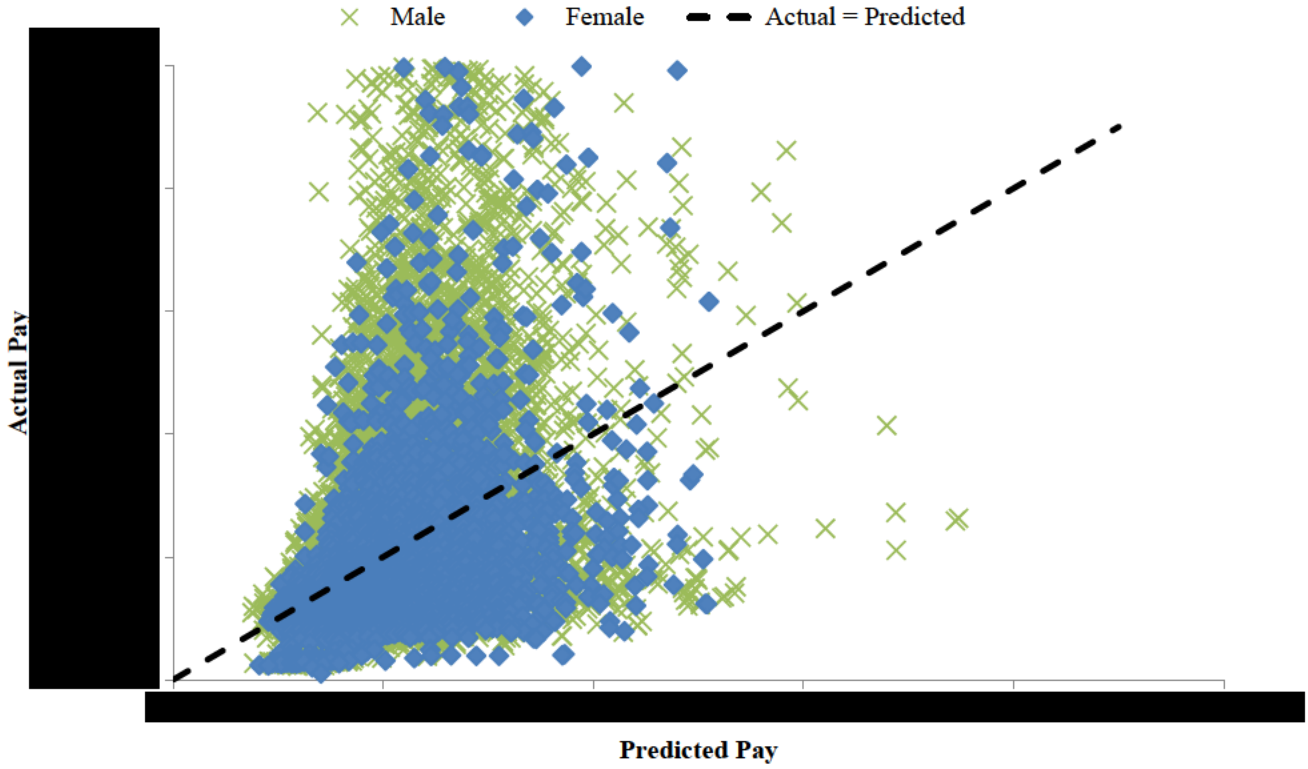
Dr. Madden's Regression Model Cannot Explain Wide Pay Differences in Employees it Considers Similar: Actual vs. Predicted Total Compensation (Medicare Wages)

- Prediction Based on Dr. Madden's Model, Column 5, Without a Gender Control -

- 2013- 2018, INFTECH, PRODEV, and SUPP Job Functions -



Not shown: 328 observations whose actual pay exceeded [redacted]. Model controls for race, age, education, and time at Oracle.

39. As in similar charts I included in my initial report which were based on application of the OFCCP's regression models from the SAC, Dr. Madden's regression model cannot explain wide pay differences in employees it considers similar. For example, take the point along the horizontal axis at [redacted], which is where predicted pay equals [redacted]. If one were to draw a straight line vertically from that point upwards, it would intersect with a dot for an employee below the dashed line indicating someone whose actual pay was below the predicted amount of [redacted]. If one were to continue that same line up from $[redacted] and intersect it with an employee dot above the dashed line, that is someone whose actual pay was higher than the predicted [redacted]. Both of those dots represent employees who based on their observable

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characteristics, were predicted by the OFCCP model to be paid [redacted] but one is paid more than the expected [redacted] and the other employee is paid less. Indeed, the range is wider than is depicted in this chart, which is restricted to employees with actual earnings under [redacted] The actual maximum pay for those predicted by Dr. Madden's model to earn [redacted] is far above [redacted]

40. This wide variation in actual pay between employees that the model considers roughly similar is unexplained by the regression model; the model generates the same average prediction for all of them because they share the same values for age, educational level and Oracle tenure. There are several explanations for why the model is that far off explaining pay at Oracle. First, Dr. Madden mis-measured total compensation by including portions earned by exercising stock options from previous years. Second, the control variables used in the model do not similarly situate employees and hence do a poor job at explaining pay generally. Third, the single regression model is applied to an employee population that is far too diverse.

41. The scatterplot above was derived using the model behind column 5 of Dr. Madden's results in her Table 1. Below, I repeat the exercise, except I use the model behind Dr. Madden's column 8, which in effect controls for standard job title by adding job "descriptor," exempt status, IC or M career path and global career level. This model is similar to the one the OFCCP relies on in the SAC and it shares those flaws in that employees are not necessarily doing the same work even if they share a job title and career level. The scatterplot (again plotting only employees earning under [redacted]) below also reveals a great deal of variation in outcomes among employees Dr. Madden's column 8 regression model considers similar. For example, there are women who are paid well above what the model predicts and women who are paid less than what the model predicts. Person ID 97256, a female employee, had actual earnings of

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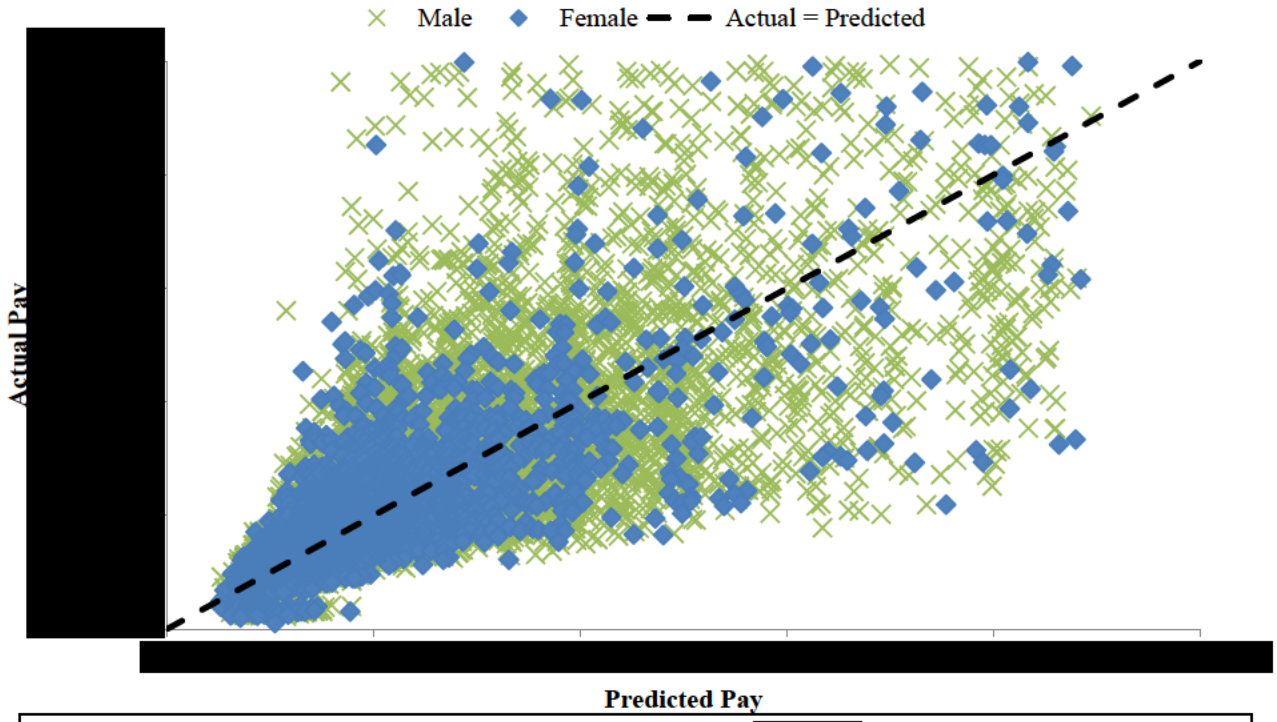
[redacted] in 2018 according to the data but her predicted earnings for that year were [redacted] based on the model. The same model predicts similar earnings for the female employee with the Person ID 221817 [redacted] but her actual earnings were [redacted] in 2017. Overall, the regression-predicted pay in this model ranges from [redacted], when actual pay ranges from just over [redacted].

Dr. Madden's Regression Model Cannot Explain Wide Pay Differences in Employees it Considers Similar: Actual vs. Predicted Total Compensation (Medicare Wages)

- Prediction Based on Dr. Madden's Model, Column 8, Without a Gender Control -

- 2013- 2018, INFTECH, PRODEV, and SUPP Job Functions -



Not shown: 345 observations whose actual pay or predicted pay exceeded [redacted]. Model controls for race, age, education, time at Oracle, exempt/non-exempt, job descriptor, management control, and global career level.

42. Dr. Madden argues that all that matters is what happens on average, and that on average women are paid less than similarly skilled men.[41] My point in looking at the scatterplots is that

[41] A regression coefficient is an *average* effect, a single number that summarizes the average relationship between two variables (such as compensation and gender) holding other factors constant (such as tenure).

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the average alone is insufficient for understanding the pay of protected groups. How well that average summarizes the many data points being averaged is equally important. As a labor economist, I question whether a regression model that under-predicts pay by *millions* of dollars is a reliable basis upon which to draw conclusions about the relationship between protected status and pay.

Dr. Madden's claim that her analysis is akin to a clinical trial is completely wrong

43. Dr. Madden claims on pages 47 and 48 of her report that the statistical analysis of employment discrimination is akin to the analysis of data on treatment results in a clinical trial setting. This is incorrect. Her notion that any differences in compensation attributed to variables outside of her regression model should "wash out" is based on a fundamental misstatement of basic principles of clinical research design.

44. Clinical trial-based statistical research is formally speaking a scientific experiment, meaning it requires a *randomized assignment* of individuals to either a control group or a treatment group.[42] It is this randomization process that ensures the effect of unobserved or unmeasured characteristics between the control and treatment groups will be expected to, and thus can be assumed to, average out. In other words, if I take a large enough population and randomly separate it into two subsets, none of the characteristics of the two subsets will be expected to differ except by random statistical fluctuation; the average height will be the same, the average weight will be the same, the average education will be the same, and the distribution of occupations will be the same. In such a context, there would be no concern about omitted variables in a statistical analysis designed to compare outcomes when you administer a medication or some other "treatment" to one group and not the other; nothing else can have

[42] Cameron, A. Colin, and Pravin K. Trivedi. *Microeconometrics: Methods and Applications*. Cambridge University Press, 2005. Pp. 48-52.

caused whatever impact the medication has, since nothing else differs between the two groups. By intentional experimental study design, the omitted variables are irrelevant since their averaged effects are identical for *both* the treatment and the control groups because one constructs any such study with this in mind. Thus because of the neutralizing of the effects of unobservable/unmeasured factors through randomization, the effect of the treatment that is the focus of the experiment can be estimated reliably because no other intervening variable is *able* to create a difference between the treatment and control groups.[43] One will often as a consequence see that the statistical research is limited to very simple two variable models: the dependent variable and the single explanatory variable that is the focus of research. Such an approach is simply not possible when using real-world employment data at a particular company; such data is not generated by random assignment of employees into buckets but are instead *observed* data given *as is* to the researcher. These issues are the subject of a large literature on research design inside and outside of economics.[44] If unobserved differences between non-randomly determined groups of study subjects are unaccounted for in the statistical analysis, the estimated "discrimination effect" from a variable in the analysis for gender or race will be unreliable due to omitted variable bias.[45]

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[43] See for example, Hicks, Charles. (1982) Fundamental Concepts in the Design of Experiments, p. 5.

[44] Imbens, Guido W., and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." *Journal of Economic Literature*, 47 (1): 5-86. Heckman, James J., Robert J. LaLonde, and Jeffrey A. Smith. "The economics and econometrics of active labor market programs." In *Handbook of Labor Economics*, vol. 3, pp. 1865-2097. Elsevier, 1999. In 2000, Dr. James Heckman won the Nobel Prize in Economic Science because of his work on the econometrics of analyzing non-random data. Angrist, Joshua D., and Jörn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con Out of Econometrics." *Journal of Economic Perspectives*, 24 (2): 3-30.

[45] Saad July 2019 report, paragraph 77.

45. By interpreting the results in her column 5 as evidence of discrimination, Dr. Madden is at odds with what she has said on the issue of omitted variables in research she has published outside of the litigation context:

> "While the economic implications of these two explanations of the sex-age differential [human capital theory and discrimination] are enormously different, both explanations are consistent with empirical studies simply because both resort to "nonmeasureables" to explain the sex-wage differential: ***empirical studies cannot measure directly either discrimination or job-specific human capital. Therefore, the problem with these two competing explanations of the sex-wage differential is that neither has been empirically sorted from the other***. Both explanations are consistent with data which show a wage differential by sex after controlling for education, work experience, and job tenure. [emphasis added]"[46]

46. Dr. Madden ignores the most basic principle of empirical research by *assuming* that certain variables – namely, anything and everything that is omitted from her analysis – are distributed identically across demographic groups, or even more extreme, that if these variables do differ by group, they only do so because of the discriminatory behavior of an employer. Taken to its logical extension, this view implies that every employer should look like every other employer, and the distribution of workers by demographic characteristic can never be anything but random unless there is employer discrimination. Hence a pay regression applied to a fast food franchise, or any other workplace, can and should be the same as one applied to Oracle's headquarters and the employees working there in PRODEV, INFTECH, and SUPPORT.

Dr. Madden's regression models have very low explanatory power, which is an indication that the variables that are left out of her analysis are responsible for most of the variation in pay and their omission cause biases in pay differences by gender and race

47. The fact that Dr. Madden's regression models do such a poor job at explaining individual -level pay is not (as she claims) because regressions are not designed to predict or "set"

[46] Madden, Janice Fanning. "Gender differences in the cost of displacement: An empirical test of discrimination in the labor market." *The American Economic Review* 77, no. 2 (1987): 246-251, p. 246.

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individual pay[47]; it is because Dr. Madden has left out so many factors that would enable the regression to do a better job at capturing what matters for pay at Oracle, for these specific employees in this specific workforce. R-squared is the test statistic used in regression analysis to measure the proportion (or percentage) of variation in the variable being studied (pay), explained by the factors included in the model. R-squared ranges from zero to one, or 0% to 100%. Typically in pay regressions conducted on census data, which has none of the detail that company data contains, R-squared will range up to 50%. In company data R-squared can range upwards of 90%.[48] For the first five columns of Dr. Madden's Table 1(a), R-squared ranges from 2.9% (average across the years in her analysis when only gender is in the model) , to 20.6% for column 5, which has gender, race, age, education level, and time since hire at Oracle as variables. These are very low R-squared figures for an analysis examining company-level data. In other words, the final model Dr. Madden endorses to test for pay biases – column 5 – leaves nearly 80% of the variance in pay among employees unexplained. Even the model underlying column 8 only has an adjusted R-squared of about 69% on average. With so much of the explanation of pay left out of the model, one should be concerned that what is omitted would greatly impact the gender coefficients that Dr. Madden relies upon, because some of these omitted variables could be correlated to gender or race.

[47] Madden July 2019 report, p. 6

[48] R-squared is a quantitative measure of how well the regression model fits the data. A model that explains none of the variation in the dependent variable has an R-squared of 0; a model which perfectly predicts the variation in the dependent variable has an R-squared of 1 (Gujarati (1988), p. 67). Whether a particular R-squared is high or low depends on the data being analyzed. In time series data, R-squared tends to be quite high. An R-squared of 0.9 in a time series might be considered low. In Census data or in other one-time cross-section surveys collected across a broad swath of the population, an R-squared of 0.3 might be considered reasonably high. Data collected in a single company provides a great deal of detail about employees, unlike widely accessible databases like the Census which collects data on non-workers, pilots, teachers, janitors and entertainers, among others. One therefore expects much higher R-squared results in single company data.

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Dr. Madden's education variable focuses only on degree earned, not on major, and is missing for most incumbents

48. Dr. Madden's "human capital" model does not adequately control for even the limited "human capital" measures she tries to include. Note my earlier point that if Dr. Madden thought that all Oracle variables should be excluded, then she had an extra burden to take great care in constructing the variables that were supposed to measure human capital prior to Oracle employment. She took virtually no care with this process. With respect to education, Dr. Madden assumes that all details left out of her model – type of major, where the school degree was earned from, whether a master's degree was an M.S., an M.B.A., or an M.P.H. – would wash out, in the sense that they would not differ by gender or race. But there are substantive differences in the kinds of educational skills (part of that "human capital") obtained by employees that are key to explaining their pay regardless of race or gender. Consider the two employees having Person IDs 891719539 and 892277125. Both are white women with bachelor's degrees, 51-53 years old, and have about two years of experience at Oracle when measured in 2014. But employee 891719539 was a [redacted] with a salary of [redacted]; and the other was a [redacted] earning [redacted]: [redacted]. According to Dr. Madden's model, they should be paid the same. But the former has a B.S. in Computer Engineering and work experience that includes IBM and Sun Microsystems, according to her resume that was produced during discovery.[49] The latter has a B.S. in Economics and Financial Analysis, and her previous experience was at Keynote Systems and at Wal-Mart.[50] Consider Person ID 203526 as well. Her degree is DVM (Doctor of Veterinary Medicine) and her experience includes just over 2 years working as a vet and more than 5

[49] ORACLE_HQCA_0000085524
[50] ORACLE_HQCA_0000086748

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months as a researcher at Stanford's Medical School.[51] Person ID 891093873 holds B.S. in Psychology and worked for about 4 years in neuropsychology research and as a sleep study technologist. [52]

49. College major and field of study are unquestionably omitted variables relevant to Dr. Madden's analysis, and there is no reason to simply assume that they are distributed identically across the demographic groups. In fact, these characteristics may not be identically distributed – either at Oracle or in the population at large. According to the National Center for Education Statistics, in 2014-15, 17.1% of college degrees earned by white men were in computer and information science, engineering and engineering technologies and engineering-related fields.[53] The corresponding percentage for Asian men was 24.3%, for African-American men 12.7%, for white women 2.7%, for Asian women 6.1%, and for African-American women 2.3%. There is no evidence that everything left out of Dr. Madden's model is demographically neutral and can safely be ignored. The logic of including education level in her model but not specialization seems to be that there are important differences between genders and race with respect to educational level but not educational specialization.

50. The available data from Taleo, iRec and other sources Dr. Madden used to gather information on degree earned also lists college majors for Oracle employees, and though she included them in her dataset, she did not utilize the information.[54] Her dataset shows that women were less likely to major in computer science and engineering than were men among the

[51] ORACLE_HQCA_0000301172
[52] ORACLE_HQCA_0000083767
[53] See National Center for Education Statistics Table 322.40. Bachelor's degrees conferred to males by postsecondary institutions, by race/ethnicity and field of study: 2014-15 and 2015-16 and Table 322.50. Bachelor's degrees conferred to females by postsecondary institutions, by race/ethnicity and field of study: 2014-15 and 2015-16 in Attachment C to this report.
[54] Dr. Madden searched Taleo, iRecruitment, and miscellaneous tables from the GSI system for educational level and major (though she does not use the major data). If education was missing from all these sources, Dr. Madden looked at resumes where available.

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population being studied (73% versus 79%), and more likely to major in business (15% versus 12%).[55] These differences are statistically significant.

Male Versus Female Areas of Study in Dr. Madden's Data				
Area of Study	**Male**		**Female**	
	N	**%**	**N**	**%**
COMPUTER SCIENCE & ENGINEERING	1,741	79.1%	527	73.2%
BUSINESS/MBA	260	11.8%	107	14.9%
STEM NON ENGINEERING	128	5.8%	32	4.4%
OTHER NON-SCIENCE	72	3.3%	54	7.5%
UNKNOWN	1	0.0%	0	0.0%
Total	**2,202**	**100.0%**	**720**	**100.0%**
Note: Unknown category contains majors with in indiscernible characters or abbreviations.				

51. Similarly, Asians were more likely to have majored in computer science and engineering than whites (84% versus 60%), and less likely to major in business (10% versus 18%). These differences are also statistically significant. Yet Dr. Madden did not incorporate any of this information alongside education in her model, thereby attributing any pay differences between women and men, or Asians and whites that were actually generated by differences in their educational specialties to hypothesized discrimination by Oracle.

[55] I grouped the various detailed majors in the data into the categories for easier viewing.

Asian Versus White Areas of Study in Dr. Madden's Data				
Area of Study	**Asian**		**White**	
	N	**%**	**N**	**%**
COMPUTER SCIENCE & ENGINEERING	2,176	83.6%	293	59.9%
BUSINESS/MBA	264	10.1%	88	18.0%
STEM NON ENGINEERING	119	4.6%	56	11.5%
OTHER NON-SCIENCE	42	1.6%	52	10.6%
UNKNOWN	2	0.1%	0	0.0%
Total	**2,603**	**100.0%**	**489**	**100.0%**
Note: Unknown category contains majors with in indiscernible characters or abbreviations.				

52. African-Americans were less likely to major in computer science and engineering than whites (54% versus 60%) but the difference is not statistically significant.

African-American Versus White Areas of Study in Dr. Madden's Data				
Area of Study	**African-American**		**White**	
	N	**%**	**N**	**%**
COMPUTER SCIENCE & ENGINEERING	14	53.8%	293	59.9%
BUSINESS/MBA	6	23.1%	88	18.0%
OTHER NON-SCIENCE	6	23.1%	52	10.6%
STEM NON ENGINEERING	0	0.0%	56	11.5%
Total	**26**	**100.0%**	**489**	**100.0%**

53. Both national data on computer science and engineering degrees and Oracle data on college majors indicate that employees of different genders and races tend to have different educational specialties. These types of details speak directly to “group differences” in key

variables that Dr. Madden argues must be accounted for and yet her model does not account for them. Indeed, as published work in labor economics makes clear, a "fundamental problem" that impacts simplistic wage regressions "is that the control variables that are included [ ] may not fully capture marginal productivity differences. In particular, when there are unmeasured productivity differences that are systematically different across groups (e.g., race or sex), spurious evidence of discrimination can result."[56] These problems have led many economists to suggest that "we should look to other methods" to more reliably study pay discrimination.[57] There is no sense in which group is "inferior" to the other, to use Dr. Madden's term – just that they are different. In some companies women may possess educational credentials that earn them more than men; in other companies, it could be the opposite. Dr. Madden included this information in her dataset but then did not use it.

54. Remarkably, of the three "human capital" variables in Dr. Madden's pay models (age, education level, and time since hire at Oracle), one – education level – is missing for more than half the incumbents in the data that Dr. Madden used. In Dr. Madden's data, 53.5% to 66.5% of incumbents are missing education, depending on the year. Her model generates statistically significant coefficients on having attained a Ph.D., which is easy enough to understand, but also for those for whom education information is coded as "missing"; there is no readily apparent reason why having missing education information in Dr. Madden's dataset should correlate at all (much less to a statistically significant degree) with pay, which underscores that this variable is available in a non-random way. Thus, although Dr. Madden relies on just three variables in her "human capital" model, one of them is functionally useless in accurately distinguishing among

[56] Hellerstein, Judith K., and David Neumark, 2006. "Using matched employer-employee data to study labor market discrimination." In Handbook on the Economics of Discrimination, ed. William Rodgers, 29–60, page 5. Cheltenham, UK: Edgar Elgar.
[57] Hellerstein and Neumark (2006), page 6.

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employees and to the extent the information is available, it is only for a non-random subset of the population.

55. Women are statistically significantly more likely to have missing degree earned information than men, and Asian employees are statistically significantly less likely than white employees to be missing degree data. The differences between white and African-American employees are not statistically significantly different. One of the few "human capital" variables Dr. Madden relies on is also missing non-randomly for the groups whose pay is being compared. In other words, the gender and race coefficients are picking up some of the impact of missing education rather than supposedly measuring Dr. Madden's hypothesized discrimination.

56. The amount of missing information is also higher than it should be because of an error in Dr. Madden's computer program that codes 79 incumbents as having missing education when their information is actually available.[58] For example, Person ID 892355381 is marked as having unknown education level in Dr. Madden's dataset. However, her resume shows that she has a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology.[59] According to the Madden dataset, Person ID 891327204 is also missing education information. His resume shows he completed a Bachelor of Engineering (B.E.) in Information Science and Engineering from B.M.S. College of Engineering, Bangalore (Bangalore University), India. He also has a Diploma in Financial Services/ Planning from

[58] The problems that created this error in Dr. Madden's data are, first, a data merge that relied on the incomplete variable gsipartyid rather than person_ID: 57 incumbents are missing values for gsipartyid and so her program does not merge on their available education information. An additional 22 incumbents had degree information manually coded in a file called "posthandediting.xlsx," but the computer program "AssemblePeople.do" never retrieves that Excel file to merge on the education data. In all, 79 incumbents for whom education data was in fact available were coded as missing education information.

[59] ORACLE_HQCA_0000304749

Securities Institute Academy, Sydney.[60] Person ID 893502891's resume lists a Master of Science in Engineering in Computer Science from University Sapienza of Rome but is missing education information in Dr. Madden's dataset.[61] Similarly, Person ID 893950895 has a Bachelor of Arts in Philosophy from California State University, Chico but has been flagged as missing education in the Madden data.[62]

57. Dr. Madden's pay models do not control adequately for degree earned, in that the data are missing for over half the incumbents in the data sources she used, and she does not use any of the available information on educational specialization or institution granting the degree. These issues render her "education" control inadequate. As I discuss below, the measures she relies on for experience and tenure are similarly problematic.[63]

Dr. Madden's experience and tenure variables are inadequate

58. In an attempt to control for "experience," Dr. Madden controlled for age, age squared, tenure at Oracle America, Inc., and tenure squared.[64] But these controls are inadequate. It is untenable from a labor economics perspective to think that after holding educational degree constant, age is all it takes to similarly situate employees with respect to skills, experience, and abilities prior to their arrival at Oracle, at which point they will work in jobs that are highly complex and tremendously varied in work content. Dr. Madden does nothing to take into account differences in the nature of prior experience. She simply assumes that whatever differences there are between employees has no correlation to gender or race. However, at the

[60] ORACLE_HQCA_0000084485
[61] ORACLE_HQCA_0000300345
[62] ORACLE_HQCA_0000302615
[63] I remind the reader that in my pay analysis, the omission of education is not an issue since I have utilized a number of variables from Oracle that correlate with education and skills that employees had at hire.
[64] She does adjust tenure to subtract off leaves of absence at Oracle America Inc. by only counting time an employee's status is "Active."

risk of being repetitious, this is only an assumption on her part, because she does not address the questions empirically.

59. Dr. Madden's experience variable ignores important components of relevant prior experience that are included in the data. Dr. Madden treats time worked at Oracle India or any other international Oracle affiliate like work in the general labor market rather than direct experience with Oracle products or services. For example, Person ID 894183158 has over 16 years of Oracle India experience and almost one and a half years at Tata Consulting Services, as indicated by his continuous service hire date and resume used for his hire application.[65] Surely previous work at Oracle is more relevant to pay than non-Oracle work. Similarly, time worked at non-tech companies is lumped together with time worked at tech companies, which results in inaccurate estimates of truly relevant experience. Person ID 891648358 worked for 5 years as a substitute teacher in Spokane Public schools (as well as several other public school teaching positions) while working as an "on call" IT consultant.[66] Person ID 891120048 worked as a "Sequencing Associate" for three years at beginning of her career in lab tech roles.[67] In contrast, other experience is highly relevant. Person ID 892093428 was the Director of Azure Platform Quality Assurance at Microsoft (Azure is Microsoft's cloud platform which competes directly with Oracle's offerings).[68] Person ID 890828962 worked at Google as a Senior Software Engineer.[69] Person ID 7933 was a Senior Director at Ebay and a Senior Architectural Engineer at Microsoft.[70] Person ID 124243 worked as Global Head of Data Architecture & Infrastructure

[65] ORACLE_HQCA_0000304127
[66] ORACLE_HQCA_0000085283
[67] ORACLE_HQCA_0000087999
[68] ORACLE_HQCA_0000086216
[69] ORACLE_HQCA_0000083187
[70] ORACLE_HQCA_0000301320

at Paypal.[71] All of this experience is included in Dr. Madden's pay model as equivalent "years of experience" measured using age.[72]

60. Moreover, simply controlling for age ignores the well-documented fact[73] that women are more likely to have spent time out of the workforce than are men of comparable age. As I demonstrated in my initial report in paragraph 112, this is true at Oracle as well. Dr. Madden's model accounts for leaves of absence at Oracle but does not account for this difference in non-work time prior to Oracle. Her model forces the effect of that difference through the gender coefficient in her model – that is, it inappropriately attributes unmeasured differences in work experience to gender discrimination. As she notes, the problematic exclusions from her model are the ones that are correlated with gender or race, because omitted variable bias makes the gender and race coefficients unreliable measures.

61. Because Dr. Madden aggregates her model across job functions and organizations, the effect of company tenure – i.e., the impact of an additional year at Oracle on pay for a given

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[71] ORACLE_HQCA_0000302319

[72] These differences are also not accounted for in her starting pay model. Dr. Madden even notes that this information is important for accurately modeling starting pay: "If the effect of differences in starting jobs were due entirely to gender differences in ***educational and experience specialization areas*** prior to hire by Oracle, then this is an appropriate modification of the gender differentials in compensation." Madden July report, p. 19; emphasis added.

[73] Hellerstein, Judith K. and David Neumark, (2006) "Using matched employer-employee data to study labor market discrimination," *Handbook on the Economics of Discrimination*, edited by William M. Rogers III, Edward Elgar, pp. 34. Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz (2010). "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors." *American Economic Journal: Applied Economics*, 2(3): 228-55. Goldin, Claudia. (2014) "A grand gender convergence: Its last chapter." *The American Economic Review* 104, no. 4: 1091-1119. Blau, Francine D., and Lawrence M. Kahn. (2017) "The gender wage gap: Extent, trends, and explanations." *Journal of Economic Literature* 55, no. 3: 789-865. Spivey, Christy (2005). "Time off at what price? The effects of career interruptions on earnings" *ILR Review*, *59*(1): 119-140. Waldfogel, Jane (1998). "Understanding the "family gap" in pay for women with children." *Journal of Economic Perspectives*, 12(1): 137-156. Angrist, Joshua D., Stacey H. Chen, and Jae Song. (2011) "Long-Term Consequences of Vietnam-Era Conscription: New Estimates Using Social Security Data." *American Economic Review*, 101 (3): 334-38.

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employee – is averaged across everyone. The results she generates are unexpected and counter to the economic assumptions on which she relied. In the simple human capital model that Dr. Madden claims to be estimating, company tenure is typically posited to be positively *and strongly* related to pay as employees gain on-the-job skills and experiences, and the squared term is typically posited to be negative because the incremental effects of tenure grow progressively smaller with greater tenure, a pattern implied by the human capital theoretical models. However, Dr. Madden's results show that holding age constant, longer company tenure is statistically significantly *negatively* related to pay in some of her gender and race analyses and squared company tenure is statistically significantly *positively* related to pay. The fact that in the case of Oracle we do not see the "textbook" version of the relationship between tenure and pay (*i.e.*, a positive relationship that flattens over time) suggests that her use of this simple approach with company tenure is not appropriate. For example, Dr. Madden could have used time in job to more accurately model the relationship of tenure and pay, and properly accounted for time worked at Oracle affiliates and acquisitions.[74]

62. I discuss next the statistical evidence I have found that contradicts Dr. Madden's assumption that all variables related to work at Oracle are "tainted" and should be omitted from analysis of pay.

Dr. Madden includes but then discounts a handful of variables related to work performed at Oracle, but these measures are inadequate to group together employees whose skills, duties, and responsibilities are in fact similar

63. In her tables summarizing the results of her pay analyses that sequentially add the "human capital" variables to a variable for gender or race (columns 1-5), Dr. Madden further present several additional columns where she introduces what she calls "endogenous" or

[74] Dr. Madden does use time in grade to analyze promotions in her Appendix B models. It is not clear why she excluded this from her pay models.

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"Oracle" variables (columns 6-8). As I discussed above, she is not doing this to further narrow employee comparisons to those employees performing similar work from a labor economics perspective. Instead she does this to illustrate what she claims are the reasons for the adverse outcomes in pay seen when only pre-Oracle "human capital" factors are taken into account.[75] Thus, adding variables for "job descriptor" demonstrates to her Oracle's discriminatory "placement" of employees into different "job descriptors," adding exempt status represents Oracle's discriminatory "assignment" of employees to jobs carrying exempt status, adding a flag for whether an employee is a manager or not indicates Oracle's disparate "assignment" of employees to managerial roles, and adding career level demonstrates according to Dr. Madden the impact of Oracle's discriminatory "placement" of employees into career levels. It is a quite remarkable position she has taken: that every bit of the differences in the distributions of jobs and levels within Oracle is *assumed to be* exclusively caused by discriminatory actions by managers throughout Oracle.

64. As noted, Dr. Madden takes this extreme view with little or no statistical evidence that these company-specific variables are "tainted." Simply adding job characteristics like career level to a pay model and observing how the race or gender coefficient changes does not constitute a *test* of whether the decisions of any Oracle manager, or all of them, are biased. Dr. Madden interprets her results as evidence of bias by Oracle; I interpret her results as an initial step toward actually comparing employees with similar skills and experiences performing similar work.[76] In fact, Dr. Madden's back-up production is more consistent with my interpretation than

[75] According to Dr. Madden, "[e]ndogenous characteristics cannot be used in any analyses of whether discrimination has occurred. Endogenous characteristics may be included in an analysis of discrimination, however, in order to assess the mechanisms by which discriminatory compensation occurs." Madden report, p. 8.

[76] This is not an endorsement of columns 6 through 8 of her results; I reserve my discussion of the inadequacy of her controls for job content for a subsequent section to focus on the point I am

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the one she advances. Her back-up shows adverse promotion outcomes for women in just two of the eight levels she studied (which I show below do not hold up under scrutiny), and one statistically significant *positive* outcome (which Dr. Madden chose not to present in her Appendix B). When I estimate her models for Asians and African-Americans (which she does not do), there are no significant adverse outcomes in promotion and the only statistically significant outcomes are *positive*.[77] Dr. Madden has provided no evidence that initial positions at hire and promotions are problematic, and thus she has no evidence that supports excluding details about the work performed by different employees from the pay models. None of Dr. Madden's analyses provide evidence of biased decision making by Oracle managers. My analysis demonstrates that Dr. Madden's assumptions that job and work detail are variables "tainted" by discrimination are unwarranted and contradicted by the available evidence.

There are gender and race differences in the levels people apply to at Oracle, and Oracle largely hires people into the level they applied for

65. In my initial report, including specifically in paragraphs 147-149, I studied the extensive information related to applications for jobs at Oracle arising from experienced, lateral applicants. I showed in that report (paragraph 149) that women tend to apply for lower IC-level jobs than men do, and that Asians also differ from whites in the levels to which they apply. I also showed in paragraphs 150 to 156 that there is no difference by gender or race in what jobs applicants were hired into relative to what they applied to, pursuant to the thousands of requisitions posted by the hundreds of organizations at Oracle over the period in question. Dr. Madden ignores the process by which job openings are posted both internally for current employees and externally to

making here, that adding these variables to her model is not in any way a test of whether Oracle managers make decisions that are biased.

[77] I used her computer program to examine this, modified to study race instead of gender.

the general public.[78] Instead she refers to Oracle "assigning" jobs and "placing" employees, and claims that any company-specific variables like job title and career level are "endogenous" and therefore tainted.

66. My earlier finding that applicants generally are hired into the jobs to which they apply is inconsistent with Dr. Madden's assertion that one should not control for factors indicating the job performed at Oracle in the various regression models. Instead, employees determine the jobs to which they apply for consideration by Oracle, and in the vast majority of cases – irrespective of race or gender – Oracle hires employees for those jobs.

67. Because these variables are "untainted" by bias, they are appropriate for pay models even under Dr. Madden's analytic approach.[79] They serve to better similarly situate hires by skill and responsibility. My initial report discussed in paragraphs 157 to 160 how there is a mix of positive and negative coefficients for race and gender, indicating that there is no pattern of adverse differences in starting pay across the job functions.[80] I also found no differences in terms of pay growth thereafter, once additional readily available additional factors are introduced (see paragraphs 161 to 163 of my initial report).

[78] See Oracle U.S. Employee Handbook, p. 45 (ORACLE_HQCA_0000000464.pdf). See also Kate Waggoner deposition, May 1, 2019, 144:6-8. Open job postings are also accessible on the public website (https://oracle.taleo.net/careersection/2/jobsearch.ftl?lang=en).

[79] Because these initial position variables (standard job title and organization) are more detailed indicators of the skill demanded and the scope of responsibilities, they obviate the need for highly detailed education and prior experience variables that Dr. Madden's starting pay and incumbent pay models require.

[80] Table 4 of Dr. Madden's report also shows that after controlling for "job descriptor" and career level, there are no differences in starting pay between whites and Asians (as well as between whites and African-Americans, which was true even without job area or career level in the model).

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Dr. Madden assumes that all Oracle actions are "tainted" by discrimination but her back up shows her own analysis uncovered no systematic promotion issues

68. As noted above, Dr. Madden has assumed that Oracle has completely and exclusively determined all of what she deems "Oracle factors" in a discriminatory manner and has not based those assignments on merit or skill. She has no solid empirical evidence this is true. For example, she presents no robust analysis of promotion at Oracle, which according to her assumption, would show statistically significant and substantial disparities in promotions across career levels for women, Asians, and African-Americans. The promotion analysis she does conduct is relegated to an appendix. However, Dr. Madden limits the results she shows in her Appendix B to those dealing with the promotion of women from IC3 and IC4 jobs.[81] Her back-up production material includes the computer program she used to generate this table, which I have used to generate the table below.[82] She does not show the full results from her backup in the text of her report.[83] She chose only to present the results for IC3 and IC4. The rest of the table shows that there are no other levels with a statistically significant adverse promotion outcome for women and one level (M5) with a statistically significant *positive* outcome for women. Dr. Madden elected not to present these other findings, which undercut any claim that career level advancement is systematically biased against women at Oracle.

[81] Dr. Madden only studied employees who worked all year. By excluding part-year workers, including those who were on a leave of absence, she excluded 5.7% (51 out of 895) of male promotions and 14.5% (51 out of 353) of female promotions in her IC3 and IC4 promotion regressions.

[82] Dr. Madden's defines promotion as year-end career level greater than the prior year-end career level. Since "M" comes after "IC" alphabetically, any movement from the IC levels to any M level is flagged as a promotion.

[83] She also does not elucidate why time in grade is relevant for promotions but not pay, where she excludes that measure of tenure.

Madden Appendix B: Regression Analysis			
Gender Differences in Probability of Moving from Global Career Levels Controlling for Race, Ethnicity, Age, Education, Time at Oracle, Time in Grade, and Year, 2013-2018			
From Career Level	**N**	**Female Coefficient**	**Standard Deviation**
IC1	113	-0.13	-0.36
IC2	1,380	0.02	0.24
IC3	3,433	-0.19	-3.08
IC4	6,823	-0.16	-2.87
IC5	4,698	-0.11	-1.16
IC6	337	--	--
M2	660	-0.09	-0.67
M3	2,261	-0.03	-0.40
M4	2,307	-0.07	-0.67
M5	1,746	0.29	2.06
M6	491	-0.28	-0.61

69. To study promotions from the IC3 and IC4 career levels in more detail, I also estimated her model by year. The next table shows that there is only a single year in one level that is statistically significantly adverse to women.[84] Based on evidence that shows that gender differences are not statistically significantly different except in one year and one level, Dr. Madden nonetheless asserts that career level should not be included in any of the pay regression models for both race and gender. This is simply unjustified from both an econometric and a labor economics perspective. In fact, Dr. Madden's results for female promotions would not lead a labor economist to conclude Oracle is discriminating at all against women in promotions; the evidence simply does not support such an inference.

[84] There are over 150 women in most years in IC3 and over 300 in every year in IC4, which are certainly large enough groups to analyze with precision. Even setting aside the issue of precision, however, the coefficients themselves are small.

Madden Appendix B: Regression Analysis				
Gender Differences in Probability of Moving from Global Career Levels Controlling for Race, Ethnicity, Age, Education, Time at Oracle, Time in Grade By Year for IC3 and IC4				
From Career Level	**Year**	**N**	**Female Coefficient**	**Standard Deviation**
IC3	2013	628	-0.19	-1.30
IC3	2014	587	-0.13	-0.93
IC3	2015	555	-0.24	-1.63
IC3	2016	526	-0.21	-1.26
IC3	2017	474	-0.08	-0.51
IC3	2018	402	-0.24	-1.48
IC4	2013	1,133	-0.16	-1.37
IC4	2014	1,027	-0.10	-0.79
IC4	2015	1,019	-0.48	-3.46
IC4	2016	1,070	-0.18	-1.33
IC4	2017	1,014	-0.21	-1.49
IC4	2018	1,023	-0.01	-0.10

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70. For Asians in PRODEV, there are no statistically significant adverse outcomes in promotion on Dr. Madden's model and the two statistically significant outcomes are *positive*, as shown in the table below.

Madden Appendix B: Regression Analysis			
Race Differences in Probability of Moving from Global Career Levels Controlling for Race, Ethnicity, Age, Education, Time at Oracle, Time in Grade and Year, 2013-2018 - Asian vs. White in PRODEV -			
From Career Level	**N**	**Asian Coefficient**	**Standard Deviation**
IC1	81	-0.15	-0.28
IC2	1,241	-0.07	-0.31
IC3	2,689	0.02	0.23
IC4	5,291	0.00	-0.06
IC5	4,064	0.07	0.86
IC6	232	0.02	0.04
M2	534	0.51	2.06
M3	1,926	-0.05	-0.37
M4	1,941	-0.08	-0.74
M5	1,525	-0.09	-0.71
M6	434	0.47	1.98

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71. For African-Americans, there are no statistically significant adverse outcomes in promotion in Dr. Madden's model; the only statistically significant outcome is *positive*, as shown in the table below.

Madden Appendix B: Regression Analysis			
Race Differences in Probability of Moving from Global Career Levels Controlling for Race, Ethnicity, Age, Education, Time at Oracle, Time in Grade and Year, 2013-2018 - African-American vs. White in PRODEV -			
From Career Level	**N**	**African-American Coefficient**	**Standard Deviation**
IC1	25	40.78	--
IC2	102	1.21	2.27
IC3	433	0.37	1.09
IC4	1,178	0.19	0.70
IC5	1,369	0.12	0.26
IC6	116	--	--
M2	39	--	--
M3	306	0.83	1.79
M4	501	-0.04	-0.07
M5	531	--	--
M6	76	--	--
Note: Regression coefficients are not reported when there are fewer than 5 African-Americans.			

72. Taken as a whole, the results from running Dr. Madden's promotion models on all protected groups are inconsistent with an inference that career level or other work content variables are tainted by Oracle's managers. There is no basis to exclude such variables from the pay model.

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MY ANALYSIS SHOWS THAT ONCE THE CORRECT DEPENDENT VARIABLE IS USED AND MORE APPROPRIATE CONTROL VARIABLES ARE APPLIED, THERE IS NO PATTERN OF STATISTICALLY SIGNIFICANT ADVERSE PAY OUTCOMES FOR WOMEN, ASIANS, OR AFRICAN-AMERICANS

73. My initial report showed that there is no pattern of adverse pay outcomes by gender or race at Oracle once corrections were made to the OFCCP model. These results were based on a model of total compensation by job function controlling for total Oracle tenure (based on continuous service date that includes time worked at international affiliates or acquired firms), cumulative time spent on leave of absence and whether there was a leave of absence in the current year,[85] time in standard job title,[86] organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition. Job title and organization are controls applied to better compare the pay of employees doing similar work. Even though my model otherwise followed the structure of the OFCCP's SAC model (which as I explain in my initial report in paragraphs 10 to17 is problematic for several reasons), my analyses showed that there is no evidence of systematic adverse pay outcomes for women, Asians, and African-Americans at Oracle.[87]

[85] Dr. Madden does something similar in her models by deducting leaves of absence from her calculations of time worked at Oracle, and dropping employees from her analysis if they only worked part of the year.

[86] As I noted earlier, Dr. Madden does not explain why time in current position is included in her promotion models but not her pay models.

[87] Dr. Madden's base pay models for women and Asians are irrelevant, first because the OFCCP claims are about total compensation for women and Asians, and second because non-base salary at Oracle can be a large part of annual compensation. This is discussed in any number of Oracle manager training manuals (see for example, US Manager's Orientation presentation dated December 6, 2016 (ORACLE_HQCA_0000042091_MASTER US Manager Orientation 1201 (Native).PPTX) and is confirmed in the data itself (as explained in my initial report in paragraph 38 and charts on pages 90-91). For African-Americans, the OFCCP switched to claims about base pay in the SAC, and Dr. Madden's results including career levels show that the pay differences between whites and African-Americans are not statistically significant in four of the six years (and not the years in the audit window for OFCCP, 2013 and 2014).

74. In what follows, I provide further evidence that the variables I introduced in my initial report – and that I continue to use here – are appropriate, notwithstanding any unsupported allegation that they must be "tainted" by Oracle.

Oracle hires applicants into the organization they applied to

75. As noted in my previous report and repeated herein, there are no disparities in the rates at which women, Asians, and African-Americans get the jobs they apply to relative to men and whites. Thus, there is no basis for excluding standard job title and other information regarding job duties generally from a pay regression. There is simply no evidence to support the notion that Oracle "taints" the variables by arbitrarily "assigning" applicants to positions to which they have not applied. There are other variables within the Oracle data that also meaningfully relate to the nature of the work being performed by employees. For example, there are hundreds of different organizations at Oracle within which employees work at HQCA in the three job functions framed by the SAC, on hundreds of different products.[88] The requisitions make clear that even holding job title constant, different jobs draw on different sets of skills and experiences.[89] I used the variable "organization" in my analyses to capture these differences. For example, some organizations work on products and services designed to facilitate customers' data analytic efforts. See for example, one requisition describes a Software Developer 4 (IC4) open position in Fusion Release Engineering that requires database and SQL programming skills:

> "Technical Skills 1. Excellent problem solving and debugging skills 2. Strong Unix operating system skills. Previous technical support, system support or system admin experience is a plus 3. Experience with Oracle RDBMS, SQL and PL/SQL, Perl, Unix/Linux (including shell scripting) 4. Experience Apache web-servers, Weblogic server including app configuration and administration 5. Familiarity with Cloud

[88] Data shows that employees worked in 1,039 organizations. (July 2019 Report table C6).
[89] Attachment D to this report contains more sample requisitions. See also my initial report, paragraphs 47 through 61.

deployments and SaaS models 6. Programming experience in Java/ J2EE technology stack."[90]

76. In contrast, a requisition for the same standard job title – Software Developer 4 – but in the Active Data Guard organization calls for "Experience and/or interest in replication technologies and design trade-offs among consistency, availability and performance in distributed systems, C/C++ is desired."[91] Not only do the skills called for differ but their value to Oracle may differ as well.[92]

77. As noted here and in my previous report, standard job title and career level are broad categories that group employees by broad job descriptors (*e.g.*, software development or applications developer) and skill at dealing with organizational and technical complexity (career level), but these variables do not take into account what kind of products/services are worked on, the specific skills needed to develop or support those products/services, and what profit levels are associated with them, nor do they provide sufficient detail about employee job duties and responsibilities. This is one reason why the earnings ranges are so enormous within a given standard job title. If everyone sharing a standard job title were doing similar work, there would be no economically rational reason to pay one employee five times more than the person next to

[90] iRec Vacancy IRC2097743 in ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx
[91] iRec Vacancy IRC2161526 in ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx
[92] "Because not all products and services have the same value to Oracle, the value of the skills, duties, and responsibilities necessary to develop, enhance, or service Oracle's wide array of products and services also differs and changes over time. For example, and there are plenty more, twenty years ago, employees skilled in Siebel technologies were highly sought after in the marketplace. Today, by contrast, there is high demand for (and comparatively limited supply of) employees with experience specifically in cloud-based technologies and artificial intelligence. As technology continually changes and develops, the competition and market demand for employees skilled in the latest technologies also changes, meaning the value to Oracle of various skills, duties and knowledge also fluctuates over time." Miranda Declaration, paragraph 7. ORACLE_HQCA_0000607281.pdf

them. This outcome is a signal that the products and services worked on matter for understanding pay at Oracle.

78. I used organization as a variable in my previous report, which, while not perfect in that it is in part a financial cost center variable, does generally bear a closer relationship to the products and services being worked on than does standard job title alone. In this way, I group employees with those in the same organizations whose specific skills are likely to be more similar than the skills of employees in different organizations, whether it is software applications tailored to utilities, automotive logistics, or other industries, storage solutions that integrate hardware and software, cloud computing, or Big Data analysis. This refinement to better account for differences across organizations resembles the factors Dr. Madden and her University of Pennsylvania colleagues used to structure their own gender pay equity study (discussed above) – though in that study, Dr. Madden and colleagues actually estimated separate models by rank and department/school, in addition to controlling within those models for whether different academic departments were "high-pay, low-pay, or medium-pay."[93]My previous report showed applicants largely received the career level of the position they applied for. I turn next to considering the distribution of successful applicants among organizations relative to the organization to which they applied: i.e., did women, Asians, and African-Americans start working in the organization they applied to at the same rates as white men?

79. Almost three quarters of hires at Oracle headquarters into the PRODEV, INFTECH, and SUPPORT job functions in the relevant time period were of experienced employees – not new college hires – and those experienced hires responded to requisitions that were publicly posted.

[93] The Gender Equity Report, Executive Summary, p. V, and p. V, footnote 1. ALMANAC SUPPLEMENT December 4, 2001 (https://almanac.upenn.edu/archive/v48pdf/011204/GenderEquity.pdf).

There were 1,497 job requisitions in the data produced in the case that listed "organization." In order to study whether changes were made to "assign" different employees outside of the posted organization at rates that differed by race or gender, I conducted an analysis to compare the organization listed in these requisitions to the organization associated with the selected applicant's initial job at Oracle. The data show that 82.1% of women hired work in the same organization found in the requisition, versus 81.0% of men. The difference is tiny and not statistically significant. The same study for Asians results in 1,147 requisitions into which a white or Asian employee was hired; among these, 83.8% of Asians and 83.5% of white employees began work in the same organization as they applied to. Again, the difference is not statistically significant. There are 241 requisitions in the period against which either an African-American or white applicant was hired. There is very little difference: 80.0% of African-Americans and 83.5% of whites began work in the organization to which they applied. As with career level, here is simply no evidence that Oracle is "steering" employees with respect to organization. Thus, Dr. Madden had no basis to disregard the organization variable in her analyses. In my initial report I relied upon this variable in my pay analyses; and I do so again here.

Patent bonus award opportunities are also not "tainted"

80. Technology companies like Oracle have an incentive to patent as much of their work as possible in order to reap the benefits of their innovation. Patent-level work is potentially of enormous value to the company, and will generally correlate with high levels of skill and innovative ability not otherwise captured by measures like age or years since hire at Oracle.[94]

[94] Patents also serve as an objective measure of individual or group productivity, which can be especially useful in white collar positions where productivity is not otherwise directly observable. Ehrenberg and Smith (2015), *Modern Labor Economics* pp. 373-376.

81. There is no evidence to suggest that Oracle is steering women away from patent opportunities. Companies like Oracle have no economic incentive to suppress patent activity by anyone, given the enormous potential upside for innovative breakthroughs. As I noted in my previous report, Oracle maintains a central database of patents that all employees can search to understand the state of the art and who is working on various technologies. The patent application bonus is a fixed amount that has varied over the years but is capped at $4,500,[95] which is split by the team once the application passes through the internal review process. (The bonus is based on the application, not on whether the application successfully ends with an actual patent.) The data shows that 17.8% of HQCA employees working in PRODEV, INFTECH, and SUPPORT who ever received a patent bonus award between 2003 and 2018 are women.

82. To further analyze and interpret this finding, I downloaded the public national database of patents.[96] This dataset lists the company (or assignee) name, inventor name, patent class, as well as the application and issue date for a patent issued between 2003 and 2018. The dataset was then restricted to only the patents which listed Oracle as the company or assignee. This resulted in a dataset with 23,364 records, where each record includes a single inventor and patent. A total of 7,777 patents were identified as being assigned to Oracle indicating that, on average, there were approximately 3 inventors listed per patent assigned to Oracle. Although the gender of the inventor was not provided, a reasonable estimate could generally be identified using a prediction model for gender based on publicly available Social Security Administration data on names and gender. After the gender prediction model was applied to this dataset and those employees for

[95] Oracle Patent Refresher, July 8, 2014. (ORACLE_HQCA_0000414372_patent Primer 07-07-014.pptx.)

[96] https://patents.reedtech.com/pgrbbib.php. The full database includes patents from 1976 to 2018 and has approximately 16.5 million records of patents for over 1,000 different classifications, where each record is a unique pairing of a single inventor to a specific patent.

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whom a gender could be identified were examined, the analysis indicates that 11.8% of Oracle patent holders are women.[97]

83. Patents assigned to Oracle in that public national database fall into a subset of classification codes, depending on the place and time at which they were originally issued, and type of invention/method covered by the patent. When I restrict the full database to include only patents listed under one of these relevant classification codes (to track areas in which Oracle patents), and exclude any patents assigned to Oracle, the resulting data set includes 4,503,064 records for 1,623,837 patents. Of these remaining records, 12.6% of the patent holders are women, which is extremely close to the figure for women who are patent holders at Oracle.[98] In short, there is no evidence that Oracle is steering women away from patent activity or patenting opportunities relative to the rest of the industry.

84. The data produced by Oracle also show that of the employees who received a patent bonus at Oracle, 67.1% are Asian versus 30.0% who are white.[99] Although the public data from the U.S. patent office did not include inventor ethnicity, an ethnicity prediction model for ethnicity[100] was applied to inventor last names, in a comparable fashion to the prediction model used for gender. For the 23,364 records listing Oracle as the patent assignee, 42.6% of the inventors were Asian versus 45.2% who were white. A similar pattern can be seen in the

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[97] About 80% of records could be matched to the using the Social Security Administration (SSA) prediction model and approximately 63% could be matched using the census prediction model. Lincoln Mullen (2018). Gender: Predict Gender from Names Using Historical Data. R package version 0.5.2.

[98] If the census predictor in the R package (https://github.com/ropensci/gender) is used instead of the SSA predictor to determine gender, 13.2% of Oracle's patents are held by women versus 12.4% held by women at non-Oracle companies for patents listed under one of the classification codes covering patents assigned to Oracle.

[99] There are too few African-Americans to study patent activity.

[100] The approach is explained in: Kabir Khanna and Kosuke Imai (2019). wru: Who are You? Bayesian Prediction of Racial Category Using Surname and Geolocation. R package version 0.1-9. https://CRAN.R-project.org/package=wru

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4,503,064 patent records which fall under one of the classification codes for which Oracle has at least one patent. In these records 40.3% of patent holders are Asian versus 46.7% who are white. As with women, the percent of patent bonuses awarded by Oracle to Asians exceeds the percent of actual Oracle patents they hold and patent holders in these categories outside of Oracle who are Asian. These results are inconsistent with any assumption or claim that Oracle "steers" women or Asians away from opportunities that generate patent bonuses or result in patentable work. The failure to control for exceptional innovation and expertise (proxied by generating patent-able work) bias the gender and race coefficients in Dr. Madden's results (which do not flag patent activity), because the patent bonus data indicate that men and women at Oracle file for patents at different rates, as do Asian and white employees.[101]

Dr. Madden's measure of total compensation is incorrect

85. Total compensation is what matters to analysis of annual compensation decisions, not Medicare wages, which as I explained in my previous report in paragraphs 105 to 107, is not an accurate measure. But instead of identifying and analyzing the specific compensation awarded to each employee for work performed *in a given year* by summing up base pay, annual bonus, and shares or options awarded *in that year*, Dr. Madden uses pay that does not align stock awards to the year in which they were actually earned, and is affected by employee choices about how much to set aside in pre-tax deductions like medical or dependent care savings plans or whether to exercise stock options earned in previous years.

86. For example, as I noted in my last report, the employee with Person ID 891717010 worked full time, all year as a Software Developer 2 (IC2) in 2013. His base pay in Dr.

[101] See paragraphs 118 and 119 in my initial report.

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Madden's data was [redacted] his Regular Salary was [redacted][102] and his Medicare wages were [redacted] He earned [redacted]. Correctly calculated, this employee's total compensation in 2013 was $[redacted] Likewise, the employee with Person ID 10107 was a fulltime Senior Vice President for the entirety of 2014. His Medicare wages in Dr. Madden's dataset were [redacted] and base pay was [redacted] Her data also shows his 2014 Regular Salary was [redacted] and that he [redacted].[103] He was also awarded over [redacted] in stock. His Medicare wages were likely so much higher than the other measures indicate because he exercised stock options that he held from prior years; the data shows he exercised [redacted] of stock options.[104] That he decided to exercise those options in 2014 does not mean they represent his compensation for the work he did *in that same year*. His Medicare EE Taxable pay includes the delayed compensation he earned in other years but happened to cash in this particular year. Counting his base salary, bonuses and stocks awarded in 2014, this employee's total compensation was [redacted]not almost [redacted] To correctly measure total compensation associated with work in a given year, Dr. Madden should have used base pay plus bonuses earned and stock awarded within that year. She did not do so, rendering her total compensation comparisons inaccurate.

<u>There is no systematic pattern of adverse outcomes in incumbent pay when the regression models use the correct measure of pay and more appropriate control variables are applied</u>

87. The attached tables 1 through 5 show my results when total compensation is measured correctly, Dr. Madden's models are disaggregated by job function to track the allegations of the SAC, and additional variables better account for differences in employee skills and the type of

[102] This differs slightly from the amount I listed in my previous report because Dr. Madden uses Regular Salary from AllEarnings data file rather than Regular Earnings in the same data file.
[103] This differs slightly from the amount I listed in my previous report for the same reason.
[104] ORACLE_HQCA_0000070722_AllEarnings2.xlsx and ORACLE_HQCA_0000581403_Stock_Data_Product_Statement_Combined.xlsx

work they perform at Oracle are introduced. I have presented the results in a similar fashion to Dr. Madden. The first column shows the gender coefficient for total compensation controlling only for gender. The second column controls for race and ethnicity (as Dr. Madden includes this control in all her models).

88. Prior experience is measured as age minus total years at Oracle minus 22, as shown in column 3. Like Dr. Madden's age measure, this does not have much effect on the gender coefficient, does not account for the type of relevant experience, and does not account for years out of the labor force.[105]

89. Column 4 shows the results when education (using the variable adopted as constructed by Dr. Madden) is included in the model. Again, this variable is missing for many employees and in a non-random fashion, as described above.

90. Column 5 adds tenure variables: time in company (Oracle America, Inc.), part-time or full-time work, total Oracle tenure (including time at acquired companies and international affiliates), cumulative time spent on leave of absence and whether there was a leave of absence in current year[106], time in standard job title, and whether the employee arrived at Oracle as an experienced hire or through an acquisition (to account for incomplete leave of absence information, as described in my initial report in paragraph 113).

[105] Age minus 18 or age minus 22 are commonly used years of experience measures that count only year after high school or college graduation. (The OFCCP analyses used age minus 18.) I do not include a squared term because unlike many human capital analyses, we are analyzing company tenure with a more complete array of tenure variables that account for the eventual leveling off of the gains to experience but can be directly observed by Oracle managers and could be used by them in their decision making.

[106] Dr. Madden does something similar in her models by deducting leaves of absence from her calculations of time worked at Oracle, and dropping employees from her analysis if they only worked part of the year.

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91. Column 6 adds the job characteristic variables that are intended to better group employees with respect to their skills, duties, and responsibilities: standard job title, organization, and whether the employee has earned a patent bonus.

92. I have argued in this report as well as in my initial report that a number of the empirical outcomes, both statistical as well as descriptive, suggest that aggregation of all employees into one regression model may be inappropriate. I have also suggested that the use of standard job title does not capture the wide range of types of work that is covered by a single title. Putting these and other similar issues aside, and simply running an aggregated regression model that fixes flaws in Dr. Madden's model, and adds several variables she did not consider, I reach very different conclusions than she did. I find that gender and race pay differences shrink dramatically when compared to Dr. Madden's column 5 results, and even to Dr. Madden's column 8 results. Furthermore, the majority of the findings are not statistically significant. In fact, I find a number of positive relationships between total compensation and gender or race, respectively, undermining the claim that there is a consistent pattern of results adverse to women or minorities. These results do not support an inference of pay discrimination; instead, they are inconsistent with a hypothesis that Oracle systematically treats women, Asians, or African-Americans worse than white male employees with respect to pay in the PRODEV, INFTECH and SUPPORT job functions at its headquarters location.

Dr. Madden's analysis of starting pay is also flawed

93. Like the OFCCP, Dr. Madden claims that reliance on prior pay causes disparities in starting pay.[107] However, a regression coefficient is a measure of correlation, in that it indicates a relationship between two variables but does not necessarily show causality. One can regress

[107] Madden report, pp. 49-50.

height on shoe size, but the positive regression coefficient should not be interpreted to mean that as feet grow longer in length they cause the person to be taller. Showing that prior pay and starting pay are correlated is not enough; the claim is a *causal* one, that reliance on prior pay causes starting pay to be lower for women, Asians, and African-Americans.

94. As I noted in paragraph 144 of my initial report, the difficulty with studying prior pay and starting pay is that it is difficult to disentangle how much of the correlation is due to a pay practice of Oracle specifically (as the OFCCP charges) or instead how much is due to the fact that pay depends on a person's skills, experience, and how in demand those attributes are by competing companies. Starting pay and prior pay are strongly correlated throughout the economy. I reviewed National Longitudinal Survey (NLS) data on prior pay and starting pay for people who changed jobs.[108] The correlation between starting pay and prior pay is 0.75 across all individuals in the NLS, meaning that it is a factor economy-wide and not just at Oracle. In other words, Dr. Madden's results are also consistent with Oracle setting pay based on the specific relevant skills, abilities, and job experience an applicant brings to the position. Dr. Madden does not provide any empirical support for an essentially assumed explanation.

95. Dr. Madden's analysis of starting pay is also empirically flawed. Her analysis includes persons hired outside the three job functions at issue for women and for all three protected groups includes persons hired prior to the class period (i.e., before 2013) and non-headquarters locations. She also drops rehires and aggregates across job functions for women as well as across hire type (e.g., college hire, acquisition, or experienced hire). When we correct for these issues and add job title and organization for experienced hires in attached tables 6-14, Dr.

[108] The National Longitudinal Surveys (NLS) started in 1997 with 14-18 year olds and surveys them every year about a wide range of topics. My analysis examines job changes and the difference between the ending pay of the prior job and the starting pay of the new job. After limiting the data to exclude people changing occupation, changing part-time/full-time status, or who have extreme values of the reported hourly rates, I analyze data for 3,488 respondents.

Madden's results are the same as those I presented in my previous report, meaning that there is no pattern of starting pay decisions adverse to protected groups. The one exception has to do with female experienced hires in the PRODEV job function. This appears to have something to do with the missing education variable. When the analysis is restricted only to hires whose educational status is known, the result disappears. The sensitivity of this result leads me to conclude that it is an artifact of non-random missing information about the educational levels of hires rather than evidence of gender differences in starting pay.

No damages are owed because there is no pattern of pay disparity

96. Dr. Madden's primary analyses are in her Tables 1 to 3. Dr. Madden uses the statistical results of her flawed pay models for women, Asians, and African-Americans to formulaically arrive at aggregate damages figures owed to the protected groups she studies. Once steps are taken to correct the problems I identified above with Dr. Madden's analysis, there is no basis for estimating damages.

97. In Tables 8-10 of her July 2019 report, Dr. Madden calculates presumed damages under three scenarios: (i) controlling for age, education, and Oracle tenures and no Oracle variables, (ii) adding Oracle job descriptor, and (iii) then Global Career Level. These scenarios correspond to columns 5, 6, and 8 of Dr. Madden's tables 1-3. Her discussion regarding tainted variables makes clear that her opinion is that no Oracle variables should be included in pay analyses other than Oracle tenure. (This is represented by column 5 in her tables.) She fails to explain, then, why she calculates damages based on her column 6 and 8 results.

98. In her first scenario (using column 5), Dr. Madden applies the most extreme version of her human capital theory in which no job- or work-related variables like job title or organization are permissible to include; as a result of this flawed approach, she generates an enormous

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damages estimate of almost $800 million for all protected groups combined. As I have discussed at length above, leaving out all of the job- and work-related variables is scientifically unsupported, because she has no basis for her assumption that any and all company variables are hopelessly "tainted" by discrimination. Indeed, the empirical evidence contradicts rather than supports this assumption. In addition, the variables she does use, including the total compensation measure she uses (Medicare wages) are all flawed in the ways I have discussed.

99. Adding only the generic "job descriptor" variable to Dr. Madden's pay model does little to change the pay differences found in her column 5 models, and thus the "column 6" damages model generates a damages estimate of $710 million.

100. The final "column 8" damages estimate is based on a model that adds global career level. This estimate generates almost $300 million in damages. However, this model continues to be scientifically unsound, relies upon badly mis-measured variables, and compares employees who are not similar in terms of either their relevant skills and experience or the work they actually perform at Oracle. My refinements to Dr. Madden's analysis shows that when employees are more similarly situated, there are no pay disparities for protected groups even using function-wide aggregated models, and thus no damages are owed.

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CONCLUSION

101. It is my opinion that the analyses presented by Dr. Madden in support of OFCCP's allegations regarding pay at Oracle rely on unsupported assumptions instead of empirical research, utilize mis-specified models, rely upon incorrectly measured variables, suffer from omitted variable bias, and have a number of other methodological flaws. The variables on which her model relies are not sufficient to generate economically meaningful comparisons such that any gender- or race-based pay differences can be meaningfully assessed. Her *assumption* that any variables that are potentially subject to the influence of Oracle should be left out of the analysis is unsupported. Dr. Madden's analogy of statistical analysis in employment cases to statistical research in clinical trial settings, which she uses to support her assumption that variables omitted from analysis would not change her results if they were included is incorrect. Clinical data is generated by specific experimental design, while employment data is generated naturally and given to the researcher as is. As a result, it is my opinion that Dr. Madden's analyses do not support inferences of pay discrimination at Oracle and that they do not provide any basis for Dr. Madden's damages calculations. Assuming for argument's sake that Dr. Madden's level of aggregation of the data is appropriate, and using the standard job title and other variables as provided in the Oracle data, my analyses of pay do not support an inference of a pattern of pay discrimination against women, Asians, and African Americans. In addition, my analyses indicate that there is no evidence of bias in the process by which job applicants are hired into the positions they apply for in terms of both career level and organization, that there is no evidence of bias in promotions, and that there is no evidence of bias in starting pay, or pay growth at Oracle. Given these statistical conclusions, it is my opinion that there is no basis for OFCCP's claim that economic damages are owed by Oracle in this case.

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Executed August 16, 2019 in Los Angeles, California.

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Ali Saad, Ph.D.

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Table 1

2013 through 2018 Gender Differences in Total Compensation at Oracle Headquarters by Year, with Various Characteristics Controlled

- Full-Year Incumbents in the INFTECH Job Function -

			Controls for …											
			Gender Only (1)		Adds Race/Ethnicity (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Refined Tenure Variables (5)		Adds Work-Related Variables (6)	
Year	Number of Workers	% Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
2013	440	28.2%	-0.061	-1.53	-0.071	-1.78	-0.071	-1.78	-0.072	-1.78	-0.029	-0.69	-0.034	-1.73
2014	447	27.7%	-0.081	-1.76	-0.086	-1.88	-0.086	-1.88	-0.080	-1.74	-0.014	-0.27	-0.033	-1.39
2015	556	24.5%	-0.123	-2.86	-0.122	-2.89	-0.123	-2.89	-0.123	-2.89	-0.046	-0.99	-0.035	-1.55
2016	604	23.7%	-0.131	-3.16	-0.132	-3.22	-0.132	-3.24	-0.135	-3.29	-0.070	-1.56	-0.009	-0.42
2017	544	24.3%	-0.138	-2.95	-0.140	-3.04	-0.140	-3.04	-0.142	-3.05	-0.051	-1.03	-0.037	-1.52
2018	521	24.4%	-0.146	-3.09	-0.148	-3.16	-0.148	-3.16	-0.149	-3.17	-0.073	-1.45	-0.063	-2.48

Note on controls:

(3) Refined age variable is estimated by age minus 22 minus total Oracle years.
(5) Refined tenure variables are: time in company (Oracle America), part-time/full-time, total oracle tenure (including time at acquisition and non-USA affiliate), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, and whether the employee arrived at oracle as an experienced hire or through an acquisition.
(6) Work-related variables are: job title, organization, and whether the employee ever has a patent bonus.

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Table 2

2013 through 2018 Gender Differences in Total Compensation at Oracle Headquarters by Year, with Various Characteristics Controlled

- Full-Year Incumbents in the PRODEV Job Function -

			Controls for …											
			Gender Only (1)		Adds Race/Ethnicity (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Refined Tenure Variables (5)		Adds Work-Related Variables (6)	
Year	Number of Workers	% Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
2013	3,901	28.8%	-0.239	-15.38	-0.226	-14.64	-0.226	-14.63	-0.226	-14.75	-0.184	-12.19	-0.017	-2.05
2014	3,872	28.7%	-0.252	-14.24	-0.239	-13.58	-0.239	-13.62	-0.241	-13.75	-0.199	-11.65	-0.013	-1.33
2015	3,814	28.3%	-0.242	-13.83	-0.228	-13.13	-0.230	-13.21	-0.233	-13.44	-0.191	-11.01	-0.015	-1.48
2016	3,809	27.7%	-0.232	-13.39	-0.221	-12.84	-0.222	-12.88	-0.227	-13.20	-0.194	-11.44	-0.015	-1.57
2017	3,816	27.6%	-0.245	-13.28	-0.236	-12.82	-0.237	-12.86	-0.242	-13.23	-0.208	-11.48	-0.009	-0.83
2018	3,585	27.9%	-0.249	-12.71	-0.242	-12.45	-0.242	-12.46	-0.246	-12.70	-0.214	-11.14	-0.009	-0.86

Note on controls:

(3) Refined age variable is estimated by age minus 22 minus total Oracle years.
(5) Refined tenure variables are: time in company (Oracle America), part-time/full-time, total oracle tenure (including time at acquisition and non-USA affiliate), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, and whether the employee arrived at oracle as an experienced hire or through an acquisition.
(6) Work-related variables are: job title, organization, and whether the employee ever has a patent bonus.

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Table 3

2013 through 2018 Gender Differences in Total Compensation at Oracle Headquarters by Year, with Various Characteristics Controlled

- Full-Year Incumbents in the SUPPORT Job Function -

			Controls for …											
			Gender Only (1)		Adds Race/Ethnicity (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Refined Tenure Variables (5)		Adds Work-Related Variables (6)	
Year	Number of Workers	% Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
2013	233	18.0%	-0.205	-3.00	-0.215	-3.12	-0.225	-3.23	-0.236	-3.40	-0.199	-2.73	-0.051	-2.01
2014	220	19.1%	-0.186	-2.36	-0.198	-2.46	-0.214	-2.65	-0.220	-2.73	-0.137	-1.64	-0.056	-2.29
2015	103	30.1%	-0.187	-1.41	-0.184	-1.33	-0.210	-1.50	-0.214	-1.48	-0.111	-0.68	0.016	0.31
2016	95	24.2%	-0.175	-1.11	-0.187	-1.16	-0.211	-1.26	-0.203	-1.19	-0.125	-0.58	0.178	1.55
2017	85	23.5%	-0.154	-0.83	-0.162	-0.85	-0.185	-0.92	-0.165	-0.81	-0.080	-0.34	-0.032	-0.31
2018	83	25.3%	-0.169	-0.96	-0.178	-0.99	-0.235	-1.22	-0.215	-1.10	-0.067	-0.29	0.132	1.14

Note on controls:

(3) Refined age variable is estimated by age minus 22 minus total Oracle years.
(5) Refined tenure variables are: time in company (Oracle America), part-time/full-time, total oracle tenure (including time at acquisition and non-USA affiliate), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, and whether the employee arrived at oracle as an experienced hire or through an acquisition.
(6) Work-related variables are: job title, organization, and whether the employee ever has a patent bonus.

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Table 4

2013 through 2018 Asian Differences in Total Compensation at Oracle Headquarters by Year, with Various Characteristics Controlled

- Full-Year Incumbents in the PRODEV Job Function -

			Controls for …											
			Asian Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Refined Tenure Variables (5)		Adds Work-Related Variables (6)	
Year	Number of Workers	% Asian	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value
2013	3,783	72.6%	-0.177	-11.04	-0.157	-10.03	-0.156	-9.54	-0.150	-9.10	-0.102	-6.58	-0.010	-1.17
2014	3,756	73.6%	-0.186	-10.04	-0.166	-9.15	-0.173	-9.15	-0.169	-8.84	-0.121	-6.78	-0.010	-0.94
2015	3,687	74.6%	-0.178	-9.67	-0.158	-8.73	-0.169	-8.97	-0.166	-8.73	-0.121	-6.69	-0.006	-0.54
2016	3,659	75.9%	-0.155	-8.30	-0.137	-7.50	-0.144	-7.63	-0.138	-7.22	-0.095	-5.19	-0.005	-0.47
2017	3,669	76.9%	-0.145	-7.23	-0.128	-6.52	-0.134	-6.57	-0.118	-5.74	-0.079	-3.99	-0.011	-0.96
2018	3,435	77.5%	-0.165	-7.59	-0.150	-7.00	-0.154	-6.98	-0.141	-6.31	-0.113	-5.24	-0.025	-2.08

Note on controls:
(3) Refined age variable is estimated by age minus 22 minus total Oracle years.
(5) Refined tenure variables are: time in company (Oracle America), part-time/full-time, total oracle tenure (including time at acquisition and non-USA affiliate), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, and whether the employee arrived at oracle as an experienced hire or through an acquisition.
(6) Work-related variables are: job title, organization, and whether the employee ever has a patent bonus.

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Table 5

2013 through 2018 African-American Differences in Total Compensation at Oracle Headquarters by Year, with Various Characteristics Controlled

- Full-Year Incumbents in the PRODEV Job Function -

			Controls for …											
			African-American Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Refined Tenure Variables (5)		Adds Work-Related Variables (6)	
Year	Number of Workers	% African-American	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value
2013	1,062	2.4%	-0.277	-2.63	-0.264	-2.55	-0.273	-2.65	-0.285	-2.76	-0.238	-2.50	-0.016	-0.31
2014	1,018	2.6%	-0.396	-3.37	-0.379	-3.26	-0.394	-3.41	-0.414	-3.58	-0.368	-3.45	-0.036	-0.57
2015	962	2.6%	-0.421	-3.70	-0.402	-3.56	-0.417	-3.72	-0.439	-3.92	-0.391	-3.70	-0.073	-1.15
2016	910	3.2%	-0.435	-4.20	-0.414	-4.02	-0.427	-4.18	-0.433	-4.23	-0.351	-3.61	-0.080	-1.34
2017	876	3.1%	-0.466	-4.03	-0.440	-3.83	-0.447	-3.92	-0.440	-3.85	-0.375	-3.44	-0.066	-1.02
2018	800	3.4%	-0.464	-3.67	-0.445	-3.55	-0.449	-3.59	-0.438	-3.50	-0.391	-3.26	-0.077	-1.06

Note on controls:
(3) Refined age variable is estimated by age minus 22 minus total Oracle years.
(5) Refined tenure variables are: time in company (Oracle America), part-time/full-time, total oracle tenure (including time at acquisition and non-USA affiliate), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, and whether the employee arrived at oracle as an experienced hire or through an acquisition.
(6) Work-related variables are: job title, organization, and whether the employee ever has a patent bonus.

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Table 6

2013 through 2018 Gender Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires in INFTECH, PRODEV, and SUPP Job Functions -

			Controls for …											
			Gender Only (1)		Adds Race (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Job Function	Number of Workers	Number of Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
INFTECH	283	57	-0.122	-2.77	-0.131	-3.12	-0.131	-3.37	-0.128	-3.29	-0.133	-3.46	-0.022	-1.01
PRODEV	1,817	383	-0.150	-8.70	-0.149	-8.84	-0.135	-9.35	-0.135	-9.84	-0.137	-10.10	-0.015	-2.22
SUPP	42	7	0.130	0.86	0.009	0.07	-0.073	-0.67	-0.087	-0.77	-0.047	-0.38	-0.006	-0.04

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 7

2013 through 2018 Gender Differences in Starting Base Salary at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires with Recorded Education Characteristics in INFTECH, PRODEV, and SUPP Job Functions -

			Controls for …											
			Gender Only (1)		Adds Race (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Job Function	Number of Workers	Number of Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
INFTECH	211	45	-0.108	-2.41	-0.117	-2.63	-0.122	-2.95	-0.121	-2.95	-0.126	-3.10	-0.024	-0.92
PRODEV	34	5	-0.126	-7.01	-0.125	-7.05	-0.116	-7.70	-0.119	-7.84	-0.123	-8.34	-0.015	-1.85
SUPP	1,281	273	-0.010	-0.07	0.004	0.03	-0.068	-0.58	-0.079	-0.66	-0.057	-0.44	-0.006	-0.04

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 8

2013 through 2018 Asian Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires in the PRODEV Job Function -

Controls for …													
		Asian Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Number of Workers	Number of Asians	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value
1,661	1,292	-0.115	-6.59	-0.110	-6.47	-0.001	-0.08	0.002	0.15	-0.004	-0.25	0.000	0.03

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 9

2013 through 2018 Asian Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires with Recorded Education Characteristics in the PRODEV Job Function -

Controls for …													
		Asian Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Number of Workers	Number of Asians	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value
1,172	929	-0.096	-5.14	-0.092	-5.08	0.020	1.21	0.018	1.06	0.008	0.48	0.004	0.41

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 10

2013 through 2018 African-American Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires in the PRODEV Job Function -

Controls for …													
		African-American Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Number of Workers	Number of African-Americans	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value
377	8	-0.413	-3.25	-0.402	-3.24	-0.351	-3.02	-0.320	-2.91	-0.318	-2.88	-0.099	-1.52

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 11

2013 through 2018 African-American Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- Experienced Hires with Recorded Education Characteristics in the PRODEV Job Function -

Controls for …													
		African-American Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Work-Related Variables (6)	
Number of Workers	Number of African-Americans	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value
249	6	-0.529	-4.26	-0.500	-4.19	-0.444	-3.90	-0.431	-3.78	-0.420	-3.69	-0.104	-1.32

Note on controls:
(3) Refined age variable is estimated by age minus 22.
(6) Work-related variables are: job title and organization.

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Table 12

2013 through 2018 Gender Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- College Hires in the PRODEV Job Function -

Controls for …													
		Gender Only (1)		Adds Race (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Global Career Level (6)	
Number of Workers	Number of Women	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value	Gender Coefficient	T-Value
664	212	0.011	1.60	0.010	1.45	0.017	3.00	0.014	2.48	0.008	1.75	0.007	1.61

Note on controls:
(3) Refined age variable is estimated by age minus 22.

There are too few college hires in the INFTECH and SUPP job functions to run regressions.

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Table 13

2013 through 2018 Asian Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- College Hires in the PRODEV Job Function -

Controls for …													
		Asian Only (1)		Adds Gender (2)		Adds Previous Experience (3)		Adds Refined Age Variable (3)		Adds Hire Year (5)		Adds Global Career Level (6)	
Number of Workers	Number of Asians	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value	Asian Coefficient	T-Value
628	592	-0.005	-0.34	-0.005	-0.35	-0.004	-0.36	-0.002	-0.14	0.001	0.06	-0.011	-1.26

Note on controls:
(3) Refined age variable is estimated by age minus 22.

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Table 14

2013 through 2018 African-American Differences in Starting Base Pay at Oracle Headquarters by Year, with Various Characteristics Controlled
- College Hires in the PRODEV Job Function -

Controls for …													
		African-American Only (1)		Adds Gender (2)		Adds Refined Age Variable (3)		Adds Education (4)		Adds Hire Year (5)		Adds Global Career Level (6)	
Number of Workers	Number of African-Americans	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value	African-American Coefficient	T-Value
49	13	-0.045	-1.07	-0.040	-0.93	0.014	0.49	0.024	0.85	-0.013	-0.48	-0.008	-0.35

Note on controls:
(3) Refined age variable is estimated by age minus 22.

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Attachment A: Saad CV and Testimony

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ALI SAAD, Ph.D., MANAGING PARTNER

Dr. Saad is the Managing Partner of Resolution Economics LLC. He has a Ph.D. in Economics from the University of Chicago. Prior to Resolution Economics, Dr. Saad was a partner at Deloitte & Touche LLP and at Altschuler, Melvoin and Glasser LLP. Before that he was in the disputes consulting group at Price Waterhouse, first in New York, and then in Los Angeles. Prior to his consulting career, Dr. Saad served as an Assistant Professor of Economics at Baruch College of the City University of New York (CUNY).

Professional Experience

Dr. Saad's experience is extensive in the area of statistical and economic analysis of liability and damages related to employment litigation matters. His experience is extensive in the application of economics and statistical methods to class action employment discrimination matters. He is also experienced in designing, implementing, and analyzing surveys and observation studies as well as conducting empirical analyses related to exempt/non-exempt status, hours worked, uncompensated time, meal and rest breaks, rounding, and other wage and hour issues. He has also performed statistical and damages analyses for a broad range of commercial litigation matters including breach of contract, insurance coverage, environmental claims, patent infringement, antitrust and real estate financing. Dr. Saad has testified a number of times at deposition and trial. Dr. Saad also regularly consults to clients regarding business issues related to employment practices.

Employment Matters

Dr. Saad provides a variety of services related to employment litigation. His experience is extensive in conducting statistical and economic analysis related to issues of liability for employment discrimination matters. He also has designed and conducted many surveys and observational studies related to wage and hour issues. Dr. Saad has also performed analyses of economic damages in both class action and single plaintiff matters.

Statistical and Economic Analysis in Discrimination Matters

Assignments representative of Dr. Saad's experience in performing analyses in connection with employment discrimination matters include the following:

- Consulting and expert witness services in national class action race discrimination matter involving issues of pay, promotion, work assignment, and a variety of other challenged employment practices. Services included creating databases from diverse and voluminous source materials, and conducting extensive statistical analyses.

- Consulting and expert witness services in national class action gender discrimination matter involving issues of job assignment and promotion. Services included creating databases from diverse and voluminous source materials, and conducting extensive statistical analyses.

- Consulting and expert witness services in a class action case alleging that contracts were misleading. Services included processing and analyzing large quantities of data, and performing statistical analysis of the criteria determining class membership.

- Consulting and expert witness services in connection with a major class action alleging gender discrimination in pay and promotion at a large high-tech employer. Services included creating analytical databases, and developing economic and statistical arguments concerning the relationship between productivity-related variables, pay/promotion, and gender.

- Consulting and expert witness services in an antitrust and discrimination matter in which a group of businesses alleged violations of antitrust and discrimination laws by another group of businesses. Services included data construction, and statistical analysis related to issues of liability.

- Consulting and expert witness services on behalf of plaintiffs' counsel in a series of cases alleging race discrimination in hiring. Services included creating analytical databases, studying the relationship between race and hiring, and examining the features of the external labor market.

- Consulting and expert witness services in connection with a class action claim of discrimination based on age in connection with a series of layoffs resulting from the combination of two large retail chains. Services included creating analytical databases, studying the relationship between layoff and age, and examining the relationship between age and workforce composition over.

- Consulting and expert witness services in connection with EEOC allegations of race discrimination in recruiting, hiring, and initial placement at a large service providing company. Services included developing databases from diverse paper and electronic sources, and providing statistical arguments concerning the relationship between race and various other factors.

- Consulting and expert witness services to defendant's counsel in connection with a major class action alleging gender discrimination in multiple employment practices at a national retail chain. Services included developing a database from voluminous paper documents, and conducting analysis related to hiring, initial placement, and initial pay.

- Consulting and expert witness services to defendant's counsel in connection with an EEOC investigation of racial discrimination in hiring by a major service providing organization. Services included developing a database, and conducting statistical analysis related to hiring.

- Consulting services to defendant's counsel in connection with a U.S. Department of Labor OFCCP investigation of pay equity at a high-tech company. Services included design and oversight of a statistical analysis of pay equity, assessment of the OFCCP methodology, and participation in conciliation discussions between the company and the OFCCP.

- Consulting and expert witness services to defendant's counsel in connection with an allegation of age discrimination in terminations resulting from a series of mass layoffs. Services provided included developing statistical arguments concerning the relationship between age and termination.

- Consulting services to defendant's counsel in connection with a Department of Justice investigation regarding allegations of racial profiling by a large city police department. Analyzed departmental data related to over 130,000 traffic stops, pedestrian stops, and other types of police contacts that occurred in four selected weeks in 1997 and four selected weeks in 1999. Cross-referenced traffic stops data with other information sources including human resources data, precinct level paper records, and the officer discipline system to test various hypotheses.

- Consulting services and expert testimony to defendant's counsel in connection with a multi-plaintiff matter alleging race and gender discrimination in promotion and placement into coveted positions by a large city police department. Performed statistical analysis of promotion and placement into coveted positions. Quantified economic damages for several plaintiffs under failure to promote and wrongful termination theories.

- Consulting services in a case against a city government alleging discrimination in recruiting and hiring of police and firefighters. Services included using Census and other large-scale data sources to assess labor market characteristics by detailed geographic location, and conducting extensive analysis of the impact of employment tests on hiring.

- Consulting and expert witness services to defendant's counsel in a matter where plaintiff alleged that defendant's hiring practices discriminated against women. Services included converting diverse paper source materials into a usable database, and developing statistical evidence concerning plaintiff's allegation.

- Consulting services in several class action recruiting and hiring matters. Services included use of detailed census and other data to estimate labor market availabilities by geographic location, and analyzing employment practices in light of these availability findings.

- Consulting services to a major bank involved in an analysis of its fair lending practices. Services included using bank data on applicants for mortgages and other loans, and adding various demographic and geographic information to assess if the bank made loans on the basis of race, or controlling for other, observable factors could explain patterns in loan making.

- Consulting services on behalf of defendant's counsel in a major class action matter involving allegations of gender discrimination in promotion. Services included building analytical database from many sources, using the database to conduct extensive statistical analysis of plaintiffs' allegations, and estimating damages resulting from non-promotion for approximately 3,000 women occupying different jobs over a ten-year period.

- Consulting and expert witness services on behalf of defendant's counsel in two related cases alleging age discrimination in termination. Prior to plaintiffs' vesting for certain long term benefits. Services included using defendant's human resource data to test plaintiffs' specific allegations, developing statistical arguments concerning the relationship between age and termination, and performing analyses of plaintiff's damages in each case.

- Consulting services on behalf of plaintiff's counsel in distribution of award in an age discrimination matter with 75 plaintiffs. Services included developing a method to efficiently compute damages for all plaintiffs, and working with counsel, an arbitrator, and plaintiffs' committee to explain the process to plaintiffs' group.

Wage and Hour Matters

Assignments representative of Dr. Saad's experience in wage and hours matters include:

- Consulting and expert witness services to defense counsel in a national class-action wage and hour matter alleging that several thousand loan originators at a large financial institution were misclassified under FLSA. Conducted statistical analyses of hours worked records, compensation data, plaintiffs' declarations, and other data to determine if select groups of plaintiffs would be representative of the class.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several thousand General Managers and Assistant Managers at a large office supply retailer were misclassified as exempt employees. Services included designing and conducting a survey to examine whether class members were appropriately classified, analyzing the company's labor model and human resources data, and conducting statistical analyses related to a variety of class certification issues.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several thousand Assistant Managers at a large general merchandise retailer were misclassified as exempt employees. Services included designing and conducting both a survey and an observational study, to examine whether or not class members were appropriately classified. Services also included conducting extensive statistical analyses of the data collected by the survey and the observational study, and preparing materials for use in class certification proceedings.

- Consulting services to defense counsel in a class action matter alleging failure to pay overtime wages to independent sales and service representatives for a large national tool franchiser. Services included designing and implementing an hours survey to determine whether the additional hours worked claimed by some plaintiffs was representative of the additional hours worked by the class as a whole. Determined that the problem was isolated to certain geographic areas rather than nationwide.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several hundred store managers and assistant store managers at a chain of retail discount stores were misclassified. Services included creating and implementing a survey to examine whether class members were classified appropriately and conducting statistical analyses related to commonality of class-members and other class certification issues.

- Consulting services to defense counsel in a multi-plaintiff wage and hour matter alleging that the defendant employer failed to compensate security guards for uniform changing time and other claims of off-the-clock work. Services included designing and conducting an observation study to measure time associated with various activities.

- Consulting services to defense counsel in wage and hour matter alleging that store managers at a chain of convenience store/ gas station operations were misclassified as exempt workers. Services included designing and conducting a random sampling scheme and observational study to evaluate the amount of time that class members spent on exempt and non-exempt duties.

- Consulting services to defense counsel in a class-action wage and hour matter alleging uncompensated meal periods and breaks, unpaid overtime wages, and minimum wage violations at a field maintenance company.

Services included creating a database of hours worked from paper and electronic records, and then providing damages estimates based on a variety of assumptions and legal theories.

- Consulting services to defense counsel in a class action matter alleging a variety of wage and hour violations for hourly workers at a chain of warehouse stores. Services included analyzing data to test allegations of improper time adjustments, missed meal and rest periods, uncompensated split shifts, reporting time violations, overtime and regular rate issues, and off-the-clock work.

Employment Damages

Assignments representative of Dr. Saad's experience estimating economic damages include the following:

- Consulting services to plaintiff's counsel in a case involving a breach of employment contract allegation by a high-level executive in the emerging communications industry. Services included damages analysis based on valuation of stock options and estimation of future earnings.

- Consulting services to defendant's counsel in a case involving a wrongful termination allegation by a high-level executive in the telecommunication industry. Services included damages analysis based on valuation of stock options using the Black-Scholes Option Pricing Framework and a Monte Carlo Simulation Model.

- Consulting and expert witness services on behalf of defendant's counsel in a matter brought by a former executive who alleged wrongful termination and age discrimination against a major defense contractor following a reduction in force. Critiqued work product of the opposing expert, evaluated mitigation issues, calculated loss of earnings damages and valued losses related to stock options.

- Consulting and expert witness services on behalf of defendant's counsel in a medical malpractice action where the underlying damages issue was valuing an income stream from a closely held cash business. Performed accounting of plaintiff's financial records to determine the existence and the extent of fraud. Created financial models to calculate damages under a variety of scenarios.

- Consulting and expert witness services to defendant's counsel in a wrongful termination matter brought by senior executive of a high-tech company who alleged age discrimination. Performed analysis of mitigation factors, calculated loss of earnings, and valued future stock options.

Commercial Litigation

Dr. Saad has assisted clients in a variety of commercial litigation matters, including patent infringement, insurance coverage, antitrust, breach of contract, and real estate financing. Assignments representative of Dr. Saad's experience in these areas include the following:

- Consulting and expert witness services in a series of cases involving the real property title insurance industry. Services included performing extensive statistical analyses in connection with both liability and damages issues.

- Consulting and expert witness services in a case alleging breach of loan commitment to a commercial real estate concern. Services included constructing financial models, developing economic arguments relating to fixed versus variable rate loans, and assisting counsel in deposing the opposing expert.

- Consulting and expert witness services in a case involving a breach of contract allegation in the computer hardware industry. Services consisted of performing a damages calculation, and rebutting the opposing expert's analysis.

- Consulting and expert witness services in a case alleging that one entity caused another entity's property to be misused. Services included database creation, and statistical analysis related to issues of causation. Results indicated that there was a statistically significant relationship between defendant's actions and plaintiff's economic condition.

- Consulting services on behalf of defendant's counsel in a breach of contract matter in the context of natural resource raw materials shipping. Services included developing economic arguments regarding the but-for pricing of both the shipping service as well as the material being shipped.

- Consulting and expert witness services on behalf of defendant's counsel in a major insurance coverage case, in which the underlying claims resulted from tens of thousands of asbestos claims. Services included developing strategy for dealing with large amounts of paper information, creating a database for analysis, and performing a variety of statistical analyses.

- Consulting services on behalf of plaintiff's counsel in an antitrust matter in the consumer electronics product market. The antitrust practice alleged was predatory pricing. Services included preparing a damage analysis.

- Consulting services on behalf of defendant's counsel in a patent infringement matter in the computer hardware industry. Services included researching transfer pricing issues and analyzing complex company P&L data in preparation for damages calculation.

- Consulting services on behalf of defendant's counsel in a real estate financing dispute. Dispute revolved around the financing of a major New York office property. Services included analysis of interest rates and their relationship to potential damages at various points in time, as well as the construction of a financial model of the property with the but-for financing in place.

- Consulting services on behalf of plaintiff's counsel in an antitrust matter involving allegations of non-competitive practices and predatory pricing in the home cable television market. Services included an analysis of "raising rivals costs", as well as a statistical analysis of pricing of complex products over time.

Summary of Employment Experience

Resolution Economics LLC:
Managing Partner, October 1998 to date.

University of Southern California
Adjunct Associate Professor in the Department of Economics**,** January 1999 to September 2001.

Deloitte & Touche, LLP:
Partner, Dispute Consulting Services, (Los Angeles), 1998.

Altschuler, Melvoin and Glasser LLP:
Partner, Economics and Litigation Services, (Los Angeles), 1995 to 1998.

Price Waterhouse LLP:
Senior Manager, Manager, Litigation and Corporate Recovery Services Group, (New York and Los Angeles), January 1989 – November 1989, June 1990 to 1995.

Olympia & York Companies (USA):
Assistant VP and Senior Economist, (New York), November 1989 - June 1990.

Baruch College, City University of New York (CUNY):

Instructor and Assistant Professor of Economics, Department of Economics and Finance, 1982-1988; Center for the Study of Business and Government, Research Associate, 1983-1986; U.S. Small Business and Veterans Administrations, Consultant, 1985-1986.

Education

Ph.D., Economics, The University of Chicago.

B.A., History, Economics, The University of Pennsylvania

Publications

Financial Success and Business Ownership among Vietnam and other Veterans (with S. Lustgarten) SBA - 7210 - VA - 83, 1986.

"Schooling and Occupational Choice in 19th Century Urban America", Journal of Economic History, vol. 49, no. 2, June 1989.

"Employment Discrimination Litigation", chapter in Litigation Services Handbook, ed. by Roman Weil, et al., 1995, 2001, 2006, 2012, 2017.

“Employment Discrimination”, chapter in Litigation Support Report Writing, ed. by Jack P. Friedman, et al, 2003.

Paul Grossman, Paul Cane, and Ali Saad, "Lies, Damned Lies, and Statistics: How the Peter Principle Warps Statistical Analysis of Age Discrimination Claims", The Labor Lawyer, vol. 22, no. 3, Winter/Spring 2007, pp. 251-268.

Saad, Ali, "Beyond the Peter Principle – How Unobserved Heterogeneity in Employee Populations Affects Statistical Analysis in Age Discrimination Cases: Application to a Termination/RIF Case", AELC Conference Volume, 2007.

Saad, Ali, "Filling the Data Vacuum in Wage and Hour Litigation: The Example of Misclassification Cases, Emphasis on Class Certification", SIOP Annual Conference Proceedings, 2009.

Saad, Ali, "Wage and Hour Cases - Filling the Data Vacuum: Misclassification Cases and Other Observational Studies", SIOP Annual Conference Proceedings, 2012.

Presentations

Dr. Saad has delivered many presentations at professional conferences, to law firms and to industry groups.

Academic Honors

Finalist, Allan Nevins National Doctoral Dissertation Award
NIMH Doctoral Fellowship, The University of Chicago
Magna Cum Laude, The University of Pennsylvania
Honors in History, Economics, The University of Pennsylvania
Omicron Delta Epsilon, Honor Society in Economics

Professional Affiliations

American Economic Association
American Bar Association (associate membership)

Ali I. Saad, Ph.D.
Attachment to Resume

Last Four Years of Testimony:

In the matter of Scott, et al., v. Airport Management Services, et al., Case No: BC593927 (Superior Court for the State of California, County of Los Angeles) in connection with wage and hour claims. Report filed March 21, 2019. Deposition April 17, 2019.

In the matter of Cortina, et al., v. North American Title Company, Case no. 07 CE CG 01169 JH, (Superior Court of the State of California, County of Fresno), in connection with class action employment matter. Reports filed May 11, 2012, June 25, 2012, and August 13, 19, 21, and 26, 2015. Deposition September 8 and 9, 2015. Trial testimony December 3 and December 10, 2015. Hearing testimony March 14, April 12, May 18, July 12, 2018, September 18, 2018, November 26th, 2018, May 1, 2019.

In the matter of Jewett, et al., v. Oracle America, Inc., Case No: 17-CIV-02669 (Superior Court for the State of California, County of San Mateo) in connection with class action employment discrimination claims. Report filed March 6, 2019. Deposition Testimony March 18, 2019.

In the matter of Smiles, et al., v. Walgreen Company, et al., Case No: RG-17862495 (Superior Court for the State of California) in connection with wage and hour claims. Report filed February 22, 2019, deposition testimony February 25, 2019.

In the matter of Kennard v. Reeves, Case No: BD 604 788 (Superior Court for the State of California) in connection with reasonable compensation issues. Reports filed January 28, 2019 and February 4, 2019. Arbitration Testimony February 22, 2019, May 20, 2019.

In the matter of EEOC, et al., v. Jackson National Life Insurance, et al., Case No: 16-CV-2472-PAB-SKC, (United States District Court for the District of Colorado) in connection with class action discrimination claims. Reports filed August 31, 2018, October 26, 2018 and June 28, 2019. Deposition July 18, 2019.

In the matter of Leanna Delgado v. California Commerce Club, Inc., et al., Case No: BC 586727, (Superior Court for the State of California for the County of Los Angeles) in connection with allegations of age discrimination. Deposition July 25, 2018.

In the matter of Hall v. Rite Aid Corporation, Case No. 37-2009-00087938-CU-OE-CTL, (Superior Court for the State of California for the Country of San Diego) in connection with suitable seating claims. Deposition January 20, 2012, Report filed on June 11, 2018.

In the matter of Harris, et al., v. Union Pacific, Case No: 8:16-cv-381, (United States District Court For the District of Nebraska) in connection with class action discrimination claims. Report filed May 3, 2018. Deposition May 23, 2018.

In the matter of Henderson, et al., v. JP Morgan Chase, Case No. 11-CV-03428 (PLAx), (United States District Court For the Central District of California) in connection with wage and hour claims. Report filed February 26, 2018. Deposition March 21, 2018.

In the matter of Moussouris, et al., v. Microsoft, Case No. 15-CV-1483 (JLR), (United States District Court for the Western District of Washington) in connection with class action claims of gender discrimination in pay, performance and promotions. Reports filed January 5, 2018, April 6, 2018 and April 25, 2018. Deposition January 30, 2018.

In the matter of Creative Artists Agency LLC, v. Martin Lesak, et al., JAMS Ref nos. 120032335, 336 and 337 (Arbitral Tribunal of JAMS) in connection with breach of contract claims. Deposition January 16 and 21, 2018 and March 19, 2018. Arbitration testimony March 26, April 16, and September 7, 2018.

In the matter of Negrete, et al., v. Conagra Foods, Inc., Case No. 2:16-cv-631-FMO-AJW, (United States District Court For the Central District of California) in connection with class action wage and hour claims. Report filed February 28, 2018. Deposition April 18, 2018. Revised report filed on June 18, 2018 to respond to a revised report filed by plaintiff's expert.

In the matter of Woods, et al., v. JFK Memorial Hospital, Inc., Case No. INC 1205209, (Superior Court of California, County of Riverside), in connection with wage and hour claims. Report filed October 13, 2017. Deposition November 29, 2017.

In the matter of Bridewell-Sledge, et al., v. Blue Cross of California, et al., Case No. BC 477 451 c/w BC 481 586, (Superior Court of California, County of Los Angeles), in connection with employment discrimination claims. Reports filed September 7, 2017 and June 13, 2018. Deposition October 30, 2017.

In the matter of Truitt, et al., v. Atlanta Independent School System, Case No. 1:15-cv-4295-SCJ-WEJ, (United States District Court, Northern District of Georgia, Atlanta Division), in connection with allegations of employment discrimination. Report filed August 31, 2017. Deposition September 20, 2017.

In the matter of Williams, et al., v. TGI Fridays, Inc. Case No. 15-cv-0426, (United States District Court, Northern District of Illinois), in connection with allegations of wage and hour violations. Report filed August 4, 2017, deposition August 25, 2017.

In the matter of Victor Cejka, et al., v. Vectrus Systems Corporation, et al. Case No. 15-cv-02418-MEH, (United States District Court, District of Colorado), in connection with alleged employment damages. Report filed July 17, 2017, Rebuttal report filed August 14, 2017. Trial testimony June 18, 2018.

In the matter of EEOC, v. GMRI, Inc. Case No. 15-cv-20561-JAL, (United States District Court, Southern District of Florida, Miami Division), in connection with allegations of employment discrimination. Report filed April 21, 2017, deposition June 8, 2017.

In the matter of Bowerman, et al., v. FAS, Civil Action No. 13-00057-WHO, (United States District Court, Northern District of California), in connection with wage and hour allegations. Rebuttal Report filed April 6, 2017, deposition April 11, 2017.

In the matter of Romero, et al., v. Allstate Insurance Company, et al., Consolidated Cases, Civil Action No. 01-3894-MAK, (United States District Court, Eastern District of Pennsylvania), in connection with employment discrimination allegations. Rebuttal Report filed March 20, 2017, deposition March 29, 2017.

In the matter of Urbano, et al., v. SMG Holdings, et al., Case No.: 5:15-cv-00603-MMM (MRW), (United States District Court for the Central District of California), in connection with wage and hour allegations. Report filed October 14, 2016, deposition October 26, 2016.

In the matter of In re: AutoZone, Inc., Wage and Hour Employment Practices Litigation, Case No.: 3:10-cv-02159-CRB (JSC), (United States District Court for the Northern District of California), in connection with wage and hour allegations. Report filed April 29, 2016, deposition May 27, 2016.

In the matter of EEOC v. Texas Roadhouse, Inc., et al. Case No.:1:11-cv-11732 (United States District Court for the District of Massachusetts), in connection with allegations of age discrimination. Reports filed April 22, 2016 and July 20, 2016. Deposition June 17, 2016; trial testimony January 26, 2017.

In the matter of Luanna Scott, et al., v. Family Dollar Stores, Inc., Case No.:3:08-cv-540 (United States District Court for the Western District of North Carolina), in connection with allegations of gender discrimination. Reports filed January 28, 2016, May 31, 2016. Deposition February 10, 2016.

In the matter of Valerie Horvath v. Western Refining Wholesale, Inc., Case no. Case No.:CIV-ds1311846 (Superior Court for the State of California, County of San Bernardino), in connection with allegations of age discrimination. Report filed November 19, 2015. Deposition January 14, 2016.

In the matter of Curley, et al., v. Savemart, et al. Case no RG13685740, (Superior Court of California, County of Alameda), in connection with class action wage and hour matter. Report filed September 2, 2015. Deposition December 18, 2015 and January 20, 2016.

In the matter of Hurt, et al., v. Commerce Energy, Inc, et al., Case no. 1:12-CV-00758, (United States District Court for the Northern District of Ohio), regarding analysis of data in connection with federal and state class action wage and hour claims. Reports filed May 29 and June 17, 2014. Deposition June 24, 2014. Trial testimony May 22, 2018.

Attachment B: Data and Documents Considered

Attachment B – Data and Documents Considered

I. Court Documents

OFCCP's Responses to Oracle's Request for Production, Second Set (Amended), April 5, 2019

Order Granting Oracle's Motion to Compel Plaintiff to Designate and Produce 30(b)(6) Witnesses, July 1, 2019

Order Denying Defendant Oracle's Motion to Compel Plaintiff OFCCP's Further Response to Requests for Admission and Order Directing OFCCP to State Position with Respect to Oracle Managers, August 8, 2019

II. Depositions and Declarations

Videotaped Deposition of Shirong (Andy) Leu, July 1, 2019

Videotaped Deposition of Michael Brunetti, July 17, 2019

Videotaped Deposition of Kate Waggoner, July 19, 2019

- Exhibits 7-8, 13, 80- 81, 84-86, 88-89, 120

III. Oracle Documents

ORACLE_HQCA_0000056234 (2016_Managing_Compensation_July_2016_v3.ppt)

IV. Expert Reports

Expert Report of Ali Saad, PhD, In the matter of Office of Federal Contract Compliance Programs, United States Department of Labor, Plaintiff, v. Oracle America, Inc., Defendant. July 19, 2019

- 364 files in backup production

Expert Report of Janice Fanning Madden, PhD, Analysis of Gender and Racial Differences in Compensation At Oracle, 2013-2018. July 19, 2019

- 273 files in backup production

V. OFCCP Produced Documents

DOL000043013.pdf

DOL000043023.pdf

CONFIDENTIAL

DOL000043232.pdf

DOL000043241.pdf

DOL000043537.pdf

DOL000043552.pdf

VI. Literature

Angrist, Joshua D., and Jörn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con out of Econometrics." *Journal of Economic Perspectives*, 24 (2): 3-30.

Cameron, A. Colin, and Pravin K. Trivedi. *Microeconometrics: Methods and Applications*. Cambridge University Press, 2005. Pp. 48-52.

Heckman, James J., Robert J. LaLonde, and Jeffrey A. Smith. "The economics and econometrics of active labor market programs." *Handbook of Labor Economics*, vol. 3, pp. 1865-2097. Elsevier, 1999.

Hicks, Charles. (1982) Fundamental Concepts in the Design of Experiments, p. 5.

Imbens, Guido W., and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." Journal of Economic Literature, 47 (1): 5-86.

Madden, Janice Fanning. "Gender differences in the cost of displacement: An empirical test of discrimination in the labor market." *The American Economic Review* 77, no. 2 (1987): 246-251, p. 246.

Madden, Janice Fanning. "The Persistence of Pay Differentials: The Economics of Sex Discrimination." Women and Work: An Annual Review (Beverly Hills: Sage Publications, 1985), pp. 76-114.

VII. Online Cites and Other Data

GitHub – ropensci/gender: Predict Gender from Names Using Historical Data. (https://github.com/ropensci/gender), accessed on August 12, 2019.

Kabir Khanna and Kosuke Imai (2019). wru: Who are You? Bayesian Prediction of Racial Category Using Surname and Geolocation. R package version 0.1-9. (https://CRAN.R-project.org/package=wru), accessed on August 8, 2019.

Lincoln Mullen (2018). Gender: Predict Gender from Names Using Historical Data. R package version 0.5.2.

Linkedin: [redacted] (https://www.linkedin.com/in/[redacted]o-a61a4a1), accessed on August 12, 2019.

Linkedin: [redacted] (https://www.linkedin.com/in/[redacted]5a1823), accessed on August 12, 2019.

National Center for Education Statistics, Table 322.40. Bachelor's degrees conferred to males by postsecondary institutions, by race/ethnicity and field of study: 2014-15 and 2015-16 (https://nces.ed.gov/programs/digest/d17/tables/dt17_322.40.asp), accessed on August 12, 2019.

National Center for Education Statistics, Table 322.50. Bachelor's degrees conferred to females by postsecondary institutions, by race/ethnicity and field of study: 2014-15 and 2015-16. (https://nces.ed.gov/programs/digest/d17/tables/dt17_322.50.asp), accessed on August 12, 2019.

Oracle Job Search (https://oracle.taleo.net/careersection/2/jobsearch.ftl?lang=en), accessed on August 12, 2019.

Reed Tech USPTO Data Sets. (https://patents.reedtech.com/pgrbbib.php), accessed on August 8, 2019.

The Gender Equity Report, Executive Summary, p. V, and p. V, footnote 1. ALMANAC SUPPLEMENT December 4, 2001 (https://almanac.upenn.edu/archive/v48pdf/011204/GenderEquity.pdf).

Attachment C: Fields of Study by Gender and Race (NCES)

Bachelor's degrees conferred to males by postsecondary institutions, by race/ethnicity and field of study: 2014-15

Field of study	N			%		
	White	Black	Asian	White	Black	Asian
All fields, total	**530,418**	**69,316**	**58,848**	**100.0%**	**100.0%**	**100.0%**
Agriculture and natural resources	14,723	470	492	2.8%	0.7%	0.8%
Architecture and related services	3,133	263	392	0.6%	0.4%	0.7%
Area, ethnic, cultural, gender, and group studies	1,100	299	233	0.2%	0.4%	0.4%
Biological and biomedical sciences	27,536	2,615	7,298	5.2%	3.8%	12.4%
Business	123,703	16,629	12,918	23.3%	24.0%	22.0%
Communication, journalism, and related programs	21,367	3,825	1,108	4.0%	5 5%	1.9%
Communications technologies	2,026	419	163	0.4%	0.6%	0.3%
Computer and information sciences	30,156	4,584	5,236	5.7%	6.6%	8.9%
Construction trades	177	4	4	0.0%	0.0%	0.0%
Education	14,342	1,675	393	2.7%	2.4%	0.7%
Engineering	50,463	2,945	8,467	9.5%	4 2%	14.4%
Engineering technologies and engineering-related fields[1]	10,149	1,326	593	1.9%	1 9%	1.0%
English language and literature/letters	10,138	1,032	524	1.9%	1 5%	0.9%
Family and consumer sciences/human sciences	1,813	455	228	0.3%	0.7%	0.4%
Foreign languages, literatures, and linguistics	4,019	235	316	0.8%	0 3%	0.5%
Health professions and related programs	21,105	3,604	3,525	4.0%	5 2%	6.0%
Homeland security, law enforcement, and firefighting	20,808	5,048	951	3.9%	7 3%	1.6%
Legal professions and studies	850	167	59	0.2%	0 2%	0.1%
Liberal arts and sciences, general studies, and humanities	10,530	2,521	507	2.0%	3.6%	0.9%
Library science	13	3	0	0.0%	0.0%	0.0%
Mathematics and statistics	7,554	495	1,347	1.4%	0.7%	2.3%
Mechanic and repair technologies/technicians	264	29	14	0.0%	0.0%	0.0%
Military technologies and applied sciences	164	26	2	0.0%	0.0%	0.0%
Multi/interdisciplinary studies	10,050	1,851	946	1.9%	2.7%	1.6%
Parks, recreation, leisure, and fitness studies	17,886	2,910	1,062	3.4%	4 2%	1.8%
Philosophy and religious studies	5,022	474	344	0.9%	0.7%	0.6%
Physical sciences and science technologies	13,203	704	1,589	2.5%	1.0%	2.7%
Precision production	25	0	3	0.0%	0.0%	0.0%
Psychology	15,977	3,032	1,955	3.0%	4.4%	3.3%
Public administration and social services	3,375	1,295	239	0.6%	1 9%	0.4%
Social sciences and history	55,483	6,562	5,505	10.5%	9 5%	9.4%
Social sciences	42,363	5,786	5,011	8.0%	8 3%	8.5%
History	13,120	776	494	2.5%	1 1%	0.8%
Theology and religious vocations	5,499	419	144	1.0%	0.6%	0.2%
Transportation and materials moving	3,065	271	136	0.6%	0.4%	0.2%
Visual and performing arts	24,700	3,129	2,155	4.7%	4 5%	3.7%
Other and not classified	0	0	0	0.0%	0.0%	0.0%

[1] Excludes "Construction trades" and "Mechanic and repair technologies/technicians," which are listed separately.

NOTE: Data are for postsecondary institutions participating in Title IV federal financial aid programs. Race categories exclude persons of Hispanic ethnicity. Reported racial/ethnic distributions of students by level of degree, field of degree, and sex were used to estimate race/ethnicity for students whose race/ethnicity was not reported. To facilitate trend comparisons, certain aggregations have been made of the degree fields as reported in the Integrated Postsecondary Education Data System (IPEDS): "Agriculture and natural resources" includes Agriculture, agriculture operations, and related sciences and Natural resources and conservation; and "Business" includes Business, management, marketing, and related support services and Personal and culinary services. Some data have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2015 and Fall 2016, Completions component. (This table was prepared August 2017.)

Bachelor's degrees conferred to females by postsecondary institutions, by race/ethnicity and field of study: 2014-15

Field of study	N			%		
	White	Black	Asian	White	Black	Asian
All fields, total	**679,653**	**123,513**	**70,079**	**100.0%**	**100.0%**	**100.0%**
Agriculture and natural resources	14,514	612	828	2.1%	0 5%	1.2%
Architecture and related services	2,172	179	443	0.3%	0 1%	0.6%
Area, ethnic, cultural, gender, and group studies	2,457	836	479	0.4%	0.7%	0.7%
Biological and biomedical sciences	38,014	5,684	9,614	5.6%	4.6%	13.7%
Business	98,803	22,555	12,689	14.5%	18 3%	18.1%
Communication, journalism, and related programs	38,464	6,437	2,343	5.7%	5 2%	3.3%
Communications technologies	1,083	198	123	0.2%	0 2%	0.2%
Computer and information sciences	5,354	1,577	1,541	0.8%	1 3%	2.2%
Construction trades	9	0	1	0.0%	0.0%	0.0%
Education	57,349	5,589	1,504	8.4%	4 5%	2.1%
Engineering	11,452	981	2,635	1.7%	0.8%	3.8%
Engineering technologies and engineering-related fields[1]	1,185	300	94	0.2%	0 2%	0.1%
English language and literature/letters	22,476	2,646	1,220	3.3%	2 1%	1.7%
Family and consumer sciences/human sciences	14,061	2,732	1,078	2.1%	2 2%	1.5%
Foreign languages, literatures, and linguistics	8,051	677	790	1.2%	0 5%	1.1%
Health professions and related programs	124,339	21,339	12,247	18.3%	17 3%	17.5%
Homeland security, law enforcement, and firefighting	13,688	7,426	577	2.0%	6.0%	0.8%
Legal professions and studies	1,751	569	106	0.3%	0 5%	0.2%
Liberal arts and sciences, general studies, and humanities	17,292	3,962	956	2.5%	3 2%	1.4%
Library science	66	7	0	0.0%	0.0%	0.0%
Mathematics and statistics	5,510	520	949	0.8%	0.4%	1.4%
Mechanic and repair technologies/technicians	16	2	0	0.0%	0.0%	0.0%
Military technologies and applied sciences	37	8	0	0.0%	0.0%	0.0%
Multi/interdisciplinary studies	19,050	3,789	1,768	2.8%	3 1%	2.5%
Parks, recreation, leisure, and fitness studies	16,302	2,174	952	2.4%	1.8%	1.4%
Philosophy and religious studies	2,728	360	237	0.4%	0 3%	0.3%
Physical sciences and science technologies	7,274	806	1,322	1.1%	0.7%	1.9%
Precision production	6	2	4	0.0%	0.0%	0.0%
Psychology	53,895	11,604	5,275	7.9%	9.4%	7.5%
Public administration and social services	15,717	6,351	779	2.3%	5 1%	1.1%
Social sciences and history	45,108	9,611	5,912	6.6%	7.8%	8.4%
Social sciences	36,757	8,912	5,531	5.4%	7 2%	7.9%
History	8,351	699	381	1.2%	0.6%	0.5%
Theology and religious vocations	2,285	366	69	0.3%	0 3%	0.1%
Transportation and materials moving	382	47	36	0.1%	0.0%	0.1%
Visual and performing arts	38,763	3,567	3,508	5.7%	2 9%	5.0%
Other and not classified	0	0	0	0.0%	0.0%	0.0%

[1] Excludes "Construction trades" and "Mechanic and repair technologies/technicians," which are listed separately.

NOTE: Data are for postsecondary institutions participating in Title IV federal financial aid programs. Race categories exclude persons of Hispanic ethnicity. Reported racial/ethnic distributions of students by level of degree, field of degree, and sex were used to estimate race/ethnicity for students whose race/ethnicity was not reported. To facilitate trend comparisons, certain aggregations have been made of the degree fields as reported in the Integrated Postsecondary Education Data System (IPEDS): "Agriculture and natural resources" includes Agriculture, agriculture operations, and related sciences and Natural resources and conservation; and "Business" includes Business, management, marketing, and related support services and Personal and culinary services. Some data have been revised from previously published figures.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2015 and Fall 2016, Completions component. (This table was prepared August 2017.)

Attachment D: Sample of 20 Job Requisitions for Software Developer 4

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1425737

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	1425737
DATE FROM	11/10/2010
VACANCY NAME	IRC1425737
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	
TALEO REQ NUMBER	
MANAGER ID	156035
MANAGER	Girkar, Mr Mahesh Baburao
ORGANIZATION NAME	Data Guard Development

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1425737

Field	Text
DEPARTMENT DESCRIPTION	The position is for an individual contributor for softwaredesign and development in the Data Guard Development Group at the Oracle Headquarters in Redwood Shores, California.The Data Guard Development Group consists of about 15 people, working in theOracle Database Server organization. Our development environment isprimarily C and Oracle PL/SQL programming on Linux and Windows. Below is a brief description of the Data Guard technology that the group workson... Oracle Data Guard is the most effective, highest performing, and mostcomprehensive data availability, data protection, and disaster recoverysolution for enterprise databases. Data Guard is the management,monitoring, and automation software infrastructure that creates, maintains, andmonitors one or more standby databases to protect enterprise data fromfailures, disasters, errors, and corruptions. Available as a feature of the Enterprise Edition of the Oracle Database, DataGuard can be used in combination with other Oracle High Availability (HA)solutions such as Real Application Clusters (RAC) and Recovery Manager (RMAN),to provide a high level of data protection, data availability, and resourceutilization that is unprecedented in the industry.Data Guard is the industry-leading disaster recoverysolution, and is deployed by thousands of the most visible Oracle customers intheir mission critical environments. The world's largest banks and financial institutions, such as Bank ofAmerica, the largest internet companies, such as Amazon.com, and world'slargest telecom companies, such as China Mobile and Briitish Telecom, all useData Guard to protect their databases.Future Data Guard projects include greateravailability through the extension of zero data-loss protection to databasesthat are geographically separated across continents, greater performancethrough additional scalability, and greater utilization of standby databasesthrough the very popular Active Data Guard option.You can learn more about the Oracle Data Guard technology at: http://www.oracle.com/technology/deploy/availability/htdocs/DataGuardOverview.htmlData Guard is a very high profile development project within the OracleDatabase development organization, and the development team is highly skilledand well respected within the company. We are recognized as innovators,and have developed many patented ideas and features in the high availabilityarea. Development team members comefrom varied backgrounds, but work very well together as a team to deliver ahigh quality product. Our development work is complex and non-routine,and you will be challenged in new ways every day.
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1425737

Field	Text
DETAILED DESCRIPTION	As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems.
JOB REQUIREMENTS	Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.
ADDITIONAL DETAILS	We are looking for self-motivated individuals, who can deal with complex problems under limited supervision. Our projects are driven by customer requirements and by innovative ideas that percolate from the bottom-up as well as top-down. We are looking for talented software engineers who can come up with innovative ideas, build consensus around them, and deliver solutions in a timely fashion. The following skills are valued:Highly proficient in C. Proficiency in SQL, PL/SQL a plusBackground in relational database and operating system concepts Good understanding of concurrent programming concepts Strong software engineering and debugging skills Ability to work under tight deadlines and yet deliver a quality product Ability to work with a group that is geographically dispersed
INTERNAL POSTING START DATE	11/10/2010
INTERNAL POSTING END DATE	06/02/2011
EXTERNAL POSTING START DATE	11/10/2010
EXTERNAL POSTING END DATE	06/02/2011
TALEO DESCRIPTION EXT 1	
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	.
TALEO INTERNAL CLOSE DATE	.

Vacancy ID: 1425737

Field	Text
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1683737

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	1683737
DATE FROM	01/06/2012
VACANCY NAME	IRC1683737
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	
TALEO REQ NUMBER	
MANAGER ID	149168
MANAGER	Ou, Mr Yuanjiang (Jerry Yuanjiang)
ORGANIZATION NAME	Corporate Architecture
DEPARTMENT DESCRIPTION	Team develops, tests and releases Oracle Enterprise Linux and Oracle Virtualization solutions.
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc.
DETAILED DESCRIPTION	As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems.
JOB REQUIREMENTS	Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.
ADDITIONAL DETAILS	The responsibilities include- participating in the complete cycle of Oracle VM development- working closely and effectively with the entire development team- analyzing product feature design and implementation, proposing effective and complete testing solutions- designing and developing the test case, and coordinating product QA effortRequired expertise - Strong programming skills in Java, python, Shell Script- Excellent knowledge of Linux OS and other Operation Systems- Experience with Oracle VM product and other virtualization products a big plus.- Excellent verbal and written communication skills- Hands on experience in network and storage configuration- Experience with Oracle ADF, Object Oriented Design and application server such as Weblogic a big plus
INTERNAL POSTING START DATE	01/06/2012
INTERNAL POSTING END DATE	07/06/2012

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1683737

Field	Text
EXTERNAL POSTING START DATE	01/06/2012
EXTERNAL POSTING END DATE	07/06/2012
TALEO DESCRIPTION EXT 1	
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	.
TALEO INTERNAL CLOSE DATE	.
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1759717

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	1759717
DATE FROM	04/11/2012
VACANCY NAME	IRC1759717
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	
TALEO REQ NUMBER	
MANAGER ID	891168424
MANAGER	Wilbourn, Robert (Sandy)
ORGANIZATION NAME	Business Intelligence/Enterprise Program Management Group
DEPARTMENT DESCRIPTION	The Business Intelligence/Enterprise Program Management group is responsible for building innovative products, which includes extensive innovative visualizations, sophisticated data modeling, and the ability to analyze the data for sophisticated business questions without building specific, narrow applications that require programming. We are building a next generation system to support new visualizations, support exploratory analysis of big data, predictive analysis, and OLAP integration, innovative use of in-memory database data structures. This project has executive focus and high visibility because of the market potential and competitive marketplace for BI solutions as the types of analysis that customers want explode with different data scenarios. Exalytics, our engineered solution for BI and specifically the visualizations that we implemented for this environment were featured in several keynotes at the last Oracle OpenWorld.
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc.
DETAILED DESCRIPTION	As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems.
JOB REQUIREMENTS	Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 1759717

Field	Text
ADDITIONAL DETAILS	The engineer who fits this role will work with both our Presentation Services group as well as our BI Server group to define the new constructs used in our next generation product as well as how these new concepts are implemented using technologies that support in-memory analysis, interactive analysis as well as mobile technologies. Being successful in this role will require several different technologies and languages, so having a passion for building software products and solving complex computer science related problems is more important than allegiance to a specific technology or language. Preferred Skills and Experience:Experience with building products from inception to delivery in the BI domain is required.Excellent problem solving and analytical skills as well as good verbal and written communication skillsTechnologically savvy, innovative, passionate on learning emerging technology5+ years experience in a commercial software development environmentBachelor's degree in Computer Science/Computer Engineering or Master's preferred
INTERNAL POSTING START DATE	04/11/2012
INTERNAL POSTING END DATE	06/30/2012
EXTERNAL POSTING START DATE	04/11/2012
EXTERNAL POSTING END DATE	06/30/2012
TALEO DESCRIPTION EXT 1	
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	.
TALEO INTERNAL CLOSE DATE	.
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2536454

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2536454
DATE FROM	06/09/2014
VACANCY NAME	IRC2536454
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	14000C88
MANAGER ID	893273867
MANAGER	Taha, Abe
ORGANIZATION NAME	Oracle Marketing Cloud
DEPARTMENT DESCRIPTION	On April 2, Oracle completed the acquisition of BlueKai.BlueKai is the industry's leading cloud-based big data platform that enables companies to personalize online, offline and mobile marketing campaigns with richer and more actionable information about targeted audiences. BlueKai's Data Management Platform (DMP) centrally organizes a company's customer and audience data in the cloud to help implement personalized marketing campaigns across all channels and deliver better results and higher marketing ROI. BlueKai also runs the world's largest 3rd party data marketplace to augment a customer's proprietary data with actionable information on more than 700 million profiles. Approximately 300 customers across multiple industries rely on BlueKai to maximize their marketing investment.The Oracle Marketing Cloud is an integral part of the Oracle Customer Experience Cloud which includes commerce, sales, service, social and marketing. Together, the Oracle Customer Experience Cloud enables a seamless and integrated exceptional customer experience from the first touch point through the entire customer lifecycle. The BlueKai team brings significant knowledge and capabilities to Oracle and is expected to continue facilitating excellence in data-driven marketing at Oracle.
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2536454

Field	Text
DETAILED DESCRIPTION	As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems.
JOB REQUIREMENTS	Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
ADDITIONAL DETAILS	Responsibilities: Collaborate in a team based environment to define, drive and deliver how Blue Kai's customers can program with dataExcellent communication skillsLearn and implement state of the art analytics and stream processing solutionsOwn the end-to-end lifecycle; design, test, build, deploy, run and scale features and infrastructure that fuels multiple business modelsDrive agile methods and best practices for web-scale code and operationsHas experience in and enjoys leveraging open-source solutionsQualifications:5+ years of software development experienceExpert Java and network programming skills and willing to learn moreExcellent working knowledge of the Java ecosystem including the JDK and commons APIExperience with the Unix/Linus environmentProficient in shell and at least one scripting languageExperience in building resilient and 'recovery oriented' systemsExperience with Amazon's EC2 and S3 product offeringsExperience with analytics on Big Data solutions, including Hadoop and other NoSQL solutions. MUST HAVE BS/MS in computer science or related fieldBonusExperience deploying and operating large scale, 24x7 transactional and offline processesSQL, stored procedures, data normalization techniques and database management
INTERNAL POSTING START DATE	06/09/2014
INTERNAL POSTING END DATE	12/31/2014
EXTERNAL POSTING START DATE	06/09/2014
EXTERNAL POSTING END DATE	12/31/2014

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2536454

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2536454

Field	Text
TALEO QUALIFICATION EXT 1	On April 2, Oracle completed the acquisition of BlueKai. BlueKai is the industry's leading cloud-based big data platform that enables companies to personalize online, offline and mobile marketing campaigns with richer and more actionable information about targeted audiences. BlueKai's Data Management Platform (DMP) centrally organizes a company's customer and audience data in the cloud to help implement personalized marketing campaigns across all channels and deliver better results and higher marketing ROI. BlueKai also runs the world's largest 3rd party data marketplace to augment a customer's proprietary data with actionable information on more than 700 million profiles. Approximately 300 customers across multiple industries rely on BlueKai to maximize their marketing investment. The Oracle Marketing Cloud is an integral part of the Oracle Customer Experience Cloud which includes commerce, sales, service, social and marketing. Together, the Oracle Customer Experience Cloud enables a seamless and integrated exceptional customer experience from the first touch point through the entire customer lifecycle. The BlueKai team brings significant knowledge and capabilities to Oracle and is expected to continue facilitating excellence in data-driven marketing at Oracle. Responsibilities: - Collaborate in a team based environment to define, drive and deliver how Blue Kai's customers can program with data - Excellent communication skills - Learn and implement state of the art analytics and stream processing solutions - Own the end-to-end lifecycle; design, test, build, deploy, run and scale features and infrastructure that fuels multiple business models - Drive agile methods and best practices for web-scale code and operations - Has experience in and enjoys leveraging open-source solutions Qualifications: - 5+ years of software development experience - Expert Java and network programming skills and willing to learn more - Excellent working knowledge of the Java ecosystem including the JDK and commons API - Experience with the Unix/Linus environment - Proficient in shell and at least one scripting language - Experience in building resilient and 'recovery oriented' systems - Experience with Amazon's EC2 and S3 product offerings - Experience with analytics on Big Data solutions, including Hadoop and other NoSQL solutions. - MUST HAVE BS/MS in computer science or related field Bonus - Experience deploying and operating large scale, 24x7 transactional and offline processes - SQL, stored procedures, data normalization techniques and database management
TALEO QUALIFICATION EXT 2	

Vacancy ID: 2536454

Field	Text
TALEO QUALIFICATION INT 1	On April 2, Oracle completed the acquisition of BlueKai. BlueKai is the industry's leading cloud-based big data platform that enables companies to personalize online, offline and mobile marketing campaigns with richer and more actionable information about targeted audiences. BlueKai's Data Management Platform (DMP) centrally organizes a company's customer and audience data in the cloud to help implement personalized marketing campaigns across all channels and deliver better results and higher marketing ROI. BlueKai also runs the world's largest 3rd party data marketplace to augment a customer's proprietary data with actionable information on more than 700 million profiles. Approximately 300 customers across multiple industries rely on BlueKai to maximize their marketing investment. The Oracle Marketing Cloud is an integral part of the Oracle Customer Experience Cloud which includes commerce, sales, service, social and marketing. Together, the Oracle Customer Experience Cloud enables a seamless and integrated exceptional customer experience from the first touch point through the entire customer lifecycle. The BlueKai team brings significant knowledge and capabilities to Oracle and is expected to continue facilitating excellence in data-driven marketing at Oracle. Responsibilities: - Collaborate in a team based environment to define, drive and deliver how Blue Kai's customers can program with data - Excellent communication skills - Learn and implement state of the art analytics and stream processing solutions - Own the end-to-end lifecycle; design, test, build, deploy, run and scale features and infrastructure that fuels multiple business models - Drive agile methods and best practices for web-scale code and operations - Has experience in and enjoys leveraging open-source solutions Qualifications: - 5+ years of software development experience - Expert Java and network programming skills and willing to learn more - Excellent working knowledge of the Java ecosystem including the JDK and commons API - Experience with the Unix/Linus environment - Proficient in shell and at least one scripting language - Experience in building resilient and 'recovery oriented' systems - Experience with Amazon's EC2 and S3 product offerings - Experience with analytics on Big Data solutions, including Hadoop and other NoSQL solutions. - MUST HAVE BS/MS in computer science or related field Bonus - Experience deploying and operating large scale, 24x7 transactional and offline processes - SQL, stored procedures, data normalization techniques and database management
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	09JUN14:04:00:00
TALEO INTERNAL CLOSE DATE	01JAN15:02:59:00

Vacancy ID: 2536454

Field	Text
TALEO EXTERNAL OPEN DATE	09JUN14:04:00:00
TALEO EXTERNAL CLOSE DATE	01JAN15:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2769626

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2769626
DATE FROM	12/27/2014
VACANCY NAME	IRC2769626
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	140015IX
MANAGER ID	890230629
MANAGER	Shobe, Eric B
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Oracle Labs
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	12/27/2014

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2769626

Field	Text
INTERNAL POSTING END DATE	06/27/2015
EXTERNAL POSTING START DATE	12/27/2014
EXTERNAL POSTING END DATE	06/27/2015
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2769626

Field	Text
TALEO QUALIFICATION EXT 1	Oracle Labs is looking for a candidate with background in embedded software development. Experience of Linux internals, device drivers, and system management at a server level is ideal. Development and debug of silicon, bring-up boards and software in a laboratory setting should be familiar. The candidate must be proficient with C, C++ and assembly. Additionally, the candidate must show proficiency in developing and debugging low-level software that includes boot code, device drivers and diagnostics. The desired candidate would have direct experience with as many of the following as possible: Preferred Skills: - Experience with service processors or embedded firmware on Linux (porting, drivers, root filesystems, etc) - Experience with ILOM or BMC management - New SoC and Board Bringup Experience. Implementation of debug and device drivers is a must. - Bus protocols: I2C/SPI/Ethernet/PCIE understanding - Very strong C development / Linux Environment - Experience with Subversion, Git, and other software versioning tools - Knowledge of languages relevant to the development process, including Perl and/or Python and Unix scripting. Finally, a successful candidate must be a versatile and skilled software developer and be able to debug at various levels of engagement in the bringup, development, and deployment of an SOC. Oracle Labs is the only dedicated research organization within Oracle and reports directly to the Chief Corporate Architect. Oracle Labs mission is straightforward: Identify, explore, and transfer new technologies that have the potential to substantially improve Oracle's business. Oracle's commitment to R&D is a driving factor in the development of technologies that have kept Oracle at the forefront of the computer industry. The Mission of Oracle Labs is straightforward: Identify, explore, and transfer new technologies that have the potential to substantially improve Oracle's business. Oracle's commitment to R&D is a driving factor in the development of technologies that have kept Oracle at the forefront of the computer industry. Although many of Oracle's leading-edge technologies originate in its product development organizations, Oracle Labs is the sole organization at Oracle that is devoted exclusively to research. The acquisition of Sun Microsystems, along with dozens of other acquired companies, brought a wide array of technologies to Oracle's portfolio. Oracle executives recognized that in Sun Microsystems Laboratories, Sun brought the combined company the benefits of an independent research organization - now renamed Oracle Labs.
TALEO QUALIFICATION EXT 2	

Vacancy ID: 2769626

Field	Text
TALEO QUALIFICATION INT 1	Oracle Labs is looking for a candidate with background in embedded software development. Experience of Linux internals, device drivers, and system management at a server level is ideal. Development and debug of silicon, bring-up boards and software in a laboratory setting should be familiar. The candidate must be proficient with C, C++ and assembly. Additionally, the candidate must show proficiency in developing and debugging low-level software that includes boot code, device drivers and diagnostics. The desired candidate would have direct experience with as many of the following as possible: Preferred Skills: - Experience with service processors or embedded firmware on Linux (porting, drivers, root filesystems, etc) - Experience with ILOM or BMC management - New SoC and Board Bringup Experience. Implementation of debug and device drivers is a must. - Bus protocols: I2C/SPI/Ethernet/PCIE understanding - Very strong C development / Linux Environment - Experience with Subversion, Git, and other software versioning tools - Knowledge of languages relevant to the development process, including Perl and/or Python and Unix scripting. Finally, a successful candidate must be a versatile and skilled software developer and be able to debug at various levels of engagement in the bringup, development, and deployment of an SOC. Oracle Labs is the only dedicated research organization within Oracle and reports directly to the Chief Corporate Architect. Oracle Labs mission is straightforward: Identify, explore, and transfer new technologies that have the potential to substantially improve Oracle's business. Oracle's commitment to R&D is a driving factor in the development of technologies that have kept Oracle at the forefront of the computer industry. The Mission of Oracle Labs is straightforward: Identify, explore, and transfer new technologies that have the potential to substantially improve Oracle's business. Oracle's commitment to R&D is a driving factor in the development of technologies that have kept Oracle at the forefront of the computer industry. Although many of Oracle's leading-edge technologies originate in its product development organizations, Oracle Labs is the sole organization at Oracle that is devoted exclusively to research. The acquisition of Sun Microsystems, along with dozens of other acquired companies, brought a wide array of technologies to Oracle's portfolio. Oracle executives recognized that in Sun Microsystems Laboratories, Sun brought the combined company the benefits of an independent research organization - now renamed Oracle Labs.
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	27DEC14:03:00:00
TALEO INTERNAL CLOSE DATE	27JUN15:02:59:00

Vacancy ID: 2769626

Field	Text
TALEO EXTERNAL OPEN DATE	27DEC14:03:00:00
TALEO EXTERNAL CLOSE DATE	28DEC15:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2783536

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2783536
DATE FROM	01/30/2015
VACANCY NAME	IRC2783536
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	150004DM
MANAGER ID	888622867
MANAGER	Mackenthun, Tok Hui
ORGANIZATION NAME	Oracle US
DEPARTMENT DESCRIPTION	Document - Cloud
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	01/30/2015
INTERNAL POSTING END DATE	07/30/2015
EXTERNAL POSTING START DATE	04/06/2015
EXTERNAL POSTING END DATE	07/30/2015

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2783536

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	Oracle Documents Cloud Service provides secure document sharing across devices and outside the organization. Our server team is seeking engineers to build a simple and highly scalable big data analytics platforms to enable tracking, measuring, reporting, and other custom analytic workflows and tools that others can use. RESPONSIBILITIES: • Build solutions that enable sophisticated automation and workflows • Implement cutting edge models and algorithms that operate on massive amounts of data • Develop high performance and scalable solutions that extract, transform, and load big data • Build analytics solution to track user actions • Design and implement data instrumentation, collection & storage processes QUALIFICATIONS: • BS/MS/PhD in Computer Science or related fields • Demonstrated expertise in building analytics solutions (instrumentation, data collection, data analysis) • Strong knowledge of algorithms, data structures and object oriented programming • Experience with Java, Database design, In-Memory Caching, NoSQL, Hadoop, Hive, or other MapReduce solutions • Knowledge of an analytics platform, statistics, machine learning is a plus • 5+ years of professional software engineering experience
TALEO QUALIFICATION EXT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2783536

Field	Text
TALEO QUALIFICATION INT 1	Oracle Documents Cloud Service provides secure document sharing across devices and outside the organization. Our server team is seeking engineers to build a simple and highly scalable big data analytics platforms to enable tracking, measuring, reporting, and other custom analytic workflows and tools that others can use. RESPONSIBILITIES: • Build solutions that enable sophisticated automation and workflows • Implement cutting edge models and algorithms that operate on massive amounts of data • Develop high performance and scalable solutions that extract, transform, and load big data • Build analytics solution to track user actions • Design and implement data instrumentation, collection & storage processes QUALIFICATIONS: • BS/MS/PhD in Computer Science or related fields • Demonstrated expertise in building analytics solutions (instrumentation, data collection, data analysis) • Strong knowledge of algorithms, data structures and object oriented programming • Experience with Java, Database design, In-Memory Caching, NoSQL, Hadoop, Hive, or other MapReduce solutions • Knowledge of an analytics platform, statistics, machine learning is a plus • 5+ years of professional software engineering experience
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	30JAN15:03:00:00
TALEO INTERNAL CLOSE DATE	30JUL15:02:59:00
TALEO EXTERNAL OPEN DATE	30JAN15:03:00:00
TALEO EXTERNAL CLOSE DATE	03APR15:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2811570

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2811570
DATE FROM	03/16/2015
VACANCY NAME	IRC2811570
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	15000CZG
MANAGER ID	888377739
MANAGER	Gilbode, Mr Michael (Mike)
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Oracle Public Cloud
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	03/16/2015
INTERNAL POSTING END DATE	09/16/2015
EXTERNAL POSTING START DATE	03/16/2015
EXTERNAL POSTING END DATE	09/16/2015

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2811570

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	The team's mission is to Enable the development of applications taking advantage of our SaaS, PaaS and IaaS. To achieve this the team will provide developers with a unified SDK which will allow them to take advantage of the numerous SaaS, PaaS and IaaS services in our public cloud. The first step toward delivering this Cloud SDK will be to build a service catalog that can host the definition of these APIs. The team is small, in its early stages and the project is brand new. We need bright, creative, self sufficient developers, with flexibility and a good sense of initiatives, and skills in the following areas: - UI development in JavaScript - Security (Oracle Public Cloud, Oauth) - API management (RAML, Swagger 1.0 and 2.0) - Rest services - Java - Cloud development and architecture having worked with Amazon AWS, Azul or Google compute
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	As part of the Oracle Public Cloud organization you will be working on the infrastructure of the cloud. 1. In a first phase (4 months) the goal is to build a catalog of the Restful Cloud APIs accessible to a given tenant. 2. In a second phase the goal will be to coalesce all the existing APIs (IaaS, PaaS, SaaS) into a coherent set of APIs which will be the foundation of an OPC Cloud SDK. The preferred set of skills will be: - UI development (in JavaScript) - Security - API management - Rest services - Java - Cloud development (Amazon, Azul and Google App and Compute Engine)
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	16MAR15:04:00:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2811570

Field	Text
TALEO INTERNAL CLOSE DATE	16SEP15:02:59:00
TALEO EXTERNAL OPEN DATE	16MAR15:04:00:00
TALEO EXTERNAL CLOSE DATE	22AUG15:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2919677

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2919677
DATE FROM	09/22/2015
VACANCY NAME	IRC2919677
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	15001AKB
MANAGER ID	167785
MANAGER	Kamath, Mr Mohan U
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Oracle Internet of Things
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	09/22/2015

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2919677

Field	Text
INTERNAL POSTING END DATE	03/22/2016
EXTERNAL POSTING START DATE	09/22/2015
EXTERNAL POSTING END DATE	03/22/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
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TALEO DESCRIPTION INT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2919677

Field	Text
TALEO QUALIFICATION EXT 1	Principal Member Technical Staff - IOT Analytics Group Description Our group is engineering big data analytics using leading technologies such as Hadoop, Spark, Kafka etc. in a fast-growing segment known as Industrial Internet of Things (IoT) — allowing customers in manufacturing, transportation, asset management, etc. to improve productivity and safety. The opportunity is compelling for Big Data and IoT enthusiasts — Oracle's portfolio of products sits on rich data sets and use cases. As a pioneer in developing information management capabilities for the enterprise, Oracle provides developers an opportunity to develop use cases that will be used in production, at scale, in missions where robustness and reliability matter. In addition, Oracle's technical contributions in this area are highly visible, watched as being trend-setting in the IoT and big data community. Our team comprises of distinguished subject-matter experts in Hadoop, database systems, IoT and real-time distributed systems, giving you a chance to work and learn from among the best. Responsibilities Design, configure, and implement our data systems and stream processing pipelines Work with operations to build and configure maintainable, resource-efficient systems Develop data pipelines using Kafka, Cassandra, Spark Leverage Event processing technologies to deliver real time analytics features Develop a cloud service that would be processing billions of events a day Leverage fast data pipelines for real time analytics on various Oracle SaaS applications Contribute ideas for continually improving the team's productivity, job enjoyment, and code quality. Actively mentor junior developers to develop their technical expertise Have fun engineering software and scalable systems Desired Skills and Experience Production experience with Cassandra, HBase, Spark, MapReduce or similar data stores 5+ years experience with enterprise software and/or PaaS infrastructure Good programming skills in Java or Scala Organized, good attention to details, able to work both independently and with a team Experience in cloud deployments and performance tuning of distributed systems Excellent problem solver, analytic thinker, and quick learner BS or MS in Computer Science or related technical field
TALEO QUALIFICATION EXT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2919677

Field	Text
TALEO QUALIFICATION INT 1	Principal Member Technical Staff - IOT Analytics Group Description Our group is engineering big data analytics using leading technologies such as Hadoop, Spark, Kafka etc. in a fast-growing segment known as Industrial Internet of Things (IoT) — allowing customers in manufacturing, transportation, asset management, etc. to improve productivity and safety. The opportunity is compelling for Big Data and IoT enthusiasts — Oracle's portfolio of products sits on rich data sets and use cases. As a pioneer in developing information management capabilities for the enterprise, Oracle provides developers an opportunity to develop use cases that will be used in production, at scale, in missions where robustness and reliability matter. In addition, Oracle's technical contributions in this area are highly visible, watched as being trend-setting in the IoT and big data community. Our team comprises of distinguished subject-matter experts in Hadoop, database systems, IoT and real-time distributed systems, giving you a chance to work and learn from among the best. Responsibilities Design, configure, and implement our data systems and stream processing pipelines Work with operations to build and configure maintainable, resource-efficient systems Develop data pipelines using Kafka, Cassandra, Spark Leverage Event processing technologies to deliver real time analytics features Develop a cloud service that would be processing billions of events a day Leverage fast data pipelines for real time analytics on various Oracle SaaS applications Contribute ideas for continually improving the team's productivity, job enjoyment, and code quality. Actively mentor junior developers to develop their technical expertise Have fun engineering software and scalable systems Desired Skills and Experience Production experience with Cassandra, HBase, Spark, MapReduce or similar data stores 5+ years experience with enterprise software and/or PaaS infrastructure Good programming skills in Java or Scala Organized, good attention to details, able to work both independently and with a team Experience in cloud deployments and performance tuning of distributed systems Excellent problem solver, analytic thinker, and quick learner BS or MS in Computer Science or related technical field
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	22SEP15:03:00:00
TALEO INTERNAL CLOSE DATE	22MAR16:02:59:00
TALEO EXTERNAL OPEN DATE	22SEP15:03:00:00
TALEO EXTERNAL CLOSE DATE	23DEC15:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2969913

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	2969913
DATE FROM	01/06/2015
VACANCY NAME	IRC2969913
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	1500009Z
MANAGER ID	200651
MANAGER	Arora, Ms Geeta
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	XML and JSON database team
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. <p style="margin-top:0px;margin-bottom:0px"> Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law. <p style="margin-top:0px;margin-bottom:0px"> <p style="margin-top:0px;margin-bottom:0px">
DETAILED DESCRIPTION	
JOB REQUIREMENTS	

Vacancy ID: 2969913

Field	Text
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	01/06/2015
INTERNAL POSTING END DATE	06/15/2016
EXTERNAL POSTING START DATE	01/06/2015
EXTERNAL POSTING END DATE	06/15/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 2969913

Field	Text
TALEO QUALIFICATION EXT 1	Are you someone who has the knowledge, passion and vision to push the boundaries of large database technology? Do you want to be a part of an elite research and development team at Oracle that is responsible for ushering in cutting edge approaches to big data management, search and information retrieval? Every day at Oracle we are changing the way the world and Enterprises do business by challenging the status quo through the delivery of innovative cloud, infrastructure and data systems solutions. The things we do at Oracle have never been done before and our technology has tremendous impact on millions of people across the globe. At Oracle we believe that all known technical limitations of software architecture need to be addressed, only then can computing technology help businesses realize and capitalize on new opportunities as well as innovate faster. Oracle's Semistructured Database Team is a highly respected and highly sought after team within Oracle b/c our contributions provide the building blocks for storing semi-structured data in Oracle's Database technology. We are an energetic team with a passion for pushing the limits of traditional databases while building a highly scalable platform for efficient processing of semistructured data models (like JSON, XML and other Big Data representations). Our approach to developing native storage, indexing and querying for XML and JSON content for efficient retrieval, has resulted in industry leading performance. The growth in the use of this data has created a need to manage semi-structured data with the same degree of rigor as is needed for other mission-critical data. Semistructured Big data is increasingly pervasive in critical industries, including healthcare and finance. Our team is defining the industry standards for semistructured data and is delivering technology that will keep Oracle ahead of our competitors. We are an elite engineering team looking to add a Principal Engineer with a strong systems background who also shares a passion for solving complex problems in large systems. As a lead contributor to our team, you will be responsible for designing efficient algorithms for storage and retrieval of semistructured data, and making sure it works in a scalable, high performing manner with Oracle database infrastructure. We seek individuals with a strong background in systems level programming, including knowledge of compilers and database internals like query and index processing. Prior knowledge of JSON / XML / XQuery is preferable but not required. For more information, visit http://www.oracle.com/technetwork/database/features/xmldb/index.html
TALEO QUALIFICATION EXT 2	

Vacancy ID: 2969913

Field	Text
TALEO QUALIFICATION INT 1	Oracle Semistructured Database Team (XML DB / JSON DB) Come join an energetic team with a passion to push the limits of traditional databases to build a highly scalable platform for efficient processing of semistructured data models, like JSON, XML and other Big Data representations. We are looking for candidates with strong systems background, with a passion for solving complex problems in large systems. We store XML & JSON natively in the Oracle database. In particular, we develop native storage, indexing and querying for XML and JSON content for efficient retrieval. The growth in the use of this data has created a need to manage it with the same degree of rigor as is needed for other mission-critical data. Semistructured Big data is increasingly pervasive in critical industries, including healthcare and finance. We work hard on cutting edge technology, to help define the semistructured standards and stay ahead of our competitors. As a member of our team, you will be responsible for designing efficient algorithms for storage and retrieval of semistructured data, and making sure it works in a scalable, performant manner with Oracle database infrastructure. We seek individuals with a strong background in systems level programming, including knowledge of compilers and database internals like query and index processing. Prior knowledge of JSON / XML / XQuery is preferable but not required. For more information, visit http://www.oracle.com/technetwork/database/features/xmldb/index.html
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	06JAN15:03:00:00
TALEO INTERNAL CLOSE DATE	06JUL15:02:59:00
TALEO EXTERNAL OPEN DATE	06JAN15:03:00:00
TALEO EXTERNAL CLOSE DATE	07JAN16:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3055861

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3055861
DATE FROM	12/24/2015
VACANCY NAME	IRC3055861
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	15001NBZ
MANAGER ID	887232786
MANAGER	Shishir, Mr Prashant Kumar (Prashant)
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Oracle Public Cloud
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	12/24/2015

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3055861

Field	Text
INTERNAL POSTING END DATE	06/24/2016
EXTERNAL POSTING START DATE	12/24/2015
EXTERNAL POSTING END DATE	06/24/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Vacancy ID: 3055861

Field	Text
TALEO QUALIFICATION EXT 1	Oracle PaaS offerings include providing the world's best platforms - Oracle Database and Oracle Fusion Middleware, on the Cloud. More information about our organization, Oracle Cloud can be found here: https://cloud.oracle.com/ We are looking for talented individuals who are passionate about developing cutting edge enterprise systems using Java. As a member of the software engineering team, you will participate in the entire software development process: requirements gathering and analysis, working with product management to define product features, designing system architectures, implementing and documenting features, writing/testing/maintaining code, leading cross-team projects, and mentoring other team members. The ideal candidate will demonstrate strong skills in several of the following areas: * Minimum of Bachelor's degree in relevant discipline and 7+ years of experience * Java Concurrency: multi-threading, locking, synchronization free concurrency implementation, Java concurrency patterns, etc. * Java Design and Abstraction: designing classes and interface, using patterns effectively, documenting APIs clearly, planning for extension, design for testability * Java Tuning and Debugging: general Java tuning, multi-threaded performance consideration, sophisticated online debugging, heap dump analysis, J2EE execution environment debugging * Advanced Java Experience: hierarchical classloaders, runtime classloading, reflection APIs, use of generics in API design * Java + Database: core JDBC experience, ORM persistence frameworks, resource pooling and cleanup, datatype conversion * OS Automation and Integration: scripting (sh, perl, python etc.), Linux/Solaris tool familiarity, OS resource management, job management * Networking: transport protocols, security, load balancing, routing, performance * Specific Application Domain Knowledge: e.g. J2EE, Webservices, SOA architecture, Identity Management, High Availability architectures, scalable design and deployment, virtualization,etc. * Ability to work in an extremely fast paced and challenging, global environment
TALEO QUALIFICATION EXT 2	

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3055861

Field	Text
TALEO QUALIFICATION INT 1	Oracle PaaS offerings include providing the world's best platforms - Oracle Database and Oracle Fusion Middleware, on the Cloud. More information about our organization, Oracle Cloud can be found here: https://cloud.oracle.com/ We are looking for talented individuals who are passionate about developing cutting edge enterprise systems using Java. As a member of the software engineering team, you will participate in the entire software development process: requirements gathering and analysis, working with product management to define product features, designing system architectures, implementing and documenting features, writing/testing/maintaining code, leading cross-team projects, and mentoring other team members. The ideal candidate will demonstrate strong skills in several of the following areas: * Minimum of Bachelor's degree in relevant discipline and 7+ years of experience * Java Concurrency: multi-threading, locking, synchronization free concurrency implementation, Java concurrency patterns, etc. * Java Design and Abstraction: designing classes and interface, using patterns effectively, documenting APIs clearly, planning for extension, design for testability * Java Tuning and Debugging: general Java tuning, multi-threaded performance consideration, sophisticated online debugging, heap dump analysis, J2EE execution environment debugging * Advanced Java Experience: hierarchical classloaders, runtime classloading, reflection APIs, use of generics in API design * Java + Database: core JDBC experience, ORM persistence frameworks, resource pooling and cleanup, datatype conversion * OS Automation and Integration: scripting (sh, perl, python etc.), Linux/Solaris tool familiarity, OS resource management, job management * Networking: transport protocols, security, load balancing, routing, performance * Specific Application Domain Knowledge: e.g. J2EE, Webservices, SOA architecture, Identity Management, High Availability architectures, scalable design and deployment, virtualization,etc. * Ability to work in an extremely fast paced and challenging, global environment
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	24DEC15:03:00:00
TALEO INTERNAL CLOSE DATE	24JUN16:02:59:00
TALEO EXTERNAL OPEN DATE	24DEC15:03:00:00
TALEO EXTERNAL CLOSE DATE	04DEC16:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3058147

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3058147
DATE FROM	01/23/2016
VACANCY NAME	IRC3058147
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	160002E8
MANAGER ID	893076055
MANAGER	Bhattacharyya, Mr Debraj (Debraj)
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Fusion Release Engineering
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	01/23/2016

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3058147

Field	Text
INTERNAL POSTING END DATE	07/23/2016
EXTERNAL POSTING START DATE	02/04/2016
EXTERNAL POSTING END DATE	07/23/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Vacancy ID: 3058147

Field	Text
TALEO QUALIFICATION EXT 1	SUMMARY: Our dynamic team, Fusion Release Engineering (FRE), is responsible for all aspects of Build and Integration for Fusion Applications, Oracle's next generation Business Applications. The team is also involved with life cycle (build to deploy) as well as code line management. This is an exciting opportunity to apply and develop analytical and technical skills in the fast growing and dynamic field of Build & Release Engineering. This role primarily requires systems operational expertise along with administration and configuration of various tools and frameworks for Build and Release Engineering. To manage the delivery of software systems based on a variety of technology components in a manner which provides the maximum reliability and lowest amount of downtime to our customers. RESPONSIBILITIES: Operations support and maintenance of the build and patch generation system, tools and frameworks for audit, testing and reporting for Java, C-code and Database build. Working closely with Development, Quality Assurance, Operations, Middleware and Product Development teams in order to improve product development standards and processes with administration and configuration of various tools and frameworks for Build and Release Engineering. Designing and developing validation, reporting and build automation utilities. Involvement in product design and development to continually enhance the installation and upgrade of our applications. REQUIRED QUALIFICATIONS: 6+ years' experience in Enterprise Software Development 6+ years' experience with Java|J2EE Technology Stack including Java pattern programming. 6+ years' working with Unix Operating Systems. 6+ years' using Build Tools including Ant, Gradle, and/or Maven. 6+ years' Apache web-servers, Weblogic server including application configuration and administration. 3+ years' experience with Cloud deployments and SaaS models. PREFERRED QUALIFICATIONS Previous technical support, system support or system administration experience. Familiarity with Oracle ADF and SOA framework experience. Must be independent, self-motivated and a team player. Excellent problem solving and debugging skills. Ability to communicate with people of different cultural and language background. Must work well under pressure on multiple projects. The team is also involved with life cycle (build to deploy) as well as code line management. The work is highly technical and includes all aspects of software development from architecture, design to implementation. FRE team members work closely with Fusion Development and Fusion Middleware teams, as well as numerous other teams across Oracle to ensure the highest possible quality of delivered code through the specification and implementation of standards and processes. The team provides training, education and support to the development community on the build infrastructure.

Vacancy ID: 3058147

Field	Text
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	Our dynamic team, Fusion Release Engineering (FRE), is responsible for all aspects of Build and Integration for Fusion Applications, Oracle's next generation Business Applications. Responsibilities include operations support and maintenance of the build and patch generation system, tools and frameworks for audit, testing and reporting for Java, C-code and Database build. The team is also involved with life cycle (build to deploy) as well as code line management. The work is highly technical and includes all aspects of software development from architecture, design to implementation. FRE team members work closely with Fusion Development and Fusion Middleware teams, as well as numerous other teams across Oracle to ensure the highest possible quality of delivered code through the specification and implementation of standards and processes. The team provides training, education and support to the development community on the build infrastructure. This is an exciting opportunity to apply and develop analytical and technical skills in the fast growing and dynamic field of Build & Release Engineering. This role primarily requires systems operational expertise along with administration and configuration of various tools and frameworks for Build and Release Engineering. To manage the delivery of software systems based on a variety of technology components in a manner which provides the maximum reliability and lowest amount of downtime to our customers, your responsibilities will include: 1) Working closely with Development, Quality Assurance, Operations, middle-ware and Product Development teams in order to improve product development standards and processes. 2) Designing and developing validation, reporting and build automation utilities 3) Involvement in product design and development to continually enhance the installation and upgrade of our applications Technical Skills 1. Excellent problem solving and debugging skills 2. Strong Unix operating system skills. Previous technical support, system support or system administration experience is a plus 3. Experience with Ant/Gradle 4. Experience Apache web-servers, Weblogic server including application configuration and administration 5. Familiarity with Cloud deployments and SaaS models 6. Programming experience in Java/ J2EE Technology Stack 7. Java pattern programming is highly desirable 8. Familiarlity with Oracle ADF and SOA framework experience is desirable. Soft Skills 1. Must be independent, self-motivated and a team player 2. Ability to communicate with people of different cultural and language background 3. Must work well under pressure on multiple projects.
TALEO QUALIFICATION INT 2	

Vacancy ID: 3058147

Field	Text
TALEO INTERNAL OPEN DATE	23JAN16:03:00:00
TALEO INTERNAL CLOSE DATE	23JUL16:02:59:00
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3101600

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3101600
DATE FROM	02/26/2016
VACANCY NAME	IRC3101600
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	160007GL
MANAGER ID	93148
MANAGER	Kee, Ms Helena P Y
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Test Development
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will assist in defining and developing software for tasks associated with the developing, debugging or designing of software applications or operating systems. Provide technical leadership to other software developers. Specify, design and implement modest changes to existing software architecture to meet changing needs. Duties and tasks are varied and complex needing independent judgment. Fully competent in own area of expertise. May have project lead role and or supervise lower level personnel. BS or MS degree or equivalent experience relevant to functional area. 4 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	02/26/2016

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3101600

Field	Text
INTERNAL POSTING END DATE	08/26/2016
EXTERNAL POSTING START DATE	02/26/2016
EXTERNAL POSTING END DATE	08/26/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will assist in defining and developing software for tasks associated with the developing, debugging or designing of software applications or operating systems. Provide technical leadership to other software developers. Specify, design and implement modest changes to existing software architecture to meet changing needs. Duties and tasks are varied and complex needing independent judgment. Fully competent in own area of expertise. May have project lead role and or supervise lower level personnel. BS or MS degree or equivalent experience relevant to functional area. 4 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will assist in defining and developing software for tasks associated with the developing, debugging or designing of software applications or operating systems. Provide technical leadership to other software developers. Specify, design and implement modest changes to existing software architecture to meet changing needs. Duties and tasks are varied and complex needing independent judgment. Fully competent in own area of expertise. May have project lead role and or supervise lower level personnel. BS or MS degree or equivalent experience relevant to functional area. 4 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Vacancy ID: 3101600

Field	Text
TALEO QUALIFICATION EXT 1	Database Test Development, Server Technology The Database Test Development Team has an opportunity for a highly motivated self starter who will collaborate and contribute to emerging products in a fast paced environment. Our team prepares automated tests and reviews results when the tests are in place, for a very dynamic, constantly changing product and consequently, test verification is updated as well. The persons in this team are comprised of diverse individuals located in the Americas and Asia, leading to interesting, effective team collaboration. We prefer a person with an advanced degree in Computer Science or related degree with 4 or more years in software or test development in progressively challenging projects, knowledgeable in Linux/UNIX. Database fundamentals and experience is desirable. If you fit these criteria, you have the mix to be very successful with our projects, do drop your resume! Department Description The Database Test Development Group is responsible for Oracle's RDBMS product that includes the recently announced Zero Data Loss Recovery Appliance. We are also responsible for the Oracle Exadata Database Machine that delivers extreme performance and scalability for all database applications, consolidation of mixed database workloads, and many more technical advances. Our test development engineers challenge is to code applications to ensure the high quality of these complex products. This presents an unique opportunity to work with and become an expert on various premium and diverse features such as the Database In Memory Option, Automated Storage Management (ASM), Real Application Clusters (RAC) and RDS/Infiniband technology to name a few, in addition to mastery over the Oracle Database itself. Our group handles automated testing for right from the network layer to storage to imaging/installation/software upgrades right to every single Oracle Database feature. You gain proficiency in scripting (perl/shell), OS knowledge and programming with C/Java and/or PLSQL/SQL and exposure to a wide range of technologies like Security, XML, Real Application Clusters, Data Access, Data Warehousing, Grid Computing, Enterprise Replication, Advanced Queuing, Messaging, Data Storage, Backup and Recovery, High Availability, COM+, .Net, and more. You will be interacting with a highly technical team here in the US, China, Mexico and finally in India where we have significant presence. In this environment, you will be challenged, meet people from various cultures and collaborate and inventive to resolve and implement the many non-routine testing challenges that we face. You will have the opportunity to thrive and grow your skills in database technologies and participate in new functionalities and products. Job Responsibilities We design, develop then debug test cases for new and existing functionality, with a view to product high quality for the Oracle server manageability. Candidate Profile 1. Proficiency in Linux/Unix/Windows OS environments 2. Proficiency

Vacancy ID: 3101600

Field	Text
	in shell scripting, perl desirable 3. Oracle Database knowledge or experience, SQL, PL/SQL highly desirable 4. Advanced CS Degree preferred.
TALEO QUALIFICATION EXT 2	
TALEO QUALIFICATION INT 1	This team prepares automated tests and reviews results when the tests are in place, for a very dynamic, constantly changing product where the functionality is constantly being enhanced, and consequently, test verification is constantly updated as well. The persons in this team are comprised of diverse individuals located in the Americas and Asia, leading to interesting, effective team collaboration. We prefer a person with a BS or MS in Computer Science with a minimum of 4 years of related experience in software development or testing.
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	26FEB16:03:00:00
TALEO INTERNAL CLOSE DATE	26AUG16:02:59:00
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3113591

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3113591
DATE FROM	04/14/2016
VACANCY NAME	IRC3113591
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	16000F3H
MANAGER ID	105317
MANAGER	Hackel, Mr Kurt C
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Private Cloud Appliance
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	04/14/2016
INTERNAL POSTING END DATE	10/14/2016
EXTERNAL POSTING START DATE	04/14/2016
EXTERNAL POSTING END DATE	10/14/2016

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3113591

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	
TALEO QUALIFICATION EXT 1	The Oracle Virtual Compute Appliance product development team is a fast-paced, multi-faceted engineering organization. As part of Oracle's Engineered Systems portfolio, product development merges server, storage, networking, and software for a unified, turnkey solution for customers looking for rapid cloud deployment. Taking advantage of existing Oracle hardware and virtualization software, the team focuses on defining more value and higher quality with additional software features. Experience required - 5+ years hands-on experience developing enterprise software- Skilled in Python, Java or similar languages - Linux networking, SAN/NAS storage configuration, infiniband networking, virtual machine administration highly desirable - Working experience on Linux and/or Solaris - Understanding of Cloud computing, virtualization, and hypervisors - Experience in web services, XML, REST, and SNMP a highly desired plus - OracleDB and SQL knowledge a plus - Additional programming languages such as Perl, Tcl/expect, BASH a plus - Experience with test automation a plus - Demonstrated excellent communication skills - Ability to multi-task - Willingness to experiment and take risks - Willingness to work in a fluid environment - Operational and/or development experience with Openstack highly desireable
TALEO QUALIFICATION EXT 2	

Vacancy ID: 3113591

Field	Text
TALEO QUALIFICATION INT 1	The Oracle Virtual Compute Appliance product development team is a fast-paced, multi-faceted engineering organization. As part of Oracle's Engineered Systems portfolio, product development merges server, storage, networking, and software for a unified, turnkey solution for customers looking for rapid cloud deployment. Taking advantage of existing Oracle hardware and virtualization software, the team focuses on defining more value and higher quality with additional software features. Experience required - 5+ years hands-on experience developing enterprise software- Skilled in Python, Java or similar languages - Linux networking, SAN/NAS storage configuration, infiniband networking, virtual machine administration highly desirable - Working experience on Linux and/or Solaris - Understanding of Cloud computing, virtualization, and hypervisors - Experience in web services, XML, REST, and SNMP a highly desired plus - OracleDB and SQL knowledge a plus - Additional programming languages such as Perl, Tcl/expect, BASH a plus - Experience with test automation a plus - Demonstrated excellent communication skills - Ability to multi-task - Willingness to experiment and take risks - Willingness to work in a fluid environment - Operational and/or development experience with Openstack highly desireable
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	14APR16:03:00:00
TALEO INTERNAL CLOSE DATE	14OCT16:02:59:00
TALEO EXTERNAL OPEN DATE	14APR16:03:00:00
TALEO EXTERNAL CLOSE DATE	01JAN17:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3131826

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3131826
DATE FROM	04/13/2016
VACANCY NAME	IRC3131826
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	16000ER6
MANAGER ID	892416992
MANAGER	Krishnan, Veeraraghavan (Raghavan)
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Cloud Operations
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	04/13/2016

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3131826

Field	Text
INTERNAL POSTING END DATE	10/13/2016
EXTERNAL POSTING START DATE	04/13/2016
EXTERNAL POSTING END DATE	10/13/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Vacancy ID: 3131826

Field	Text
TALEO QUALIFICATION EXT 1	Oracle Public Cloud is experiencing significant growth resulting in rapid expansion of the underlying network infrastructure to support that growth. We are looking for software engineers with development experience in multiple areas including virtualized networks, network /infrastructure automation, SDN controllers and associated tools and technologies. As part of a global team of network architects, engineers and software developers, you will have the opportunity to create and deliver fully automated datacenter and backbone networks to support cloud scale applications . You will be building software for controlling distributed network services, multi-level abstractions,complete automation of configurations, deployment and management of our cloud network infrastructure extending from the core datacenter to global backbone networks. In collaboration with the network architects, you will design and implement the network models to support the rapid growth, monitoring, capacity planning and provide well designed templates and tools to deliver network services as code. You will create standards and repeatable templates for device level configuration and expose them as reusable services by higher layers of orchestration. The job additionally involves converting traditional modes of CLI based network configuration into automated services driven by software. There are no dearth of challenges and opportunities are plentiful to apply your software engineering knowledge in creating the next generation of software defined networks. Qualifications: - B.S. in Computer Science, Electrical Engineering or equivalent experience. - Strong software engineering/development background with at least 5+ years experience in large distributed systems, infrastructure or network automation and Web services - Proficiency at programming in Python, Java. - Well versed in developments in Software Defined Networking and controllers like OpenDaylight, openvSwitch - Strong knowledge of API design such as Netconf, RESTful API as well as configuration management tools such as CHEF, Ansible - Good knowledge of data models, relational databases, NOSQL and a generl understanding of cloud development principals such as loose coupling, separation of services, micro services - Must have familiarity with load balancing platforms and technologies, firewall platforms, switching and routing platforms - Cisco, Juniper, F5 and other open source alternatives - Knowledge of IP Networking, datacenter network technologies, packet forwarding architectures and internet routing protocols (BGP, GRE, IPSec, VxLAN, Dot1Q, QinQ, 40G/100G futures, DNS, HTTP, netflow/Jflow etc) highly desirable. - Good understanding of software development tools such as SCMs, automated build systems, test systems and harnesses, Continuous Integration/ Delivery/Deployment. - Must have strong debugging skills. - Experience and desire to

Vacancy ID: 3131826

Field	Text
	write clean, testable code with automated tests - Strong focus on complete automation and delivering highly available solutions for highly demanding requirements (devops). - CCIE / JNCIE certifications or equivalents are an added advantage - willingness to adopt and adapt to new technologies. - Ability to accomplish goals independently - highly result oriented. - A strong team player with excellent written and verbal communication skills.
TALEO QUALIFICATION EXT 2	

Vacancy ID: 3131826

Field	Text
TALEO QUALIFICATION INT 1	Oracle Public Cloud is experiencing significant growth resulting in rapid expansion of the underlying network infrastructure to support that growth. We are looking for software engineers with development experience in multiple areas including virtualized networks, network /infrastructure automation, SDN controllers and associated tools and technologies. As part of a global team of network architects, engineers and software developers, you will have the opportunity to create and deliver fully automated datacenter and backbone networks to support cloud scale applications . You will be building software for controlling distributed network services, multi-level abstractions,complete automation of configurations, deployment and management of our cloud network infrastructure extending from the core datacenter to global backbone networks. In collaboration with the network architects, you will design and implement the network models to support the rapid growth, monitoring, capacity planning and provide well designed templates and tools to deliver network services as code. You will create standards and repeatable templates for device level configuration and expose them as reusable services by higher layers of orchestration. The job additionally involves converting traditional modes of CLI based network configuration into automated services driven by software. There are no dearth of challenges and opportunities are plentiful to apply your software engineering knowledge in creating the next generation of software defined networks. Qualifications: - B.S. in Computer Science, Electrical Engineering or equivalent experience. - Strong software engineering/development background with at least 5+ years experience in large distributed systems, infrastructure or network automation and Web services - Proficiency at programming in Python, Java. - Well versed in developments in Software Defined Networking and controllers like OpenDaylight, openvSwitch - Strong knowledge of API design such as Netconf, RESTful API as well as configuration management tools such as CHEF, Ansible - Good knowledge of data models, relational databases, NOSQL and a generl understanding of cloud development principals such as loose coupling, separation of services, micro services - Must have familiarity with load balancing platforms and technologies, firewall platforms, switching and routing platforms - Cisco, Juniper, F5 and other open source alternatives - Knowledge of IP Networking, datacenter network technologies, packet forwarding architectures and internet routing protocols (BGP, GRE, IPSec, VxLAN, Dot1Q, QinQ, 40G/100G futures, DNS, HTTP, netflow/Jflow etc) highly desirable. - Good understanding of software development tools such as SCMs, automated build systems, test systems and harnesses, Continuous Integration/ Delivery/Deployment. - Must have strong debugging skills. - Experience and desire to

Vacancy ID: 3131826

Field	Text
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TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	13APR16:03:00:00
TALEO INTERNAL CLOSE DATE	13OCT16:02:59:00
TALEO EXTERNAL OPEN DATE	13APR16:03:00:00
TALEO EXTERNAL CLOSE DATE	03OCT16:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3133629

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3133629
DATE FROM	04/13/2016
VACANCY NAME	IRC3133629
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	16000ER5
MANAGER ID	892416992
MANAGER	Krishnan, Veeraraghavan (Raghavan)
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Cloud Operations
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	04/13/2016

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3133629

Field	Text
INTERNAL POSTING END DATE	10/13/2016
EXTERNAL POSTING START DATE	04/13/2016
EXTERNAL POSTING END DATE	10/13/2016
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION EXT 2	
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 2	

Vacancy ID: 3133629

Field	Text
TALEO QUALIFICATION EXT 1	Oracle Public Cloud is experiencing significant growth resulting in rapid expansion of the underlying network infrastructure to support that growth. We are looking for software engineers with development experience in multiple areas including virtualized networks, network /infrastructure automation, SDN controllers and associated tools and technologies. As part of a global team of network architects, engineers and software developers, you will have the opportunity to create and deliver fully automated datacenter and backbone networks to support cloud scale applications . You will be building software for controlling distributed network services, multi-level abstractions,complete automation of configurations, deployment and management of our cloud network infrastructure extending from the core datacenter to global backbone networks. In collaboration with the network architects, you will design and implement the network models to support the rapid growth, monitoring, capacity planning and provide well designed templates and tools to deliver network services as code. You will create standards and repeatable templates for device level configuration and expose them as reusable services by higher layers of orchestration. The job additionally involves converting traditional modes of CLI based network configuration into automated services driven by software. There are no dearth of challenges and opportunities are plentiful to apply your software engineering knowledge in creating the next generation of software defined networks. Qualifications: - B.S. in Computer Science, Electrical Engineering or equivalent experience. - Strong software engineering/development background with at least 5+ years experience in large distributed systems, infrastructure or network automation and Web services - Proficiency at programming in Python, Java. - Well versed in developments in Software Defined Networking and controllers like OpenDaylight, openvSwitch - Strong knowledge of API design such as Netconf, RESTful API as well as configuration management tools such as CHEF, Ansible - Good knowledge of data models, relational databases, NOSQL and a generl understanding of cloud development principals such as loose coupling, separation of services, micro services - Must have familiarity with load balancing platforms and technologies, firewall platforms, switching and routing platforms - Cisco, Juniper, F5 and other open source alternatives - Knowledge of IP Networking, datacenter network technologies, packet forwarding architectures and internet routing protocols (BGP, GRE, IPSec, VxLAN, Dot1Q, QinQ, 40G/100G futures, DNS, HTTP, netflow/Jflow etc) highly desirable. - Good understanding of software development tools such as SCMs, automated build systems, test systems and harnesses, Continuous Integration/ Delivery/Deployment. - Must have strong debugging skills. - Experience and desire to

Vacancy ID: 3133629

Field	Text
	write clean, testable code with automated tests - Strong focus on complete automation and delivering highly available solutions for highly demanding requirements (devops). - CCIE / JNCIE certifications or equivalents are an added advantage - willingness to adopt and adapt to new technologies. - Ability to accomplish goals independently - highly result oriented. - A strong team player with excellent written and verbal communication skills.
TALEO QUALIFICATION EXT 2	

Vacancy ID: 3133629

Field	Text
TALEO QUALIFICATION INT 1	Oracle Public Cloud is experiencing significant growth resulting in rapid expansion of the underlying network infrastructure to support that growth. We are looking for software engineers with development experience in multiple areas including virtualized networks, network /infrastructure automation, SDN controllers and associated tools and technologies. As part of a global team of network architects, engineers and software developers, you will have the opportunity to create and deliver fully automated datacenter and backbone networks to support cloud scale applications . You will be building software for controlling distributed network services, multi-level abstractions,complete automation of configurations, deployment and management of our cloud network infrastructure extending from the core datacenter to global backbone networks. In collaboration with the network architects, you will design and implement the network models to support the rapid growth, monitoring, capacity planning and provide well designed templates and tools to deliver network services as code. You will create standards and repeatable templates for device level configuration and expose them as reusable services by higher layers of orchestration. The job additionally involves converting traditional modes of CLI based network configuration into automated services driven by software. There are no dearth of challenges and opportunities are plentiful to apply your software engineering knowledge in creating the next generation of software defined networks. Qualifications: - B.S. in Computer Science, Electrical Engineering or equivalent experience. - Strong software engineering/development background with at least 5+ years experience in large distributed systems, infrastructure or network automation and Web services - Proficiency at programming in Python, Java. - Well versed in developments in Software Defined Networking and controllers like OpenDaylight, openvSwitch - Strong knowledge of API design such as Netconf, RESTful API as well as configuration management tools such as CHEF, Ansible - Good knowledge of data models, relational databases, NOSQL and a generl understanding of cloud development principals such as loose coupling, separation of services, micro services - Must have familiarity with load balancing platforms and technologies, firewall platforms, switching and routing platforms - Cisco, Juniper, F5 and other open source alternatives - Knowledge of IP Networking, datacenter network technologies, packet forwarding architectures and internet routing protocols (BGP, GRE, IPSec, VxLAN, Dot1Q, QinQ, 40G/100G futures, DNS, HTTP, netflow/Jflow etc) highly desirable. - Good understanding of software development tools such as SCMs, automated build systems, test systems and harnesses, Continuous Integration/ Delivery/Deployment. - Must have strong debugging skills. - Experience and desire to

Vacancy ID: 3133629

Field	Text
	write clean, testable code with automated tests - Strong focus on complete automation and delivering highly available solutions for highly demanding requirements (devops). - CCIE / JNCIE certifications or equivalents are an added advantage - willingness to adopt and adapt to new technologies. - Ability to accomplish goals independently - highly result oriented. - A strong team player with excellent written and verbal communication skills.
TALEO QUALIFICATION INT 2	
TALEO INTERNAL OPEN DATE	13APR16:03:00:00
TALEO INTERNAL CLOSE DATE	13OCT16:02:59:00
TALEO EXTERNAL OPEN DATE	13APR16:03:00:00
TALEO EXTERNAL CLOSE DATE	03AUG16:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3151622

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3151622
DATE FROM	04/05/2016
VACANCY NAME	IRC3151622
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	16000DIK
MANAGER ID	235243
MANAGER	Liang, Mr Chao (Chao)
ORGANIZATION NAME	Oracle
DEPARTMENT DESCRIPTION	Database Security
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	04/05/2016
INTERNAL POSTING END DATE	04/30/2017
EXTERNAL POSTING START DATE	04/11/2016
EXTERNAL POSTING END DATE	04/30/2017

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3151622

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION EXT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION INT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO QUALIFICATION EXT 1	We are looking for a talented UI Designer to create amazing user experiences for Oracle Cloud Services for data security. he ideal candidate should have an eye for clean and artful design, possess superior UI development skills and be able to translate high-level requirements into interaction flows and artifacts, and transform them into beautiful, intuitive, and functional user interfaces. Responsibilities - Collaborate with product management and development to define and implement innovative solutions for the product direction, visuals and experience - Execute all visual design stages from concept to final hand-off to engineering - Conceptualize original ideas that bring simplicity and user friendliness to complex design roadblocks - Create wire-frames, storyboards, user flows, process flows to effectively communicate interaction and design ideas - Implement application front-end interface and integrate with back-end functionality - Establish and promote design guidelin
TALEO QUALIFICATION EXT 2	es, best practices and standards Requirements:- Proven UI experience and demonstrable UI design skills - Solid experience in creating wire-frames, storyboards, user flows, process flows - Proficiency in visual design and wire-framing tools - Proficiency in HTML5, CSS, and JavaScript and Java - Excellent visual design skills with sensitivity to user-system interaction - Proficiency in J2EE application development - Proven ability to build UI components for complex software products - Ability to solve problems creatively and effectively - Up-to-date with the latest UI trends, techniques, and technologies - BS/MS in computer science and engineering, human-computer interaction or related

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3151622

Field	Text
TALEO QUALIFICATION INT 1	We are looking for a talented UI Designer to create amazing user experiences for Oracle Cloud Services for data security. he ideal candidate should have an eye for clean and artful design, possess superior UI development skills and be able to translate high-level requirements into interaction flows and artifacts, and transform them into beautiful, intuitive, and functional user interfaces. Responsibilities - Collaborate with product management and development to define and implement innovative solutions for the product direction, visuals and experience - Execute all visual design stages from concept to final hand-off to engineering - Conceptualize original ideas that bring simplicity and user friendliness to complex design roadblocks - Create wire-frames, storyboards, user flows, process flows to effectively communicate interaction and design ideas - Implement application front-end interface and integrate with back-end functionality - Establish and promote design guidelin
TALEO QUALIFICATION INT 2	es, best practices and standards Requirements:- Proven UI experience and demonstrable UI design skills - Solid experience in creating wire-frames, storyboards, user flows, process flows - Proficiency in visual design and wire-framing tools - Proficiency in HTML5, CSS, and JavaScript and Java - Excellent visual design skills with sensitivity to user-system interaction - Proficiency in J2EE application development - Proven ability to build UI components for complex software products - Ability to solve problems creatively and effectively - Up-to-date with the latest UI trends, techniques, and technologies - BS/MS in computer science and engineering, human-computer interaction or related
TALEO INTERNAL OPEN DATE	06APR16:03:00:00
TALEO INTERNAL CLOSE DATE	06OCT16:02:59:00
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3645535

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3645535
DATE FROM	12/21/2017
VACANCY NAME	IRC3645535
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	Replacement
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	17001GVI
MANAGER ID	892318712
MANAGER	Mayala, Tulsi Ram
ORGANIZATION NAME	Oracle
DEPARTMENT DESCRIPTION	
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	12/21/2017
INTERNAL POSTING END DATE	06/21/2018
EXTERNAL POSTING START DATE	12/21/2017
EXTERNAL POSTING END DATE	06/21/2018

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3645535

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION EXT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION INT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO QUALIFICATION EXT 1	The Team and Product Identity Cloud Service (IDCS) is a strategic focus for Oracle. IDCS is uniquely placed among Oracle's new Cloud Services. It is a core infrastructure of the next generation Oracle Public Cloud since it is the Identity and Access infrastructure for all the IaaS, PaaS and SaaS services. It is also a key business service in Oracle's PaaS Services. Oracle has been a market leader in the Identity and Access Management space and IDCS is Oracle's next generation cloud based IAM platform The Role We are seeking highly accomplished versatile software professionals who can be part of the Identity Cloud Service (IDCS) Infrastructure Team. If you are self-driven and have a great combination of coding skills, design skills and have been part of large enterprise class software product development teams on Java and Cloud, have worked on development of services deployed on the popular Cloud platforms like Oracle Public Cloud, Amazon Web services or Azure then this position
TALEO QUALIFICATION EXT 2	is definitely a fit for you. You will be part of the team that is responsible for rolling out the IDCS product in the Oracle Public Cloud (OPC). You will integrate IDCS with the other infrastructure pieces to provide the core foundation for the next generation Oracle Public Cloud Infrastructure. You will also work with Oracle's IaaS services that we leverage for IDCS platform. About the Successful Candidate The successful candidate is self-motivated, progressive software professional with 7 years of industry experience or more, someone who can deal with complex problems without supervision. The candidate should have a learning mindset and should be a team player that is able to work with both internal and external teams. Bachelors or Master’s degree in Computer Science or a related field is desired. Responsibilities You will be responsible for building infrastructure software for a modern autonomous cloud service at scale with agility. You will be writing provisionin

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3645535

Field	Text
TALEO QUALIFICATION INT 1	The Team and Product Identity Cloud Service (IDCS) is a strategic focus for Oracle. IDCS is uniquely placed among Oracle's new Cloud Services. It is a core infrastructure of the next generation Oracle Public Cloud since it is the Identity and Access infrastructure for all the IaaS, PaaS and SaaS services. It is also a key business service in Oracle's PaaS Services. Oracle has been a market leader in the Identity and Access Management space and IDCS is Oracle's next generation cloud based IAM platform The Role We are seeking highly accomplished versatile software professionals who can be part of the Identity Cloud Service (IDCS) Infrastructure Team. If you are self-driven and have a great combination of coding skills, design skills and have been part of large enterprise class software product development teams on Java and Cloud, have worked on development of services deployed on the popular Cloud platforms like Oracle Public Cloud, Amazon Web services or Azure then this position
TALEO QUALIFICATION INT 2	is definitely a fit for you. You will be part of the team that is responsible for rolling out the IDCS product in the Oracle Public Cloud (OPC). You will integrate IDCS with the other infrastructure pieces to provide the core foundation for the next generation Oracle Public Cloud Infrastructure. You will also work with Oracle's IaaS services that we leverage for IDCS platform. About the Successful Candidate The successful candidate is self-motivated, progressive software professional with 7 years of industry experience or more, someone who can deal with complex problems without supervision. The candidate should have a learning mindset and should be a team player that is able to work with both internal and external teams. Bachelors or Master’s degree in Computer Science or a related field is desired. Responsibilities You will be responsible for building infrastructure software for a modern autonomous cloud service at scale with agility. You will be writing provisionin
TALEO INTERNAL OPEN DATE	21DEC17:03:00:00
TALEO INTERNAL CLOSE DATE	21JUN18:02:59:00
TALEO EXTERNAL OPEN DATE	21DEC17:03:00:00
TALEO EXTERNAL CLOSE DATE	22FEB18:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3755862

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3755862
DATE FROM	04/05/2018
VACANCY NAME	IRC3755862
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	18000DU1
MANAGER ID	889002748
MANAGER	Cengiz, Yasin
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Oracle Fusion HCM Cloud Applications
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	04/05/2018
INTERNAL POSTING END DATE	10/05/2018
EXTERNAL POSTING START DATE	04/05/2018
EXTERNAL POSTING END DATE	10/05/2018

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3755862

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION EXT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION INT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO QUALIFICATION EXT 1	The Oracle Fusion HCM Cloud Applications team is working on some of the most exciting technologies, implementing massively scalable reasoning, applying AI and analysis techniques to reason over large amounts of data. Our reasoning engine has its own implementation of MapReduce for distributed reasoning. We also work on data collection and connectors to Social Media Sources such as Facebook, LinkedIn, and Twitter for HCM recruitment applications. We integrate with Wearable Devices for another HCM product. Our group consists of approximately 300 engineers, with published authors, W3C members, field experts, patent-holders, and many graduates of elite schools such as MIT, USC, Stanford, and CMU. If you would like to have an impact on the Cloud Applications market then this position could be a fit. Responsibilities: * Design, develop and debug Oracle Fusion HCM Cloud Applications * Participate in the full life-cycle delivery of complex and innovative software applicati
TALEO QUALIFICATION EXT 2	ons * Write clean and effective code and pay good amount of attention to the code quality * Research new technologies and techniques as needed Qualifications/Skills: * BS or MS degree in Computer Science or related field * Strong skills in core Java and writing high performance Object-Oriented Programming code * Strong understanding of Object-Oriented Programming, SOLID principles and Design Patterns * Excellent problem solving skills * Experience with modern development tools (Eclipse, GIT, etc.) * Basic understanding of distributed systems, pattern recognition algorithms, and AI * Some background in algorithmic design and mathematics is nice to have * AI (Artificial Intelligence), ML (Machine Learning), and NLP (Natural Language Processing) experience is nice to have

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3755862

Field	Text
TALEO QUALIFICATION INT 1	The Oracle Fusion HCM Cloud Applications team is working on some of the most exciting technologies, implementing massively scalable reasoning, applying AI and analysis techniques to reason over large amounts of data. Our reasoning engine has its own implementation of MapReduce for distributed reasoning. We also work on data collection and connectors to Social Media Sources such as Facebook, LinkedIn, and Twitter for HCM recruitment applications. We integrate with Wearable Devices for another HCM product. Our group consists of approximately 300 engineers, with published authors, W3C members, field experts, patent-holders, and many graduates of elite schools such as MIT, USC, Stanford, and CMU. If you would like to have an impact on the Cloud Applications market then this position could be a fit. Responsibilities: * Design, develop and debug Oracle Fusion HCM Cloud Applications * Participate in the full life-cycle delivery of complex and innovative software applicati
TALEO QUALIFICATION INT 2	ons * Write clean and effective code and pay good amount of attention to the code quality * Research new technologies and techniques as needed Qualifications/Skills: * BS or MS degree in Computer Science or related field * Strong skills in core Java and writing high performance Object-Oriented Programming code * Strong understanding of Object-Oriented Programming, SOLID principles and Design Patterns * Excellent problem solving skills * Experience with modern development tools (Eclipse, GIT, etc.) * Basic understanding of distributed systems, pattern recognition algorithms, and AI * Some background in algorithmic design and mathematics is nice to have * AI (Artificial Intelligence), ML (Machine Learning), and NLP (Natural Language Processing) experience is nice to have
TALEO INTERNAL OPEN DATE	05APR18:03:00:00
TALEO INTERNAL CLOSE DATE	05OCT18:02:59:00
TALEO EXTERNAL OPEN DATE	05APR18:03:00:00
TALEO EXTERNAL CLOSE DATE	07OCT18:02:59:00

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3803639

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3803639
DATE FROM	08/02/2018
VACANCY NAME	IRC3803639
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	18000XWZ
MANAGER ID	892452696
MANAGER	Ousterhout, Rita Hanson
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Corporate Architecture
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle will consider for employment qualified applicants with criminal histories in a manner consistent with the requirements of San Francisco's Fair Chance Ordinance. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	08/02/2018
INTERNAL POSTING END DATE	02/01/2019
EXTERNAL POSTING START DATE	08/02/2018
EXTERNAL POSTING END DATE	02/01/2019

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3803639

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle will consider for employment qualified applicants with criminal histories in a manner consistent with the requirements of San Francisco's Fair Chance Ordinance. Oracle is an Equal Employment Oppor
TALEO DESCRIPTION EXT 2	tunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle will consider for employment qualified applicants with criminal histories in a manner consistent with the requirements of San Francisco's Fair Chance Ordinance. Oracle is an Equal Employment Oppor
TALEO DESCRIPTION INT 2	tunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
TALEO QUALIFICATION EXT 1	Linux Tools Developer Oracle's Linux kernel team seeks a tools developer to help with Linux kernel development. The role is intended to enhance or create existing tools which help Linux kernel developers to do their jobs. A successful candidate has expert level scripting and automation skills in addition to strong active listening skills. You should expect to listen to user concerns and to anticipate and develop creative solutions. Key qualifications include: - Self-motivated individual who can "think outside the box" and deliver creative solutions - Ability to collect requirements from developers, provide prototypes, and incorporate feedback - Experience developing tools on Linux platforms. Experience using and administering Linux systems is a plus. - Advanced level understanding of git source control - Strong experience with scripting languages including Perl, Bash, Python, and node.js - Experience building or supporting web ap

Vacancy ID: 3803639

Field	Text
TALEO QUALIFICATION EXT 2	plications (React, Angular, PHP) is a plus - Familiarity with C is a plus - Familiarity with Linux community and kernel development process - Excellent interpersonal skills - Excellent problem solving, critical thinking, and communication skills - Location: San Francisco Bay area Group Description: Oracle's Linux team develops on and contributes to upstream Linux to support our engineered system as well as Oracle's Cloud infrastructure. Our team patches and enhances the Linux kernel and promotes the adoption of Linux at Oracle and in the industry in general. Developers in this role are expected to be active contributors to upstream Linux. Through our experience with engineered systems such as the flagship Exadata, we created an additional kernel option, the Unbreakable Enterprise Kernel. Supporting engineered systems required us to be more innnovative and modern with the Linux kernel, and UEK is a Linux kernel which combines mainline Linux
TALEO QUALIFICATION INT 1	Linux Tools Developer Oracle's Linux kernel team seeks a tools developer to help with Linux kernel development. The role is intended to enhance or create existing tools which help Linux kernel developers to do their jobs. A successful candidate has expert level scripting and automation skills in addition to strong active listening skills. You should expect to listen to user concerns and to anticipate and develop creative solutions. Key qualifications include: - Self-motivated individual who can "think outside the box" and deliver creative solutions - Ability to collect requirements from developers, provide prototypes, and incorporate feedback - Experience developing tools on Linux platforms. Experience using and administering Linux systems is a plus. - Advanced level understanding of git source control - Strong experience with scripting languages including Perl, Bash, Python, and node.js - Experience building or supporting web ap
TALEO QUALIFICATION INT 2	plications (React, Angular, PHP) is a plus - Familiarity with C is a plus - Familiarity with Linux community and kernel development process - Excellent interpersonal skills - Excellent problem solving, critical thinking, and communication skills - Location: San Francisco Bay area Group Description: Oracle's Linux team develops on and contributes to upstream Linux to support our engineered system as well as Oracle's Cloud infrastructure. Our team patches and enhances the Linux kernel and promotes the adoption of Linux at Oracle and in the industry in general. Developers in this role are expected to be active contributors to upstream Linux. Through our experience with engineered systems such as the flagship Exadata, we created an additional kernel option, the Unbreakable Enterprise Kernel. Supporting engineered systems required us to be more innnovative and modern with the Linux kernel, and UEK is a Linux kernel which combines mainline Linux
TALEO INTERNAL OPEN DATE	02AUG18:03:00:00
TALEO INTERNAL CLOSE DATE	02FEB19:02:59:00
TALEO EXTERNAL OPEN DATE	.
TALEO EXTERNAL CLOSE DATE	.

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3809723

Field	Text
POSTED JOB NAME	10540.Software Developer 4.PRODEV.SWENG.IC4
POSTED JOB CATEGORY	PT1
VACANCY ID	3809723
DATE FROM	05/11/2018
VACANCY NAME	IRC3809723
VACANCY STATUS	Closed - Filled
NUMBER OF OPENINGS	1
TYPE OF OPENING	New
TYPE OF POST	Regular Employee Hire
TALEO REQ TYPE	Professional
TALEO REQ NUMBER	18000JMC
MANAGER ID	167185
MANAGER	Chui, Mr Chi Ching
ORGANIZATION NAME	Oracle America, Inc.
DEPARTMENT DESCRIPTION	Database Security Development
BRIEF POSTING DESCRIPTION	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gender identity, disability and protected veterans status or any other characteristic protected by law.
DETAILED DESCRIPTION	
JOB REQUIREMENTS	
ADDITIONAL DETAILS	
INTERNAL POSTING START DATE	05/11/2018
INTERNAL POSTING END DATE	11/10/2018
EXTERNAL POSTING START DATE	05/11/2018
EXTERNAL POSTING END DATE	11/10/2018

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3809723

Field	Text
TALEO DESCRIPTION EXT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION EXT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO DESCRIPTION INT 1	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc. As a member of the software engineering division, you will take an active role in the definition and evolution of standard practices and procedures. You will be responsible for defining and developing software for tasks associated with the developing, designing and debugging of software applications or operating systems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience. Oracle is an Equal Employment Opportunity Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, gend
TALEO DESCRIPTION INT 2	er identity, disability and protected veterans status or any other characteristic protected by law.
TALEO QUALIFICATION EXT 1	Principal Data Security Cloud Service UI Developer – Redwood City, CA Overview: Oracle Database Security is building a new Data Security Cloud Service to unify the data security management. This Cloud Service will help customers to secure their data from both internal and external attacks. The service will evaluate the risk on the systems by understanding the data, users and configuration. With the built-in intelligent of the service, it can provide security controls to prevent unauthorized data access, monitor the database activities and detect threats. Responsibilities: As a member of the software engineering division, you will assist in defining and developing software for tasks associated with the developing, debugging or designing of software applications or operating systems. Provide technical leadership to other software developers. Specify, design and implement a new product. Requirements: - Experience in UI design and development - Experience in
TALEO QUALIFICATION EXT 2	Angular JS or Oracle JET - Experience in Java, Java Script, REST API, JSON, OSGi - Experience in building web based UI - Experience in building Enterprise scale software - Knowledge in Oracle database and database a big plus

Attachment D - Sample of 20 Job Requisitions for Software Developer 4

Vacancy ID: 3809723

Field	Text
TALEO QUALIFICATION INT 1	Principal Data Security Cloud Service UI Developer – Redwood City, CA Overview: Oracle Database Security is building a new Data Security Cloud Service to unify the data security management. This Cloud Service will help customers to secure their data from both internal and external attacks. The service will evaluate the risk on the systems by understanding the data, users and configuration. With the built-in intelligent of the service, it can provide security controls to prevent unauthorized data access, monitor the database activities and detect threats. Responsibilities: As a member of the software engineering division, you will assist in defining and developing software for tasks associated with the developing, debugging or designing of software applications or operating systems. Provide technical leadership to other software developers. Specify, design and implement a new product. Requirements: - Experience in UI design and development - Experience in
TALEO QUALIFICATION INT 2	Angular JS or Oracle JET - Experience in Java, Java Script, REST API, JSON, OSGi - Experience in building web based UI - Experience in building Enterprise scale software - Knowledge in Oracle database and database a big plus
TALEO INTERNAL OPEN DATE	11MAY18:03:00:00
TALEO INTERNAL CLOSE DATE	11NOV18:02:59:00
TALEO EXTERNAL OPEN DATE	11MAY18:03:00:00
TALEO EXTERNAL CLOSE DATE	13NOV18:02:59:00

DECLARATION OF RIDDELL ISO MOTION TO SEAL

EXHIBIT E

EXHIBIT H

EXHIBIT H

EXPERT REPORT OF ALI SAAD, Ph.D.

In the matter of
Office of Federal Contract Compliance Programs,
United States Department of Labor, Plaintiff,
v.
Oracle America, Inc., Defendant.

OALJ Case No. 2017-OFC-00006

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ASSIGNMENT

1. I was retained by counsel for defendant Oracle America, Inc. ("Oracle") in my capacity as a labor economist to evaluate the claims made by the OFCCP in their Second Amended Complaint ("SAC") against Oracle. The OFCCP alleges that its "continued evaluation of Oracle's employment practices reveals widespread discrimination at HQCA" – in particular, "that Oracle discriminated against women, Asians, and African Americans or Blacks in compensation."[1] The OFCCP further alleges that "Oracle paid women and Asians less at hire, either by suppressing their pay relative to other employees in the same or comparable job, or by hiring them for lower-paid jobs," and that Oracle "place[s] [female, Asian, and Black or African American] employees in lower global career levels."[2] To address these allegations from a statistical perspective I was provided with electronic human resources data, payroll data, performance review system data, and other documents related to Oracle, including depositions and company policy documents. I have been provided with the OFCCP's backup materials that produced the numbers contained in the SAC, and have thus been able to fully replicate and evaluate those analyses. My initial report responds to the allegations and the associated analyses summarized in the SAC. I may supplement this report at a later date if additional relevant information is made available to me.

QUALIFICATIONS

2. I am the Managing Partner of Resolution Economics Group LLC, a firm whose activities include performing economic and statistical analyses in connection with litigation and other consulting matters. Before beginning my consulting career I was a tenure track member of the faculty of the economics and finance department at Baruch College of The City University of New York. While there I taught labor

[1] Second Amended Complaint, in the matter of *Office of Federal Contract Compliance Programs, United States Department of Labor, Plaintiff, v. Oracle America Inc., Defendant*, United States Department of Labor, Office of Administrative Law Judges, OALJ Case No. 2017-OFC-00006 OFCCP No. R00192699, March 8, 2019, paragraph 11.
[2] SAC, paragraph 22.

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economics, micro and macroeconomics, econometrics, and economic history. In connection with my consulting, I have extensive experience providing statistical and economic analyses in connection with company pay equity studies, evaluations of compensation systems, and class action employment cases, including employment discrimination and wage and hour matters. I have also published and lectured on these topics. A consistent focus of my work has involved economic and statistical analysis related to claims of systemic gender discrimination. In the litigation context, I have significant experience in analyzing complex data for the purpose of assisting counsel in evaluating both class certification and liability, including in compensation discrimination cases. I hold a Ph.D. in Economics from The University of Chicago, and a B.A. in History and Economics from The University of Pennsylvania. I have been qualified as an expert witness in both Federal and State Courts. My resume, including all publications and testimony over the past four years, is attached to this report as Attachment A. My firm bills for my services at my current hourly rate of $750 per hour.

DATA AND DOCUMENTS

3. I was provided by Counsel with databases, depositions, and other documents. In addition, I collected publicly available data, and relied on additional secondary materials. The materials I was provided for consideration in connection with my analysis and opinions are listed in Attachment B.

SUMMARY OF FINDINGS

4. I have been asked to evaluate and respond to the statistical analyses described in the SAC, and the claims that the OFCCP makes on the basis on them. In sum, it is my professional opinion that the OFCCP ignored the complexity of work employees perform at Oracle and applied an overly simplistic model of compensation. They mis-measured variables—including the key outcome variable, total

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compensation—and omitted other important variables that would serve to similarly situate employees from a labor economics perspective. When additional variables readily available in the data are introduced even into their aggregated models – which I show mask considerable variation in outcomes – the results OFCCP claims to have found no longer exist. In addition, their statistical models of starting pay and "assignment" are also fundamentally mis-specified and contrary to the statements found in the SAC, do not lend support to the OFCCP's claims regarding pay discrimination. OFCCP's results do not stand up under scientific scrutiny and are an unreliable basis for drawing conclusions about compensation at Oracle.

5. In the SAC, the OFCCP claims that Oracle engages in "widespread discrimination at HQCA" – i.e., at Oracle's headquarters location in Redwood Shores, California.[3] It is my understanding that the claims relate to the pay of women, Asians, and African-Americans. It is also my understanding that of the 16 high-level job functions at Oracle HQCA, the OFCCP only brings claims related to three of them.[4] The OFCCP's primary focus is on pay, with other analyses such as starting pay and job "assignment" relied upon by them in support of their pay analyses.

6. To support their claims of discriminatory pay disparities, in their SAC the OFCCP presents a series of tables summarizing statistical analyses performed by year and by each of the three job functions OFCCP alleges are at issue. The statistical method OFCCP used to study pay is multiple regression analysis, which in general terms seeks to study the relationship of pay to a set of factors thought to influence pay, and once these factors are properly identified and measured, to then determine whether gender or race are also factors that appear to impact or relate pay. Multiple regression is a technique that is often used by labor economists to study pay and when used properly, can be effective and informative. However, when it is not used correctly, conclusions based on regression results can be highly misleading.

[3] SAC, paragraph 11.

[4] Job functions are broadly interpreted as the general "type" of work, such as Sales, Administration, etc. (Waggoner, Kate_2019.05.01_Depo Ex 03.PDF, ORACLE_HQCA_0000042098-20) The three Job Functions at issue in this case are Product Development, Information Technology, and Support.

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7. As discussed below, it is my opinion that the analyses presented by OFCCP in the SAC were not performed correctly, because they leave out or mis-measure a number of important pay-related factors and also because they aggregate the statistical analysis over employees who are too diverse for the model they use.[5] As a result, from a labor economics perspective, the analyses presented in the SAC do not serve to similarly situate employees with respect to the work they are doing at Oracle, which is highly complex and widely varying, or with respect to the skills and abilities that they bring to bear on that work. Furthermore, it does not appear that OFCCP's analyses in the SAC accurately model or reflect Oracle's pay system and practices, which involve decisions by multiple managers within different lines of business (LOBs) that cut across the three job functions OFCCP examined. For these reasons, and as explained more fully below, the pay analyses presented in the SAC are not a reliable basis upon which to conclude that Oracle's managers discriminated against women or minorities with respect to pay. I show that introducing additional readily available variables from the data that more closely track work performed and employee skills and abilities – even if one maintains the highly aggregated structure OFCCP selected – generates entirely different results that are inconsistent with an allegation of a pervasive pattern of discrimination.

Multiple regression analysis can be a useful tool, but can be misused and generate misleading results if not appropriately tailored to the particular data and practices being studied.

8. Before getting into the details of why the OFCCP's multiple regression analyses in this case are flawed, it is important to first discuss this technique in general terms. Multiple regression is a statistical tool that is designed to explain or relate a variable of interest, such as pay, to a number of factors we think may impact pay, in order to understand what factors drive pay and by how much. For example, in many companies we would expect something like education to impact pay. Suppose we want to know by how much a Ph.D. increases pay when compared to a B.A. or M.A. degree. It would be incorrect to simply compare the average earnings of employees with a Ph.D. to the average earnings of employees with either

[5] Because I was provided with the backup computer programs and data sets used to create the results in the SAC, I have been able to fully review and evaluate the methodology used by the OFCCP.

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a B.A. or an M.A. The reason is clear: employees with a Ph.D. might have not only more education than the other two education groups, but may also possess more (or less) relevant work experience. They may also be concentrated in different places within the company relative to the other two groups – that is, they may work on different types of projects, in different departments, or in different kinds of roles. Given these issues, simply comparing average pay by educational grouping will not tell us the impact of a Ph.D. *alone* on pay; it will mix the effects of a number of other factors that happen to correlate to having a Ph.D. We want to understand what difference having a Ph.D. makes *holding constant* relevant work experience, work department, etc. A multiple regression allows you to figure this out by simultaneously measuring the impact of all factors, which permits the analyst to isolate the impact of any one factor alone. In this way, you can, for example, say that a Ph.D. raises earnings by $10,000 per year, holding other job-related factors in the model constant.[6] Similarly – and as particularly relevant here – one can in theory use multiple regression to study whether employees' gender or race influences pay, holding other job-related factors in the model constant, as a way to investigate whether the data is consistent with a hypothesis of pay discrimination. Of course, in order to conclude that gender or race are related to pay, one would first have to model the other pay related factors correctly, because if those factors are incomplete or are not measured correctly, it could produce a "false positive," where we conclude we find that gender is related to pay when in fact we left out a pay related variable that would have eliminated this finding.

9. Getting the regression model right is crucially important if one attempts to use these analyses in discrimination cases, because discrimination itself is not something an analyst can observe. Unlike prior educational attainment, or the current job title a person person occupies – whose effects on pay can be *directly* measured because the factors causing these effects can themselves be directly measured – "discrimination" can ever only be inferred. This is because the variable used to infer it (gender or race) is

[6] In a preview of something I will discuss below, however, simply including a relevant factor (or set of factors) in a model may not be sufficient. For example, if the nature of the project worked on also influences pay, and if Ph.Ds. tend to work on different projects than employees without Ph.Ds., leaving out project in the multiple regression would distort the measured impact of (or "coefficient for") a Ph.D. on pay by conflating the impact of project with the impact of educational degree.

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only a proxy and not a directly observable pay-impacting variable such as education.[7] But that inference will be inappropriate and unsupported if the model is poorly constructed or omits important factors that influence pay for employees in the model. In such a circumstance, the impact of those other omitted factors on pay may end up erroneously being attributed to some factor that *is* in the model, like gender or race. Because these types of errors are found throughout the OFCCP's models, their analyses are unreliable and do not support their conclusions about the impact of gender or race on pay at Oracle.

<u>The OFCCP's pay analysis is flawed and does not support any inference of pervasive pay discrimination against women, Asians, or African-Americans.</u>

<u>The OFCCP fails to measure pay – the variable they are studying – correctly.</u>

10. The problems with the OFCCP's statistical analyses start right up front with their measure of total compensation, which is used to generate the alleged pay differences and very high damages estimates presented in the SAC. This is because the OFCCP measures total compensation incorrectly. Instead of identifying and analyzing the specific compensation awarded to each employee for work performed in a given year by summing up base pay, annual bonus, and shares or options awarded *in that year*, the OFCCP uses a measure of W-2 take-home pay that does not align stock awards to the year in which they were actually earned, and is impacted by employee choices (for example, regarding how much to place in their 401(k) or whether to exercise stock options earned in previous years). An employee's W-2 earnings can include compensation that was awarded years earlier, even back to when they were hired or were in a different job or department. If the purpose of the regression analysis is to compare earnings of employees in a particular year based on their pay-related characteristics measured that same year, one should not use the W-2 data. Because the OFCCP does not measure employee pay correctly, they fail to correctly evaluate the impact of other factors on the pay actually received by different employees in a given year.

[7] I put "discrimination" in quotes here to reflect the fact that a regression analysis cannot on its own conclude there is discrimination from an analytical perspective. Instead, gender or race differences should be referred to as "unexplained" gender or race differences, given the variables included in the model. The reader should understand that when I use the term discrimination here and elsewhere in this exposition I am simply referring to unexplained adverse differences by gender or race.

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The OFCCP fails to distinguish employees performing different work.

11. Another fundamental flaw is that the OFCCP's model effectively groups together employees who are not performing similar work from a labor economics perspective, making any comparisons between employees in those groups irrelevant at best and misleading at worst.

12. The OFCCP's analysis aggregates together all employees who share a high-level Job Function like "Product Development" or "Support." OFCCP's model then controls for differences among employees within these functions using a handful of variables, as described in the SAC.[8] Four of the seven variables in OFCCP's model – standard job title (or job code), job specialty, global career level ("GCL"), and FLSA exempt status – all boil down to a single variable. This is because a given standard job title is associated in a given year with only one job specialty, one GCL, and one FLSA exempt status, so adding those latter three variables adds nothing to the analysis. As a result, their models really only control for four factors: standard job title, part-time/full-time, time in company, and "previous experience."

13. The first of these four factors – standard job title – appears intended to describe the work performed by a given employee; the next three – part-time/full-time, time in company and previous experience – appear intended to describe features of individual employees that might make them more or less `productive in that work. But none of these factors – viewed in isolation or together – suffice for those purposes. For example, one of the variables OFCCP uses to distinguish employees in their current positions – part-time versus full-time – has very little impact, as 99% of the employees in the analysis are full-time.

14. Perhaps most importantly, from a labor economist's perspective the control for Oracle "standard job title" is not sufficient to similarly situate employees in the regression analysis. As shown in detail below, standard job title does not accurately specify the nature of work performed by different employees. Employees performing highly similar work would generally be expected to be paid within a relatively

[8] The pay-related factors they control for in their models are "time in company, previous experience, FLSA exempt status, part time or full time, global career level, job specialty and standard job title." SAC, paragraph 13.

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narrow range; the underlying economic principle that generates this result is that a company will generally not choose to pay one employee (say) five times more than the employee next to her if they are truly doing similar work and contributing similar value to the company. But at Oracle, employees within the same standard job title often earn vastly different amounts, even after controlling for the other factors in OFCCP's model. By way of example, employees in one of the largest job titles in the data, Software Developer 4s, earned total compensation ranging from [redacted] in 2014. Simply sharing a standard job title does not serve as a sufficient measure of work performed, and does not do enough on its own to similarly situate employees from a labor economics perspective. Standard job titles instead appear to be a system of classification – much like job function, job specialty, and GCL – that groups together employees whose work may share some general features but in fact differ significantly. This wide range in pay for Software Developer 4 holds up even when taking the other variables into account that the OFCCP uses in its regression model.

<u>The OFCCP's models ignore relevant experience and other important factors impacting pay.</u>

15. The OFCCP introduces two additional factors into its analyses as purported controls for relevant, job-related experience. But these measures are completely inadequate given the characteristics of the work and workers at Oracle, and the diverse set of jobs and employees across the three Job Functions they have analyzed. As for "previous experience," the measure used by OFCCP is simply the employee's age minus 18 minus years since hire at Oracle America, Inc. There are several things wrong with this measure.

a. First, the number of years is not important on its own. Instead, what also matters to a labor economist is what *type* of work was performed prior to working at Oracle America, Inc. Was it years of technology work, and if so, what specific type? Where was the work performed – another leading international technology company, or a small startup? OFCCP's model does nothing to capture these differences in *relevant* prior experience, which can matter significantly for pay decisions.

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b. Second, the OFCCP fails to measure and take account of number of years employees may have worked at an Oracle affiliate overseas or in an acquired firm. Many employees in the data previously worked at an Oracle affiliate outside of the USA, which plausibly constitutes relevant experience in many cases, as would work performed at a company later purchased by Oracle to continue its work "in house." OFCCP's model does not credit these employees with this type of experience.

c. Finally, the number of pre-Oracle work years in OFCCP's model does not account for leaves of absence, periods of unemployment or being absent from the labor force, and thus does not actually compare employees who have spent equivalent amounts of time at work, enhancing their job-related skills and abilities. In the context of gender, this can be particularly important; there is a large body of labor economics research that examines the differences between male and female labor force participation and leave-taking, and the consequent impact on work experience and hence earnings.[9]

16. The points above relate to problems with the variables the OFCCP *did* use. However, as I detail below, they failed to use many other variables that are also important in explaining pay at Oracle. Examples are: whether or not an employee had a patent, employee tenure in current standard job title, employee tenure at non-USA Oracle affiliates, organization variables that relate to the types of work and products employees work on, and other variables that can be created with the information provided that allow refinements to the very coarse standard job title control the OFCCP's model relies upon. It is my

[9] Hellerstein, Judith K. and David Neumark, (2006) "Using matched employer-employee data to study labor market discrimination," *Handbook on the Economics of Discrimination*, edited by William M. Rogers III, Edward Elgar, pp. 34. Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz (2010). "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors." *American Economic Journal: Applied Economics*,2(3): 228-55. Goldin, Claudia. (2014) "A grand gender convergence: Its last chapter." *The American Economic Review* 104, no. 4: 1091-1119. Blau, Francine D., and Lawrence M. Kahn. (2017) "The gender wage gap: Extent, trends, and explanations." *Journal of Economic Literature* 55, no. 3: 789-865. Spivey, Christy (2005). "Time off at what price? The effects of career interruptions on earnings" *ILR Review*, *59*(1): 119-140. Waldfogel, Jane (1998). "Understanding the "family gap" in pay for women with children." *Journal of Economic Perspectives*, 12(1): 137-156. Angrist, Joshua D., Stacey H. Chen, and Jae Song. (2011) "Long-Term Consequences of Vietnam-Era Conscription: New Estimates Using Social Security Data." *American Economic Review*, 101 (3): 334-38.

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understanding that all of this information was available to the OFCCP at the time they filed the SAC, and yet none of it was used in producing the statistical results summarized in the SAC

17. In a complex workforce such as that at Oracle, many variables are correlated to one another. It is all the more important therefore to get the basic model right before attempting to infer that there is any relationship at all, let alone a meaningful one, between pay and gender or race. But the flaws in the OFCCP's models are so fundamental and pervasive that they are not a statistically sound or reliable basis on which to draw inferences regarding the key issue the OFCCP is focused on: whether there are adverse pay outcomes for women and minorities in the segments of Oracle being studied.

Correcting these errors eliminates the adverse results OFCCP claims to have found.

18. I have performed a number of alternative analyses of compensation – starting with the OFCCP's model, leaving intact its aggregation up to job function (which I do not concede as correct), and introducing additional refinements that are readily available in the data in this case – and I reach very different conclusions. In the analytical work I performed, I have added a number of variables that are related to pay and have corrected the various measurement errors in the OFCCP's model. I find that the pay differences shrink considerably and the majority are not statistically significant. In fact, I find a number of positive relationships between total compensation and gender or race, respectively, undermining the claim that there is a consistent pattern of results adverse to women and minorities. These results do not support an inference of pay discrimination; instead, they are inconsistent with a hypothesis that Oracle managers systematically treat women, Asians, or African-Americans worse than white male employees with respect to pay.

The OFCCP presents misleading bottom-line averages over broad groups of employees in different levels and management chains, obscuring substantial variability that undermines their claim of a pattern of company-wide pay discrimination.

19. The issues above highlight one type of way in which the OFCCP's analyses in the SAC suffer from what economists call "specification bias" – that is, the bias that occurs where variables are measured

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incorrectly (prior experience, job performed, etc.), or when important variables are left out (type of prior experience, Oracle affiliate experience, patent activity, leaves of absence, etc.).

20. Closely related to this type of specification bias is another problem: one that results from applying a single model across too broad and diverse a group of employees. This is problematic – even in instances where a model is well-designed – because pay regressions by their nature only produce results that show the *average effect* of each factor studied on employee pay. Here, given the stark differences in the type and level of work performed by different employees across and within the three high-level Job Functions, this average can be highly misleading. The average can significantly overstate the value of a given factor (say, time at Oracle America) for some employees, and understate it for others. As a result, the one-size-fits-all model does not properly account for the differing impact of different pay-related factors in different types of roles, which undermines the reliability of conclusions about the impact of these and other factors – including gender and race – on pay.

21. To summarize: The problem associated with running a regression model on a widely varying employee population is that when a model mixes apples and oranges into one pooled analysis, and estimates only the *average* impact of each variable (as regression models by design do), that average masks considerable underlying variability.[10] The differences among employees created by their diverse attributes and a diverse spectrum of types of work that generate this variability could be addressed through more refined groupings or pay factors, which in turn would give more reliable measurements of pay outcomes and differences. But OFCCP's analyses do not incorporate the needed refinements.

22. Another symptom of the "specification bias" created by performing overly aggregated regression models like the one OFCCP used is that they do a poor job of predicting pay for individual employees. For example, if a well-specified model is applied to an employee population in which the included factors impact pay in a consistent manner, knowing the characteristics of a particular individual would permit the analyst to use the regression coefficients (averages based on the group) to compute what is referred to as

[10] The fact that a variable is statistically significant does not fully cure this problem, since statistical significance is not simply an indicator of the average effect being the product of tightly bunched separate effects per employee, but also by very large numbers of observations in the data.

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"predicted" or "fitted" pay. One can compare the "predicted" or "fitted" value for a given employee – which is what the regression says "should be" the pay of an individual based on the average regression outcomes of the included factors across *all* employees – to the actual pay of *that* person. If the differences between actual pay and a model's predictions of pay are substantial for many individual employees, that can indicate either: (a) a poorly designed model (i.e., one that omits or mis-measures important factors), or (b) a model applied to such a diverse employee group that even if it has all the right variables for analysis of some more homogeneous subset, those variables apply in very imprecise ways to many individual employees in an overly aggregated situation. Such a dispersed set of predictions should indicate to the analyst trying a one-size-fits-all approach that something is wrong with the model: either its structure, or its application to dissimilar employees. And that is precisely what one sees in the results generated by the OFCCP's model when they are carefully examined, rather than obscured by presenting only average, group-wide results.

23. Another problem with the bottom-line results that OFCCP presented in the SAC is that they are inconsistent with outcomes that OFCCP's own model generated for other employees at HQCA, but that OFCCP failed to report. As noted above, the OFCCP has focused only on three of the 16 job functions at Oracle HQCA. This is because the model they used as a basis for the NOV – which is essentially the same model carried forward into the SAC – failed to find any pay differences for women and race groups in a variety of pockets of that data. They did not report these statistically insignificant results in their NOV or SAC, but their backup contains them. In addition, the backup underlying the SAC contains many other results of running the exact same models on other employee groupings at HQCA, which show no statistically significant relationships between gender or race. These findings undermine any inference that Oracle's managers consistently and systemically discriminate against women and minorities when it comes to pay, and instead are consistent with the OFCCP having a poorly specified model that does not generate reliable or meaningful conclusions.

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The OFCCP's starting pay analysis is seriously flawed

24. The OFCCP's claim that they have identified "causes" of the pay discrimination they allege is also analytically unsupported. First, the OFCCP alleges in the SAC that Oracle "relied" on prior pay in setting starting pay, with the result that protected groups end up with lower pay once in the company.[11] But their starting pay analysis groups together all employees hired into the same global career level, without any control for even the standard job title into which an employee was hired or to which she applied. Such an analysis is completely incorrect in the context of Oracle: GCLs are very broad employee groupings, within which there can be many different jobs and types of work. Requisitions for hire are not posted by "global career level" – they are at the standard job title level and, as I demonstrate below, further specify very detailed types of skills and experience relevant to different posted positions under the same standard job title. At the very least, to be consistent with their overall compensation models, OFCCP should have conducted their starting pay analysis by controlling for standard job title. Below, I show that when properly done, there is no difference in starting pay adverse to women, Asians, or African-Americans.

25. In addition, the OFCCP's starting pay model does not demonstrate any causal connection between prior pay and starting pay at Oracle, but instead only a correlation. But there is a common-sense reason why one would expect to see a strong correlation between prior pay and starting pay for hires into any company, even absent any "reliance" on (or even knowledge of) applicants' prior pay. To the extent that particular skills are sought at the target company, applicants with those skills—who are already getting paid elsewhere for the value of those skills—will generally be the ones hired. I demonstrate below that this correlation is found in the economy as a whole.

26. For the OFCCP to support any stronger causal claims given the expected background correlation, they would have to show that ***holding constant the skills brought to the table by applicants***, starting pay decisions by Oracle managers deviate from these skills in ways only explained by reliance on prior pay itself. But the OFCCP has not suggested this at all, much less shown it.

[11] SAC, paragraph 32.

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The OFCCP's "job assignment" analysis is flawed because it ignores the job application process.

27. The OFCCP also attempts to argue that Oracle "assigns" or channels women and minorities into lower-level (and thus lower-paying) jobs.[12] But the analysis they offer as support for this claim—focused exclusively on so-called "experienced" hires—simply looks at the standard job titles and associated global career levels into which various employees are hired, with no regard to the position(s) at Oracle for which they actually *applied*. The OFCCP's analysis thus does not focus on decisions made by Oracle, but instead just catalogs where workers arriving to Oracle via the experienced labor market end up when they join Oracle. In additiona, the OFCCP does not utilize the extensive data and information available regarding the external applicant process (which I understand was available to the OFCCP), which makes clear that applicants apply against and are hired into particular, position-specific requisitions. Once one uses this data, and analyzes hires in light of the postings to which candidates applied, there is no meaningful difference in where applicants of different genders or races end up: the vast majority of successful applicants—men, women, whites, and minorities—start in the standard job title and global career level associated with the position to which they applied. The OFCCP's analysis ignores the application process altogether and thus does not demonstrate any "assignment" by Oracle adverse to women or minorities.[13]

There is no gender or race difference in pay growth.

28. The OFCCP also analyzed growth in base pay in Product Development from 2003-2016 and concluded that Asians and women "experienced slower wage growth […] to a statistically significant degree," though they do not show or otherwise describe in the SAC the statistical coefficients they claim to have generated.[14] They also did not analyze women in the other two job functions to show that their argument was consistent across the company. Their model also does not account for whether someone took a leave of absence during the year, whether they received a patent bonus during the year, their career

[12] SAC, paragraphs 18-21.
[13] The OFCCP presents no analysis of the steering of applicants to apply to positions below their true capabilities, nor does the OFCCP mention this issue.
[14] SAC, paragraphs 30-31.

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level or their organization. A corrected model shows there is no pattern of statistically significant differences in wage growth by gender in any of the three job functions. Among Asians in PRODEV, there are also no statistically significant differences in wage growth. These findings are inconsistent with the OFCCP hypothesis that pay differences between men and women, or between Asians and Whites, widen over time.

The OFCCP selectively reported results in the SAC.

29. The OFCCP claims that women are discriminated against in the PRODEV, INFTECH and SUPPORT job functions, as are Asians in PRODEV, but not Asians in INFTECH and SUPPORT. In addition, the OFCCP reported only half of their results regarding initial placement for Asians in PRODEV. The SAC describes how Asians are 49% as likely as Whites in PRODEV to be "assigned" into higher global career levels as managers. Their back-up also contains unreported results for non-managers in the IC career levels. In the IC career levels, their own results show that Asians are *more likely* to be placed in the higher levels than are Whites, though the difference is not statistically significant.

30. The OFCCP also claims in the SAC that pay disparities between men and women widen the longer they are at Oracle. However, they only show the results for women in PRODEV. When I apply thethe OFCCP's statistical model to women in INFTECH, I find that the pay gap generated by their model is adverse to women and statistically significant in the 1-3 year tenure group, but that this gap falls in size with tenure and is positive for women in the highest tenure band. In SUPPORT the trend is similar to PRODEV but the pay gap in the youngest tenure band is not statistically significantly different from zero, which would imply (according to the OFCCP interpretation of these analyses) that Oracle does not suppress pay early on but suddenly decides to do so later. There are methodological issues with these analyses, but these results are based on the OFCCP methods and the results they chose not to present, and demonstrate how the OFCCP's claims lack support from within their own analyses.

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There is no basis to conclude that damages are owed.

31. In the SAC, the OFCCP computes alleged damages for women, Asians, and African-Americans in a formulaic fashion based on the average pay gaps generated by their statistical model. The refined analyses presented herein show that there is no pattern of adverse pay results for women. Thus, from a statistical perspective, there are no damages to estimate for them.

32. My refined analyses also show that there is no unexplained pay disparity between Asians and white employees, and thus no basis for damages. It is worth noting that the OFCCP's calculation of damages for Asians in the SAC are in fact calculated only for Asian men (because Asian women were included in their damages calculations for women), but the OFCCP failed to use an Asian men-only version of their model to estimate these damages. When their analysis is restricted just to Asian men, even using their flawed model, there are no statistically significant pay gaps in half of the years they analyze, meaning there is no evidence of a systematic pattern of adverse outcomes upon which to base damages.

33. The OFCCP also claims in the SAC that African American employees are owed damages, but their analysis for this employee group alone was based on base salary, not total compensation. The focus on base pay rather than total compensation for African-Americans alone is entirely unexplained in the SAC. Employees at Oracle earn total compensation, not base pay alone. When OFCCP's pay model is run using their measure of total compensation (flawed though it is), their own model shows no statistically significant differences in total compensation between African-American and white employees. Again, their own model shows that no damages are owed.

34. In summary, and to wrap up this overview, the OFCCP has applied overly simplistic statistical methods in their pay analyses, fraught with mis-measured and/or missing variables. They have used unsupportable approaches and mis-specified models in their starting pay and "assignment" analyses. Oracle is a large, sophisticated technology company that employs people doing varied and highly complex work. The simplistic approach of the OFCCP – which ignores crucial facts about the specific work and workers at Oracle – fails to produce any reliable results, and OFCCP's conclusions based on their simplistic model do not stand up to scrutiny. Even if one adopts the aggregated approach OFCCP

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uses, modifications to their model based on readily available information they had but did not use yield results that are not significant and do not suggest any pattern of pay discrimination. I now proceed to explain each of these findings in more detail, and begin – as one should when seeking to study compensation at a company – with a careful look at the specific company and employees at issue.

ORACLE IS A HIGHLY DIFFERENTIATED AND EVOLVING TECHNOLOGY COMPANY, WHOSE EMPLOYEES PERFORM A WIDE ARRAY OF WORK THAT REQUIRES VARYING SKILLS, ABILITIES, AND COMPETENCIES AND CONTRIBUTE DIFFERENT VALUE TO THE COMPANY

Oracle is a large complex company with widely varying employees working on complex products and services

35. The Oracle Corporation (the parent company of Oracle America, Inc.[15]) is a global company offering a wide variety of complex products and services. It employs 137,000 people worldwide, including 38,000 developers and engineers, 14,000 support and services specialists and 19,000 implementation consultants. Oracle employees hold more than 18,000 patents worldwide.[16] The products the company focuses on change over time, such that over a five year period many products cease to be a focus for the company, while others emerge and become business critical.[17]

36. The employee groups at issue in this case span three job functions (Product Development, Information Technology, and Support) at Oracle's headquarters location HQCA. The employees at

[15] https://www.sec.gov/Archives/edgar/data/1341439/000119312510151896/dex2101.htm, accessed July 19, 2019.
[16] http://www.oracle.com/us/corporate/oracle-fact-sheet-079219.pdf, accessed June 18, 2019.
[17] "Because not all products and services have the same value to Oracle, the value of the skills, duties, and responsibilities necessary to develop, enhance, or service Oracle's wide array of products and services also differs and changes over time. For example, (and there are plenty more, twenty years ago, employees skilled in Siebel technologies were highly sought after in the marketplace. Today, by contrast, there is high demand for (and comparatively limited supply of) employees with experience specifically in cloud-based technologies and artificial intelligence. As technology continually changes and develops, the competition and market demand for employees skilled in the latest technologies also changes, meaning the value to Oracle of various skills, duties and knowledge also fluctuates over time." Declaration of Steven Miranda in Support of Defendant Oracle America, Inc.'s Motions for Summary Judgment or, in the Alternative, Summary Adjudication, in the matter of *Rong Jewett, Sophy Wang, Xian Murray, Elizabeth Sue Petersen, Marilyn Clark and Manjari Kant, v. Oracle America, Inc.*, Superior Court of the State of California, County of San Mateo, Case No. 17CIV02669, January 17, 2019, paragraph 7 (ORACLE_HQCA_0000607281.pdf)

HQCA in the job functions at issue are very diverse: they span dozens of different standard job titles, from employees in entry-level positions straight out of college up to Senior Vice Presidents with 30 or more years of work experience.

37. There are 8,465 unique employees at HQCA in the PRODEV, INFTECH and SUPPORT job functions from 2013-2018. [18] There are 6,035 employees who are female in any of the three job functions, or are Asian or African American employees in PRODEV. This protected group of employees occupied 142 different standard job titles from 2013-2018 and worked in hundreds of different organizations on hundreds of different products.[19] Among this population OFCCP contends experienced discrimination from 2013-2018 (women in PRODEV, INFTECH, or SUPPORT; Asians and African-Americans in PRODEV only), 30.8% were identified in the data in any given year-end as Managers (i.e., had responsibility for supervising two or more employees) and 69.2% were identified as Individual Contributors (ICs).[20] Most (80.7%) of the ICs in the population OFCCP contends experienced discrimination reported to a manager also covered by OFCCP's claims.

38. Reflecting the wide range of roles these employees occupy, annual base salaries for full-time, full-year employees from 2013-2018 at HQCA ranged from [redacted]. However, a large part of compensation at Oracle—particularly for [redacted]

[18] 214 employees from data are excluded in this count because they start working in PRODEV, INFTECH, and SUPP job functions at HQCA after 1/1/2019. 86% of these employees work on a NetSuite product and moved from US-CA-San Mateo-2955 Campus Drive to HQCA on 1/3/2019 and 1/7/2019.

[19] https://www.oracle.com/products/oracle-a-z.html, accessed July 16, 2019.

[20] There are two main career paths for employees in these job functions at Oracle. Individual Contributors focus more on the technical aspects of products and services relative to Managers who oversee and coordinate projects. Each path is marked by Career Levels, with higher levels indicating increased scope and responsibility, but the two paths are not linked. For example, an IC2 is not the equivalent of an M2; an IC3 being promoted to manager would not automatically move into M4. It depends on the "scope and complexity of the position, and whether or not the employee has previous management experience." (ORACLE_HQCA_0000000407_Global Compensation Training - 2011 Managing Pay Final (Native).PPTX)

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employees—is comprised of bonus and equity awards.[21] Total annual compensation for these same employees thus ranged from [redacted].

39. Table 1 summarizes total compensation in 2014 for full-time, full-year employees aggregated up to job function. The first row indicates that there were 445 employees in the INFTECH job function, for whom the average total compensation was [redacted]. Imagine lining up these employees from lowest salary to highest. The lowest annual compensation was [redacted] and the highest was [redacted]. The median employee is in the middle – 50% of employees earned more and 50% earned less. Salaries in the PRODEV job function – where hundreds of hardware developers, software developers, and application developers work – earn [redacted] on average, but the range of total compensation spans from [redacted] In the smallest of the job functions, SUPPORT, compensation ranges from [redacted] to [redacted] with an average of [redacted].

The Distribution of Total Compensation in 2014 by Job Function

Job Function	N	Mean	Minimum	10th Percentile	50th Percentile	90th Percentile	Maximum
INFTECH	445	[redacted]					
PRODEV	3,833						
SUPPORT	219						

40. The range is from just [redacted] for each of the Job Functions, to [redacted] in INFTECH, [redacted] in PRODEV, and [redacted] in SUPPORT. These numbers include both the highest and lowest paid employees, but the range continues to be wide when ignoring these extreme values. The middle 80% of employees – those between the 10th and 90th percentiles in each job

[21] Total compensation equals base pay plus bonuses and stocks awarded that year. See US Manager's Orientation presentation dated December 6, 2016 (ORACLE_HQCA_0000042091_MASTER US Manager Orientation 1201 (Native).PPTX) which describes the components of compensation and divides it into base pay, short-term incentives (bonuses), and long-term incentives (stock options and restricted stock units).

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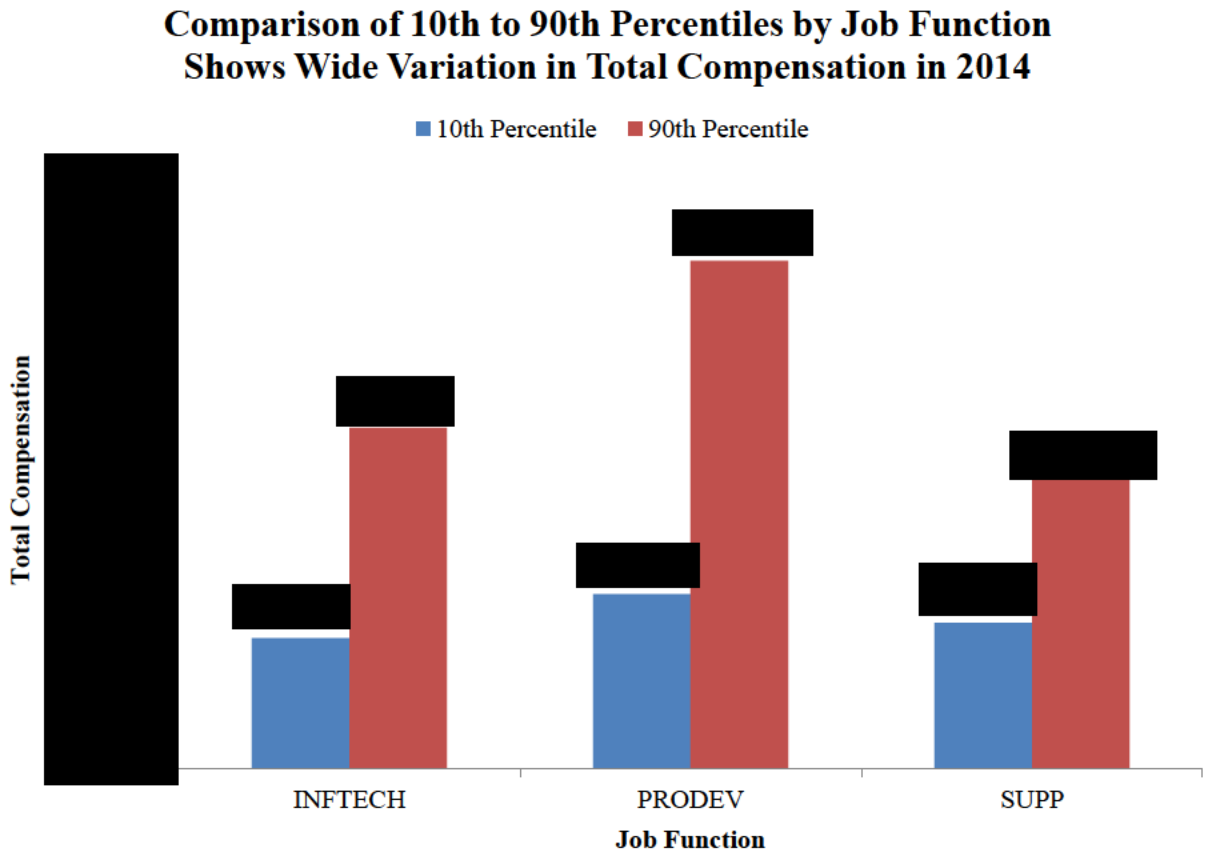
function - are shown below. Employees in INFTECH received between [redacted], while the corresponding ranges in PRODEV and SUPPORT were [redacted] respectively. These ranges are very substantial, even after eliminating the top and bottom 10% of employees.



Career paths at Oracle

41. Career Levels at Oracle reflect how the skills and scope of work increase with advancement within a given job family.[22] There are two Career Level tracks: "IC," indicating "individual contributor,"

[22] "The career levels are a standard set of broad, hierarchical categories related to the level at which a job is performed. The career level structure has two tracks: Management and Individual Contributor. Management is defined as one who is directly responsible for the practice or process of managing two or more employees (with hire/fire authority). Individual contributor is defined as a single incumbent with no management responsibility. In some cases, however, an individual contributor may operate as a team leader or manage one employee." (ORACLE_HQCA_0000022906 Career Level Guidelines Matrix

and "M," indicating "managerial." The Manager path is for employees who manage two or more people. Individual Contributors work on a technical expertise track and may supervise one employee. The table below comes from Oracle's internal documentation of the Individual Contributor track, and provides a high-level description of the general progression. It is my understanding that as one moves up the career path, the scope of work a given employee performs in his or her particular job family and role generally becomes more complex and the degree of autonomy increases, along with responsibility.

Individual Contributor Career Level Guidelines			
	Contribution	**Knowledge and Skills**	**Job Complexity/Scope**
IC1 - Learning	**Contributes through FOLLOWING DIRECTIONS: Activity with guidance and problem solving with assistance.**	Learns to use professional concepts. Applies company policies and procedures to resolve routine issues.	Works on problems of limited scope. Follows standard practices and procedures in analyzing situations or data from which answers can be readily obtained. Builds stable working relationships internally.
IC2 - Developing	**Contributes INDEPENDENTLY: Completes own role largely independently with some assistance and guidance.**	Developing professional expertise, applies company policies and procedures to resolve a variety of issues.	Works on problems of moderate scope where analysis of situations or data requires a review of a variety of factors. Exercises judgment within defined procedures and practices to determine appropriate action. Builds productive working relationships internally and externally.

Oracle.xls). Oracle also refers to these as a "knowledge leader (individual contributor role) or a "people leader" (manager role)." Oracle U.S. Employee Handbook, p. 43. (ORACLE_HQCA_0000000464)

IC3 - Career (Team Lead)	**Contributes through EXPERTISE: Duties and tasks are varied and are complex requiring independent judgment.**	A seasoned, experienced professional with a full understanding of area of specialization; resolves a wide range of issues in creative ways. This job is the fully qualified, career-oriented, journey-level position.	Works on problems of diverse scope where analysis of data requires evaluation of identifiable factors. Demonstrates good judgment in selecting methods and techniques for obtaining solutions. Networks with senior internal and external personnel in own area of expertise.
IC4 - Advanced (Mentor)	**Contributes through OTHERS: Leading contributor providing direction and mentoring to others.**	Having wide-ranging experience, uses professional concepts and company objectives to resolve complex issues in creative and effective ways. Some barriers to entry exist at this level (i.e., dept/peer review). Level at which career may plateau.	Works on complex issues where analysis of situations or data requires an in-depth evaluation of variable factors. Exercises judgment in selecting methods, techniques and evaluation criteria for obtaining results. Networks with key contacts outside own area of expertise.
IC5 - Guru (Internal Expert)	**Contributes through LEADERSHIP: Manages and plans implementation of company policy for achieving business goals.**	Having broad expertise or unique knowledge, uses skills to contribute to development of company objectives and principles and to achieve goals in creative and effective ways. Barriers to entry such as technical committee review exist at this level.	Works on significant and unique issues where analysis of situations or data requires an evaluation of intangibles. Exercises independent judgment in methods, techniques and evaluation criteria for obtaining results. Creates formal networks involving coordination among groups.

IC6 - Architect (Internal/External Expert)	**Contributes through STRATEGY: Develops and advises on company policy, contributing through strategy definition and implementation.**	As an expert in the field, uses professional concepts in developing resolution to critical issues and broad design matters. Significant barriers to entry (i.e., top management review, approval) exist at this level.	Works on issues that impact design/selling success or address future concepts, products or technologies. Creates formal networks with key decision makers and serves as external spokesperson for the organization.
Source: ORACLE_HeadquartersCA_0000022906 Career Level Guidelines Matrix Oracle.xls			

42. Looking at the boxplot charts for Career Level below, one sees very wide ranges of pay within each career level, and one also sees considerable pay overlap between the Career Levels. Boxplots work as follows: The average is indicated by the red diamond. The bottom of the blue box indicates the 10th percentile, the top of the blue box indicates the 90th percentile, and the line inside the box indicates the median or 50th percentile. The vertical lines extending beyond the boxes indicate the minimum and maximum compensation.

43. For example, Career Level IC4 has a total compensation range from [redacted] for full -time full-year employees at Headquarters during 2014. IC3 has a range of [redacted]. The 10th and 90th percentiles for IC3 are [redacted] respectively, which [redacted] As another example, in the M levels, a similar comparison of M3 and M4 also reveals [redacted]. In fact, for each adjacent pair of Career Levels in both the IC and M levels there is [redacted], with the exception of level M1, which has only 2 employees so that a range is not well defined. The chart summarizes the dollar figures in the table with vertical bars, and one can see that there is [redacted] The next chart summarizes the data for the 10th and the 90th percentiles, which reveals [redacted], indicating that there is a lot of flexibility for managers to make individualized pay decisions. The graph also reveals the wide range in total compensation within each of the career levels (with wider ranges at higher career

levels), again indicating that career levels in themselves span a broad range of employees whose pay may be differentiated by a host of factors related to the work they perform and their individual skills, abilities, and contribution.

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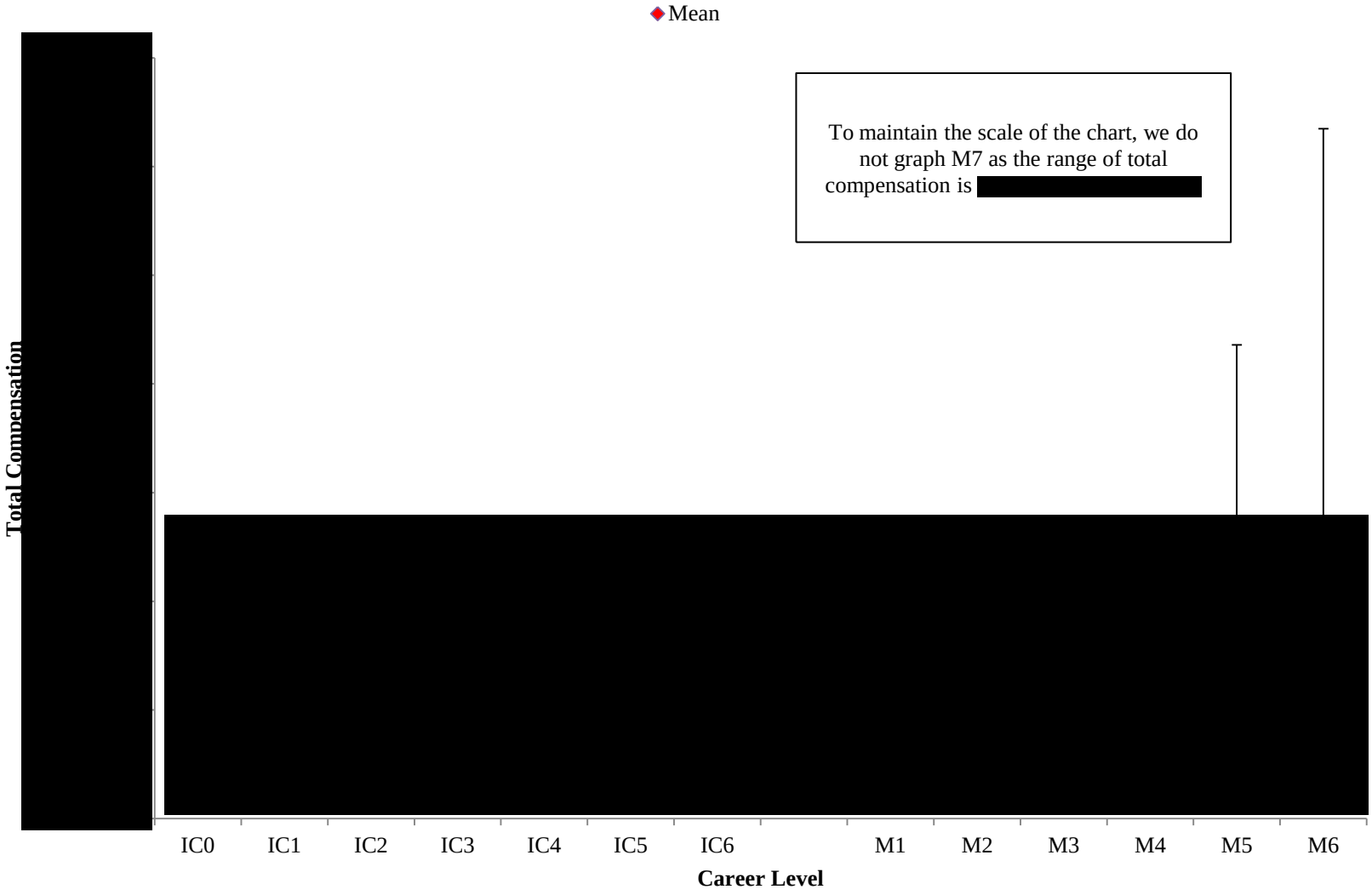
The Distribution of Total Compensation in 2014 By Career Level

- Full-Time, Full-Year Employees -



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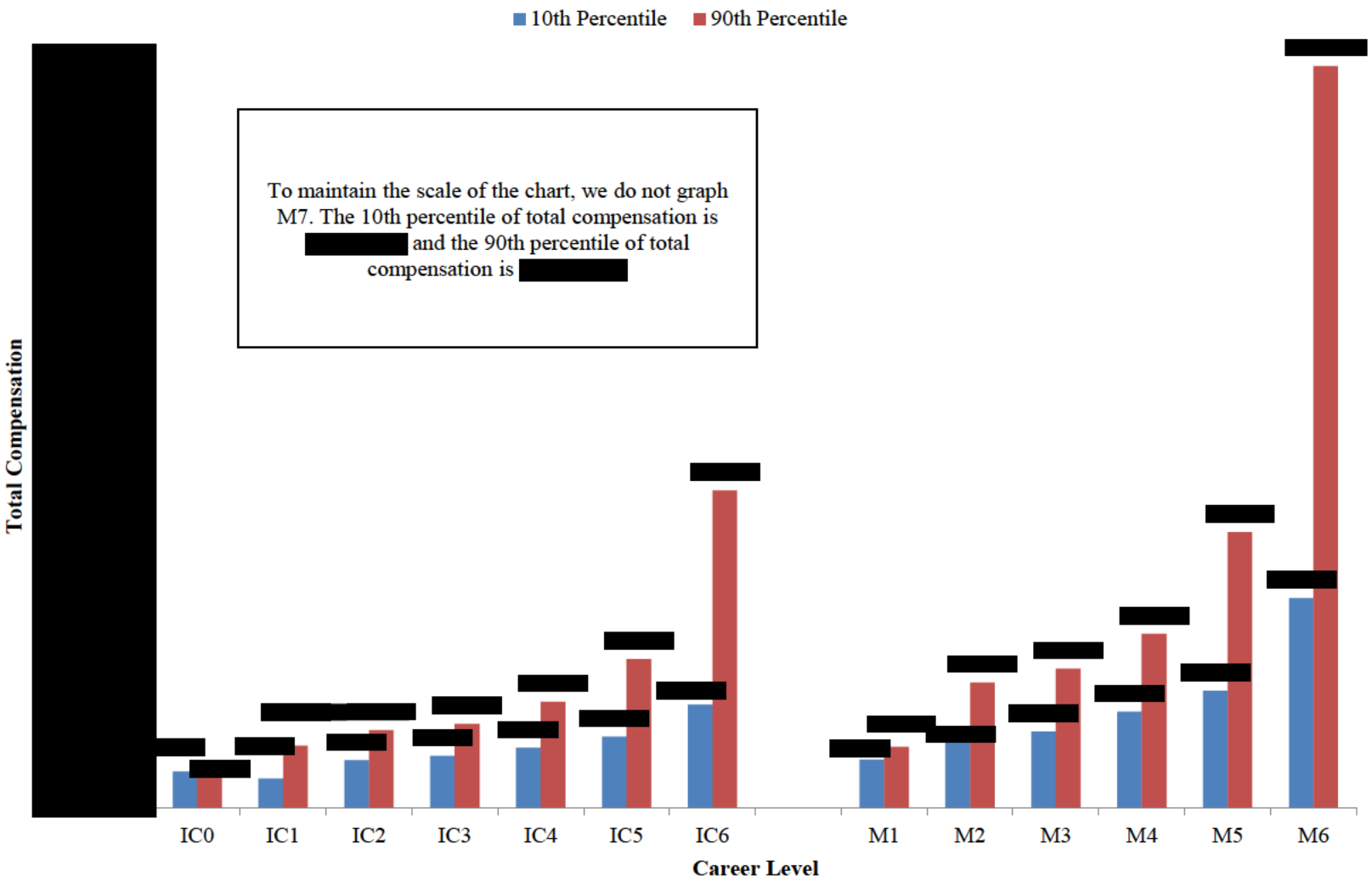
Comparison of 10th to 90th Percentiles by Career Level Shows Wide Variation in Total Compensation in 2014



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44. Not only does the pay range increase with Career Level but the base pay ranges are also quite wide in each level, with the maximum pay set about 80% higher than the minimum; this remains true even within the same job family. The table below for one job family – Software Developers (ranging from Software Developer 1s at the IC1 level to Software Developer 6s at the IC6 level) – shows for each hierarchical level the minimum, 25th percentile, midpoint, 75th percentile, and maximum base pay salaries in FY14. The salary range is purposely set wide to allow individual managers flexibility to differentiate pay. As Oracle documents make clear, "[s]alary ranges are a tool to assist managers in making decisions about pay. They provide managers with a range of pay that is considered fair and competitive in the local labor market for a specific job. Oracle's ranges are intentionally broad to allow managers to differentiate between employees who are new to their roles and still learning, and those who are fully qualified, very experienced and top performers."[23] The ranges also [redacted] such that a [redacted], for example, could be earning more than a [redacted], depending on the specifics of what they are working on and the labor market for the skills involved.

Base Salary Ranges Set by Oracle for FY14 at HQCA[24]

Standard Job Titles	Career Level	Minimum	25th Percentile	Midpoint	75th Percentile	Maximum
Software Developer 1	IC1	[redacted]				
Software Developer 2	IC2					
Software Developer 3	IC3					
Software Developer 4	IC4					
Software Developer 5	IC5					
Software Developer – Architect	IC6					

[23] ORACLE_HQCA_0000364272_native.pptx, p. 5.
[24] ORACLE_HQCA_0000581471_Salary_Range_History.xlsx.

45. This provides Oracle managers with flexibility to differentiate employees within a given standard job title. Employee compensation depends on the job and role being considered, on the employee's personal "skills, knowledge, and experience," "comparisons to others in the organization who have similar skill sets for the same role," "performance," "previous compa-ratio" and "tenure in current position."[25] The setting of pay also depends on fluctuations in how much competitors are paying people with similar skills in the dynamic labor market within which technology firms compete for talent.[26] Software Developers are not the only job that exhibits wide ranges of base pay at Oracle – all jobs above entry level that contain many employees that share a standard job title exhibit a similar pattern.

[25] ORACLE_HQCA_0000364272_native.pptx, p. 11.

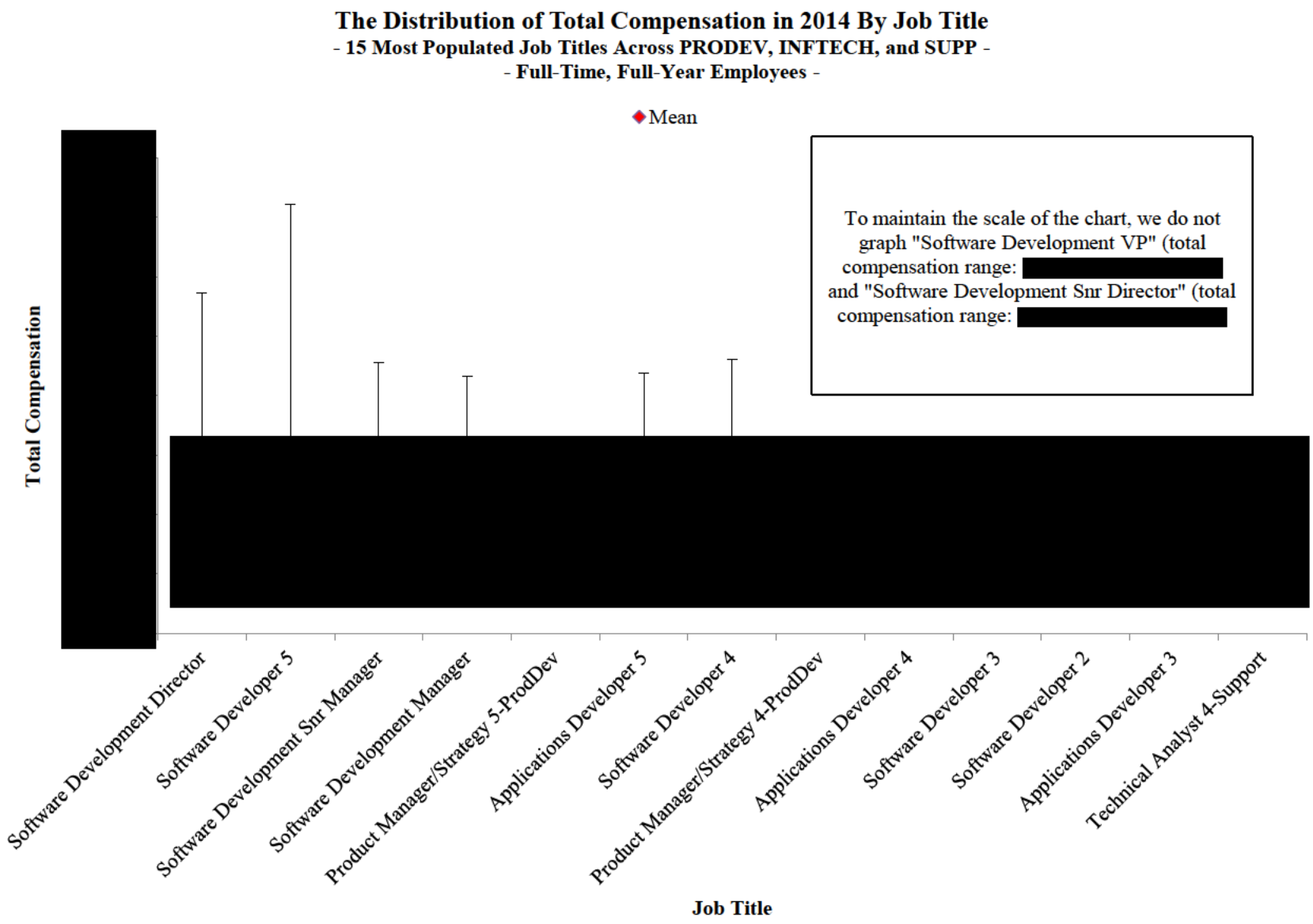
[26] See for example, iRec (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx) vacancies 3031613 ("competing offer from Google"), 3052439 ("competing offer from VMWare"), 2961610 ("His experience is most relevant for the security service we are building as part of Oracle Management Cloud and will be competing against Splunk.)", 2750313 ("Usability engineer for Service, Exty, and other projects. Competitive offer with CX start up"), 2896003 "has 4 yrs of automation/testing experience in UI,API. She has M.S in Software Engg. and Java expertise (OCJP).She has a pending offer with SAP", 2973701 "Competing offer: Synopsis $143.36K (128K+12%bonus) and $20K sign-on bonus)", 1723974 (" 8+ years deep exp. in DW/ETL/data modeling, critical to build a CX reporting infrastructure. Infosys competing job offer"), 2755591 ("This is an outstanding candidate who wants to join the team and we are competing against others offers").

Within standard job titles, total compensation varies widely

46. At Oracle total compensation can be and often is far higher than base pay alone. There were 137 different standard job titles held by full-time and full-year employees in the three job functions in 2014 at Headquarters. The graph below summarizes the total compensation measures for the 15 most populous of these standard job titles in PRODEV.[27] The most populous was Software Developer 4, with 611 employees in 2014. Software Developer 4 employees' total pay ranged from [redacted] in 2014, and looking at the graph, one can see that the middle 80% received between [redacted] For Software Developer 5 (the next largest group, with 375 employees) the overall range in total pay for 2014 was [redacted] and the middle 80% range was from [redacted] Once bonuses and stock awards are added to base salary, there is even more scope for managers to make pay decisions that distinguish between employees that share the same standard job title.[28]

[27] I focus on PRODEV because according to the claims as defined by the SAC, that job function covers all three demographic groups at issue (women, Asians, and African Americans).

[28] Employees sharing a job title sometimes have different "discretionary titles." These do not appear to have much power to distinguish employees by the kind of work they are doing, because within a standard job title, the vast majority share the same discretionary title.



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Requisitions for specific positions at Oracle demonstrate how skills and required experience differ within standard job titles

47. The wide variation in pay ranges associated with different standard job titles suggests, based on economic principles, that not all employees within a set standard job title are performing similar work. An evaluation of the available data and documents bear this out in the context of Oracle specifically.

48. The thousands of job requisitions produced in this case provide a significant amount of information regarding how the skills and specific prior experiences sought differ between jobs within broader standard job titles. Employees who have skills that are in high demand in Silicon Valley will command higher compensation than those with more readily available, less in demand skills.[29]

> "Especially when technologies are new, hands-on implementation experience is an important mechanism through which engineers learn about working with new technologies—for example, in the early days of the Internet boom, the expertise required to design and build a professional e-commerce site was acquired by working at one of a few prominent Web companies. As IT workers move between firms, some of this technical knowhow is transferred to new employers. The literature on IT workers has established the importance of external labor markets for employers needing to acquire technical skills […]."[30]

Based on the material provided during discovery in this case, skill sets among employees in this group do appear to differ in substantial ways, even within a single standard job title.

49. Requisitions for non-entry level job openings for Oracle typically contain detailed descriptions of what is being sought for a successful applicant. For example, Requisition IRC1771772[31] was opened for a Software Developer 4 to work with both traditional On Premise and Software as a Service ("SaaS") Fusion Applications customers (emphasis added):

> "**Fusion Applications Lifecycle Management: The team's initiative is to provide a comprehensive solution for managing customer customization and data from a customer Test to Production environment, for both traditional On-Premise and the SaaS Fusion Applications customers.** The challenge resides in establishing a deep understanding of the wide

[29] Miranda Declaration, paragraph 7. ORACLE_HQCA_0000607281.pdf. Economics literature confirms that IT companies are often willing to pay a premium for the knowledge new hires bring. See Tambe, Prasanna, and Lorin M. Hitt, (2013). "Job hopping, information technology spillovers, and productivity growth." *Management Science*, 60(2): 338-355.
[30] Tambe and Hitt (2013), p. 340.
[31] Taleo requisition (ORACLE_HQCA_0000070750_Requisition - Description and Qualification Data.xlsx).

> range of software components (e.g. WebLogic server, RDBMS server, Identity Management products) that Fusion Applications is built on, and produce a performant and robust solution that hides unnecessary complexities while still providing the level of flexibility required by customers. […] Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. **BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.** […] Qualifications we are looking for are: A Bachelor's Degree in the Computer Science or close-related Engineering major. Masters preferred. Excellent problem-solving and analytic abilities. **Fluency in the Java programming language. Experience in building enterprise applications on the J2EE platform. Knowledge of XML technologies. Knowledge of object-oriented design and implementation. Knowledge of one or more scripting languages (bash, perl, python, or ant). Knowledge of relational databases. Familiar with basic concepts such as tablespace and schemas. Experience with utilities such as RMAN or DataPump are a plus**."

50. The person hired to the specific job listed above, hired away from a senior software engineering position in a bank's hedge fund platform, has both a B.S. and M.S. in computer engineering, and an M.B.A.[32] Requisition 17000D7L also called for a Software Developer 4 but required "big data" skills (or the desire to learn more about big data efforts) and at least 5 years of experience. The position below requires knowledge of Hadoop, which I understand is a suite of technologies designed for large scale data storage, computing and processing (emphasis added):

> The Oracle Audience Data Marketplace is the world's largest B2B aggregation of third party data, and combined with the Oracle Data Management Platform (Oracle DMP), the Oracle Data Cloud team enables marketers a comprehensive and unified data management platform to drive prospecting at scale, audience insights and cross-channel marketing actions. **As part of our core Data Engineering team, you will contribute to our backend engineering platform(s) and be on the cutting edge of modern big data analytics and data streaming. This platform is the central core for processing data at high volume, high throughput, and low latency.** You are someone comfortable with the idea of embracing challenges dealing with terabytes of data on a daily basis and petabytes of data at-rest. **You are or want to become knowledgeable about building large-scale data processing systems, data warehouses, and the latest trends in big data techniques and technologies.** […] Candidates should have: - 5+ years in Java, C/C++, Python or Scala and a proficiency OO design and ETL (Extract, Transform, and Load) procedures and solutions - 5+ years developing and operating software in a Linux/UNIX environment (incl. working with Perl, Python, bash, or your favorite scripting language) - **Knowledge of Hadoop related technologies (MapReduce, YARN, HDFS, Pig, Hive, HBASE, Zookeeper, Cassandra, Mongo, Spark, etc.) - Knowledge of building and tuning probabilistic data structures - Knowledge of real time streaming frameworks and solutions, such as Kinesis or Kafka - Knowledge building and operating big data production solutions at scale -** Experience in Scrum/Agile methodologies - B.S. in Computer Science or a related field […]"

[32] ORACLE_HQCA_0000085621.doc

51. The person hired into this position also had an M.S. in computer science, but further possessed certificates in online courses in data science and machine learning, and held 5 patents, working as a Principal Software Engineer at eBay before joining Oracle's big data group. These two positions share the same standard job title, but differences in the skills required, the availability of those skills in a competitive job market, and the innovativeness or profitability of the products worked on appear to drive compensation differences. In fact, the second position [redacted].[33]

52. The background of another person hired as a Software Developer 4 in 2013 indicates that he functioned as a Senior I.T. Project Manager, not someone whose day-to-day requirements included coding. Their associated requisition even included a note about how very different and "unique" this person's role would be (emphasis added):[34]

> "**NOTE: the Job Title, Brief Posting Description, and Detailed Description in this iRecruitment app are somewhat misleading; this is a unique role that, while Development-related, is not directly involved in software coding or design. Corporate Architecture M&A Principal Manager: The Principal Manager will help the Oracle Corporate Architecture Group's M&A inbound analysis and integration team carry out Oracle's fast-paced corporate acquisition and integration strategy.** Specifically, the Principal Manager will act as a member of Oracle's M&A diligence virtual team, helping to coordinate the Corporate Architecture Group's work with virtual team members drawn from the company, as well as working to prioritize, plan, carry out, and track Corporate Architecture's M&A-related "due diligence" activities, including **the analysis of the third-party technology incorporated in the to-be-acquired products, integration planning work, and integration execution tracking**. While carrying out these responsibilities, the Principal Manager will interact with technical staff from Oracle Development, Oracle's Corporate Development (M&A) team, Oracle's M&A and IP attorneys, Oracle Support, Business Practices, as well as engineers and other staff from potential acquisition targets. This is an individual contributor role, at IC4 career level Oracle HQ location required."

53. A careful review of these position-specific postings indicates that the *combination* of standard job title and the particular nature of the work tasks specified better captures the type and level of work done

[33] These values have been converted to 2014 constant dollars.
[34] Person ID 892075880, iRec Vacancy IRC1981640 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

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and the particular skills involved than would standard job title alone.[35] For example, the Software Developer 4 above was hired into a mergers and acquisitions group, which distinguishes them from someone in the same standard job title working on a Cloud Storage products. Similarly, one of the Software Developer 4s described above was in a big data organization in the company, but a QA Analyst 4 position in the big data area in same Career Level nonetheless calls for different skills and [redacted]:[36]

> New Big Data development effort needs a strong QA engineer to help get it off the ground. It's the best of both worlds: a startup feel, but with enterprise backing and stability. Responsible for developing, applying and maintaining quality standards for company products with adherence to both internal and external standards. **Develops and executes software test plans. Analyzes and writes test standards and procedures. Maintains documentation of test results.** Analyzes test results and recommends corrective actions. As a member of the technical/process QA division, you will design functional, integration and regression test plans, build and execute manual and automated tests and perform highly complex analysis for multiple products. Set cross-functional product testing standards. Analyze, evaluate and plan methods of approach and organize means to achieve solutions to complex problems. Work is non-routine and very complex, involving the application of advanced technical/business skills in area of specialization. Leading contributor individually and as a team member, providing direction and mentoring to others. **BS or MS degree or equivalent experience relevant to functional area. 7 years of software engineering or related experience.** Duties and tasks are varied and complex, so you will need to exercise independent judgment and initiative. The work includes writing and executing test cases and test plans, focused on system- and integration- level testing for correctness, performance, and usability. There will be a large automated test component to the position, so you will be expected to write, execute, and maintain automated tests as well as manual ones. We're looking for someone who has experience in a project lead role and/or who has supervised lower-level test engineers. **Need to be proficient in Unix and Java. Test automation experience, preferably with JUnit, TestNG, Selenium, or similar technologies, is required. Familiarity with Big Data technologies is a strong plus.**

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[35] Kate Waggoner May 1, 2019 deposition, 90:12-21. In particular, her discussion of how pay is set: "[…] it's not just within that job code, but there are differences by the product you are working on […]." 90:18-20. By way of analogy, consider the "standard" job title of assistant professor at a large research university. There are assistant professors in every department, from the humanities, to social sciences, to business, law and medicine. Most people are familiar with the fact that those assistant professors in the humanities earn less than those in say, economics, engineering, law or medicine. This is true, holding constant years of experience, number of publications, service contributions, the rank of their department, and so on. In order to test if there is gender bias in pay, one would not control for rank alone, but for department as well. If there is a correlation between gender and department, omitting department would bias the findings relative to female pay.

[36] Vacancy ID 2489751 in IRec Data (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx), converted to 2014 constant dollars. Emphasis added.

54. The same variability is evident within other standard job titles as well. For Software Developer 3s, for example, the work is highly technical, based on the product or service around which the work is organized. The descriptions shown below indicate that these employees would not be suitable comparators in a pay analysis, given that some postings seek innovators with specialized knowledge and experience in SQL to prototype new software while others focus on ensuring that products are released to customers "bug-free."

Software Developer 3

Organization Name: **Database Research and Software Advanced Development, Oracle Labs**[37]

Department Description: The database research and advanced software development group in Oracle Labs is working on **incubating new technologies for Oracle software, and transferring leading edge research into products across a broad range of the Oracle technology stack. We are looking for experienced software engineers with MS/PhD in Computer Science** to join the Database Research and Advanced Software Development team. This is a great opportunity to **innovate and contribute to building next generation system** where the database is optimized to run on highly scalable, low power hardware architecture. This will enable analytic processing over several terabyte datastore in sub second.

Required Skills: Programming of database internals using C/C++ programming language to drive SQL processes. Experience with in-memory, columnar and SQL internals Experience writing code on top of low arm processors Experience with SQL query optimization, query execution and data access will be very desirable **Previous experience in an R & D organization prototyping new products and technology for commercial software Master's and PhD in Computer Science highly desired**

Software Developer 3

Organization Name: **Fusion Middleware** [38]

Department Description: Oracle Fusion Middleware is the foundation for thousands of software applications developed around the world. We are creating new components and capabilities tailored to give Fusion Applications a competitive edge in the applications marketplace. Our Fusion Application components are extensions to Oracle's J2EE Application Development Framework (ADF) and are created using Java and XML. We take advantage of the latest Web technologies including AJAX, Flash, and Java Server Faces (JSF). We offer the richest Web UI experience possible and provide a huge development productivity edge over our competitors by greatly simplifying the application development process. The Oracle Fusion Middleware Team is looking

[37] IRec data. (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx) Vacancy ID 1535737. Emphasis added.
[38] IRec data. (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx) Vacancy ID 1689521. Emphasis added.

for Information Technology Specialists and Quality Assurance Engineers interested in building the next generation of world class application development tools. **We are looking for highly motivated individuals who will ensure our products are delivered on time with zero defects. If you have experience coordinating release schedules, implementing product builds, creating product installs, and testing mission critical software releases** then you need to get us your resume today. As a member of the Fusion Middleware Release and Operations Team **you will learn how to integrate a variety of Oracle technologies** including ADF/JSF, BPEL/SOA, WebLogic Server, WebCenter/Portals, Document Management/UCM, Internet Directory etc. If you're a problem solver and you're looking for a new set of challenges in an environment that rewards innovation then we want to talk to you.

Required Skills: **BS or MS degree or equivalent experience relevant to functional area. 4 years of software engineering or related experience**. Job Responsibilities: 1. Develop automated tools to efficiently and **reliably build and test** Oracle Fusion Middleware product releases 2. **Implement installation scripts and procedures** for Fusion Middleware components 3. Create **installation scripts** for Fusion Middleware database objects 4. **Coordinate internal uptake of new versions of Oracle technologies** including RDBMS, ADF/JSF, BPEL/SOA, Internet Directory, etc. 5. **Create and test product updates / patches** for critical customer issues 6. Support uptake of Fusion Middleware releases by Oracle internal development teams 7. Setup and maintain databases for development, QA, install testing, etc. 8. Create and maintain WebLogic Service templates for various releases. Job Experience:1. 2+ years of experience in product release management 2. 2+ years of experience using a scripting language like Perl, Python, Borne/C/Korn Shell Programming 3. DBA experience using Oracle RDBMS 4. Experience using source control systems 5. Knowledge of WebLogic Server (WLS) a plus

The person hired for the Middleware position started at [redacted] and described himself as a "Build and Release Engineer" holding a Bachelor of Engineering in Computers.[39] The Oracle Labs hire, whose starting pay was [redacted] held a Ph.D. in Computer science and sought a position in "research on exascale query processing and cloud computing."[40] Even though they share a standard job title, the content of the work they do and the skills they draw upon are quite different, in ways that impact their pay.

<u>A statistical cluster analysis indicates that controlling only for standard job title and not more detailed aspects of work does not group employees doing substantially similar work</u>

55. In order to further explore how job content varies within a standard job title, Oracle's new hire requisitions were analyzed to understand whether there are systematic textually identifiable differences in

[39] ORACLE_HQCA_0000084860.doc. Starting pay converted to $2014.
[40] ORACLE_HQCA_0000084213.pdf. Starting pay converted to $2014.

job requirements even holding job title constant.[41] In Attachment E, I present this research in more detail, but several studies have used clustering algorithms to extract separate subsets of skill requirements from the text of undifferentiated job requisitions, with a particular emphasis on identifying the specific skills required for different types of IT jobs that share the same job category on job posting sites.[42] Much of this research stems from a need to identify high demand skills in the face of rapid change in the types of skills required by IT jobs. Economists also have a long history of utilizing coded text data in their analyses, including converting detailed paper hardcopy job descriptions into standardized occupations and industries that can be analyzed quantitatively.. Following techniques used in this research area (and described in more detail in the Attachment), I use these methods to analyze the 521 detailed text job requisitions for the largest standard job title in the data, Software Developer 4. Ultimately the algorithm clusters similar requisitions into groups that are most similar based on the specific terms contained in the descriptions. The analysis applied to the Software Developer 4 requisitions resulted in the creation of 24 unique clusters.

56. I present "word clouds" that visually depict the importance of each word, where importance is measured using word frequency within and across documents calculated by the clustering technique.[43] Less frequent words may appear larger if the algorithm determines they are more important. The word clouds for all 24 clusters of requisitions for Software Developer 4s are in the Appendix but I will discuss two clusters here as examples. Each word cloud below presents the 50 most important words per cluster, with the most important terms being presented in large blue or purple font, and the less important terms being presented in small red font. When visually comparing the word clouds, it is evident that there are distinct differences in the importance of terms that appear in each of the clusters.

[41] The requisition data contains information relating to job listings and included generic company information, as well as detailed text that described the specific job requirements. The generic text was not analyzed, as there is no variation to study. Rather, the job specific detailed text was analyzed for this analysis.

[42] Woweczko, Izabella A. (2015) Skills and Vacancy Analysis with Data Mining Techniques, *Informatics*, 2: 31-49; Litecky, Chuck, et al. (January/February 2010), "Mining for Computing Jobs," *IEEE Software*.

[43] For the purpose of presenting terms or words in a word cloud, important terms are identified by the algorithmic process as those with the highest proportion in a cluster minus their proportion across all clusters.

57. The word cloud below is based on the 10 requisitions in Cluster 13, which has an average starting salary of [redacted]. The term with the greatest weight that appears in Cluster 13 is "test," which suggests that this cluster of requisitions relates to testing applications that are developed by others. Closer manual inspection of the text in the qualifications section of these requisitions supports this finding. As just one example, a portion of the responsibilities section Closer manual inspection of the text in the qualifications section of the requisitions supports this finding. As just one example, a portion of the responsibilities section of requisition IRC2797620 in Cluster 13 states:

> "As fusion apps system testing team, we are responsible for fusion apps SAAS setups OVM, high availability, enterprise manager, enterprise deployment, and lifecycle testing, which includes • design, implement, and execute test cases based on design specifications • develop automation framework in java for web 2.0 applications • develop programs in java to automate test cases • execute, debug, and fix automated test suites • report bugs and track for a resolution • work with global development teams to build testing solutions and troubleshoot issues in order to deliver product in high quality."[44]

58. The average starting salary of Cluster 2 is higher, at [redacted]. The chart above shows that the incidence of terms for Cluster 2 is different than those that appear in Cluster 13. The highest weighted term in Cluster 2 is "exadata," with "database" and "storage" also being common terms. The prominent

[44] IRec data. (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

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terms that appear in Cluster 2 indicate that this group of requisitions is associated with developing Oracle's Exadata database machine. For example, an excerpt of requisition IRC2189577 in Cluster 2 states:

> "As a member of the sustaining engineering database team, specializing in the future technology of engineered system, you will articulate, manage, integrate and test critical security and database fixes for Exadata engineered systems. You will work at the forefront of defining the future direction of releases, by being responsible for articulating all necessary security and other critical fixes from across the Exadata stack which includes Linux, storage, networking and database components, and finally, integrating, testing and filtering out the critical and important content by working in close collaboration with various technical teams across the organization and Linux community."

59. The cluster analysis is consistent with the idea that controlling only for standard job title and not more detailed aspects of work does not group employees doing substantially similar work from a labor economics perspective. As a result, if women or Asians happen to be distributed across these clusters differently than white men – for example, women were 20.0% of new hires in Cluster 13 and 7.7% of new hires in Cluster 2 – then not accounting for within-job title differences in skills and responsibilities will lead to omitted variable bias. The inference is that standard job title alone does not similarly situate employees.

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60. Because the level of position-specific detail varies significantly across requisitions, the clustering technique – while instructive – cannot be applied uniformly across all of the data. For example, Oracle Labs is a research and development organization of the company, where cutting edge work is performed according to requisition descriptions.[45] Some of the requisitions contain no detail on Oracle Labs, and clustering techniques would not be able to distinguish these postings from others in Oracle Labs that described it in much more detail:

> "**The Mission of Oracle Labs is straightforward: Identify, explore, and transfer new technologies that have the potential to substantially improve Oracle's business. Oracle's commitment to R&D is a driving factor in the development of technologies that have kept Oracle at the forefront of the computer industry. Although many of Oracle's leading-edge technologies originate in its product development organizations, Oracle Labs is the sole organization at Oracle that is devoted exclusively to research.** The acquisition of Sun Microsystems, along with dozens of other acquired companies, brought a wide array of technologies to Oracle's portfolio. Oracle executives recognized that in Sun Microsystems Laboratories, Sun brought the combined company the benefits of an independent research organization - now renamed Oracle Labs. Expertise in building and maintaining compilers and high performance runtime systems."

Nonetheless, the clusters confirm what reading the requisition text suggests, which is the content of work is not fully or accurately captured by standard job titles.

61. Moreover, if men and women or Asians and Whites are distributed differently on average across the kinds of work being done within a standard job title, using only that title as a control in a regression model leads to omitted variable bias, because the work of Software Developer 4s (for example) can differ tremendously and these differences may correlate to gender and/or race. Again, "discrimination" can only be *inferred* based on the magnitude and statistical significance of a variable placed into the regression model to identify a protected trait like gender or race. But if the model is mis-specified, and other variables are poorly constructed, then the conclusions drawn from the sign and statistical significance of the gender or race variable are unreliable.

[45] See, for example, Vacancy ID 2481627 (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx).

IMPLICATIONS OF THE RANGE OF EMPLOYEES AND WORK ROLES FOR THE STATISTICAL ANALYSIS

62. Basic economic principles state the high likelihood that someone being paid $48,000 is doing different work than someone being paid $600,000 regardless of the fact that they share a job function. For example, any manager even vaguely attentive to cost-effectiveness issues and bottom-line profitability will not pay someone $600,000 to do work that can be procured for $48,000. Conversely, someone who could command $600,000 for his or her work is unlikely to remain at an employer who pays only $48,000. The analytical question is determining what factors an analyst has to take into account in order to construct groups for analysis who ultimately are similarly situated by the analysis from a labor economics perspective, by which I mean that their skills and responsibilities are sufficiently similar once all appropriate variables are examined and taken into account.

Not all models are equally reliable for statistical inference

63. A regression model is a method for averaging over a dataset to understand the relationships between variables. In order to assess whether this summarizing exercise is useful or not for understanding the data, it is important to examine the underlying data and not just the regression model results.

64. For example, there are thousands of persons who have been hired over the course of the data provided in this case. The largest number of these hires is to the standard job title Software Developer 4. Two things in the data are notable about these hires. First, starting pay can differ substantially, even though they are hired into the same "standard job title." The job descriptions from the requisitions discussed above indicate reasons this may be the case, such as the extent to which the job requires innovative skills in newly developing technologies.

65. Second, if you plot the age of these hires versus the pay they receive, there is virtually no relationship. In typical jobs at many companies and industries one would expect a positive upward sloping relationship, such that those at higher ages earn more due presumably to their greater labor market

experience.[46] But you do not see that pattern in the Oracle data – for example, for Software Developer 4s who are newly hired from the external labor market – indicating that some of these hires at young ages appear to be earning high pay based not on years of work experience but instead on some particular skill or ability they have. One might also expect roughly similar ages among new hires in a single standard job title, if that job title were closely related to the nature and value of the work these hires were brought on to do. However, new hires to Oracle, even limited to Software Developer 4 positions, range in age from 25 to 62. The fact that both 25 and 62 year old workers are hired into Software Developer 4 positions indicates two possible things – (1) that employees are hired into these roles at a certain level within a job family based on the skills they possess (rather than just the years they have worked), and (2) as noted above, the Software Developer 4 standard job title is not accurately or narrowly measuring work content.

66. The latter implication is important to interpretation of a measured pay difference between protected and non-protected employees. If for example men who apply are more likely to possess "hot skills" than female applicants, simply due to the characteristic of the labor market or who happens to apply to Oracle, using standard job title alone without some measure of the kind of work they do or product they work on, will instead inappropriately attribute some of that impact of having or not having "hot skills" to gender.

67. Modeling experience correctly for the Oracle employees in the job functions that OFCCP has sought to study is no simple task. To briefly review what a regression model does, consider the relationship between salary and company tenure: in many jobs, the longer an employee is at a company, the more they earn. This could be because the company uses a seniority system with lockstep pay increases over time, or it could be that as employees gain valuable on-the-job skills and experience, their pay increases as the value of their work increases.

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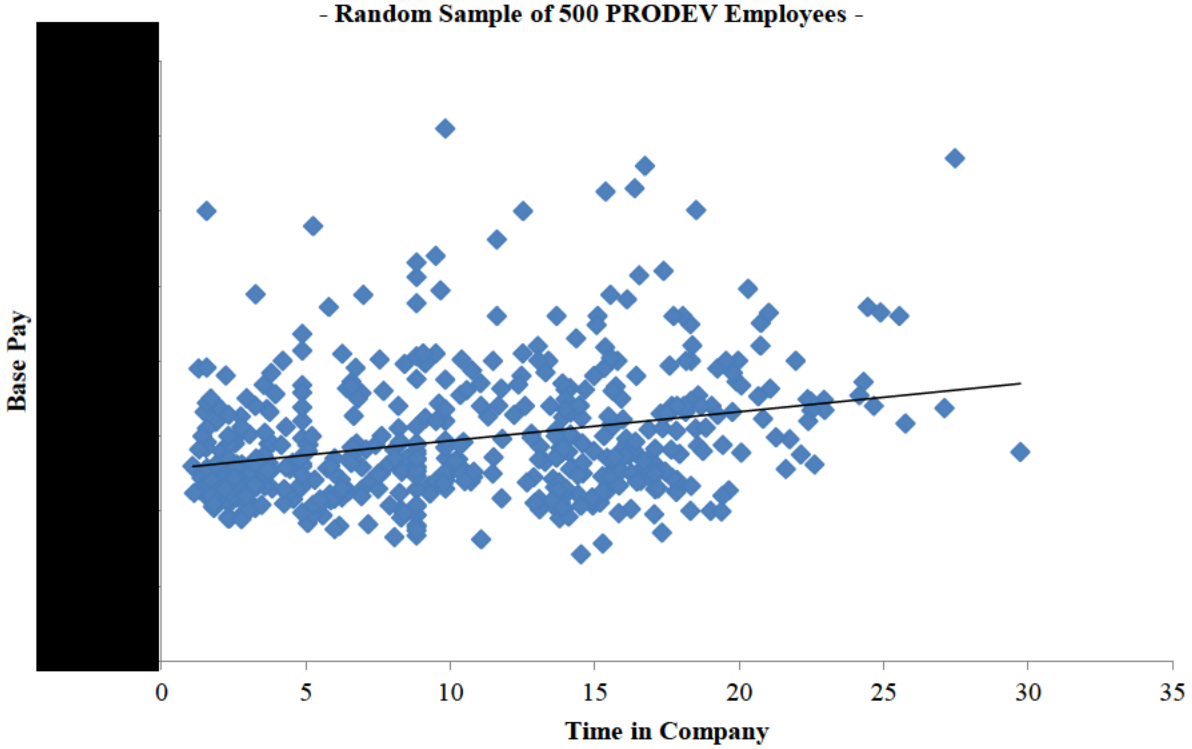
[46] This has a longstanding and prominent research area in labor economics for decades. See for example, Becker, Gary S. "Investment in human capital: A theoretical analysis." *Journal of Political Economy* 70.5, Part 2 (1962): 9-49; Mincer, Jacob. "On-the-job training: Costs, returns, and some implications." *Journal of Political Economy* 70.5, Part 2 (1962): 50-79; Ehrenberg, Ronald G., & Smith, Robert S. (2015). *Modern Labor Economics: Theory and Public Policy*. Twelfth Edition.

68. The scatterplot below depicts the relationship between base salary and tenure for a random sample of full-time Oracle employees in the PRODEV job function. The vertical axis is base pay, the horizontal axis is time at the company, and each dot represents an employee's combination of pay and tenure. As the scatterplot and its fit or trendline shows, there is a very slight positive relationship on average between tenure and salary for these employees.[47] In a company in which pay increased in lockstep with tenure, this upward sloping relationship would be more pronounced with observations tending to cluster at low tenure, low pay and at higher tenure, higher pay.

There is a Slight Positive Relationship Between Company Tenure and Base Salary for PRODEV Employees
- Full Time, Full Year Employees in 2014 -
- Random Sample of 500 PRODEV Employees -



[47] The trendline is a regression line where the dependent variable is earnings and the independent variable is tenure. In this example I use a simple linear relationship between earnings and tenure for illustrative purposes only. When modeling pay more fully, the appropriate method is generally to use the natural log of pay, and to incorporate the ability to capture a non-linear pattern between earnings and tenure.

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69. Looking at the trendline, at zero years of tenure (new hires) the line "predicts" pay is about [redacted].[48] At 20 years of tenure, the (regression) line predicts pay is about [redacted].[49] In effect, the line depicts average pay for the employees who share a tenure level.[50] If one were to draw a line up from the horizontal axis at about 10 years of tenure to where it intersects the trendline, it shows that employees with 10 years of tenure are predicted to earn about [redacted] on average. Now, for the employee dots near the trendline, that prediction is fairly accurate. There are a number of employee dots with 10 years of tenure which are far from the trendline, both much higher and much lower pay than predicted, meaning that the trendline does not accurately predict their pay. For example, the highest paid employee with 10 years of tenure earns almost [redacted], and the lowest paid employee with 10 years of tenure earns about [redacted]. The trendline predicts pay, and tenure might even be a statistically significant predictor of pay, but the prediction is quite inaccurate for a number of employees.[51]

70. The large prediction errors for employees, also known as the "residuals," between actual pay and predicted pay based on this simple two-variable model suggest that the model is inadequate. Textbooks

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[48] This is a simple linear trendline, for illustrative purposes.

[49] I use the word "predict" not necessarily in any causal sense, but simply that the model, when applied to the data used will "fit" each combination of pay and tenure average in a particular way. I used the term "fitted values" interchangeably with "predicted."

[50] "The key idea behind regression analysis is the statistical dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables. The objective of such analysis is to estimate and/or predict the mean or average value of the dependent variables on the basis of the known or fixed values of the explanatory variables." Gujarati, Damodar N. (1988) *Basic Econometrics*, Second Edition. New York: McGraw-Hill, Inc., pp. 23-24. For a more thorough discussion of regression, there are many econometric textbooks that describe the methodology in great detail. See, for example, Greene, William (1993) *Econometric Analysis*, 2nd Edition, NY: Macmillan Publishing Company.

[51] R-squared is a quantitative measure of how well the regression model fits the data. A model that explains none of the variation in the dependent variable has an R-squared of 0; a model which perfectly predicts the variation in the dependent variable has an R-squared of 1. (Gujarati (1988), p. 67). Here, the R-squared obtained by regressing pay on tenure is 0.08, indicating that just 8% of the variation in pay is explained by tenure at Oracle. Whether a particular R-squared is high or low depends on the data being analyzed. In time series data, R-squared tends to be quite high. An R-squared of 0.9 in a time series might be considered low. In Census data or in other one-time cross-section surveys collected across a broad swath of the population, an R-squared of 0.3 might be considered reasonably high. Data collected in a single company provides a great deal of detail about employees, unlike widely accessible databases like the Census which collects data on non-workers, pilots, teachers, janitors and entertainers, among others. One therefore expects much higher R-squared results in single company data.

recommend examining the residuals as a way to diagnose potential problems with the model.[52] There might be additional variables that need to be included to explain pay, such as years and types of work experience before joining Oracle, or standard job title. It could also be the case that the model is flawed because it is combining very different kinds of employees into a single analysis without distinguishing them. For example, there may be a subset of employees who work in "cutting-edge research" areas in which tenure is of less importance than possessing a set of relatively rare specialized skills.[53] Another subset of employees might be working on legacy products that are being maintained but not substantially redesigned, in which case years at Oracle might be a highly relevant factor for pay.

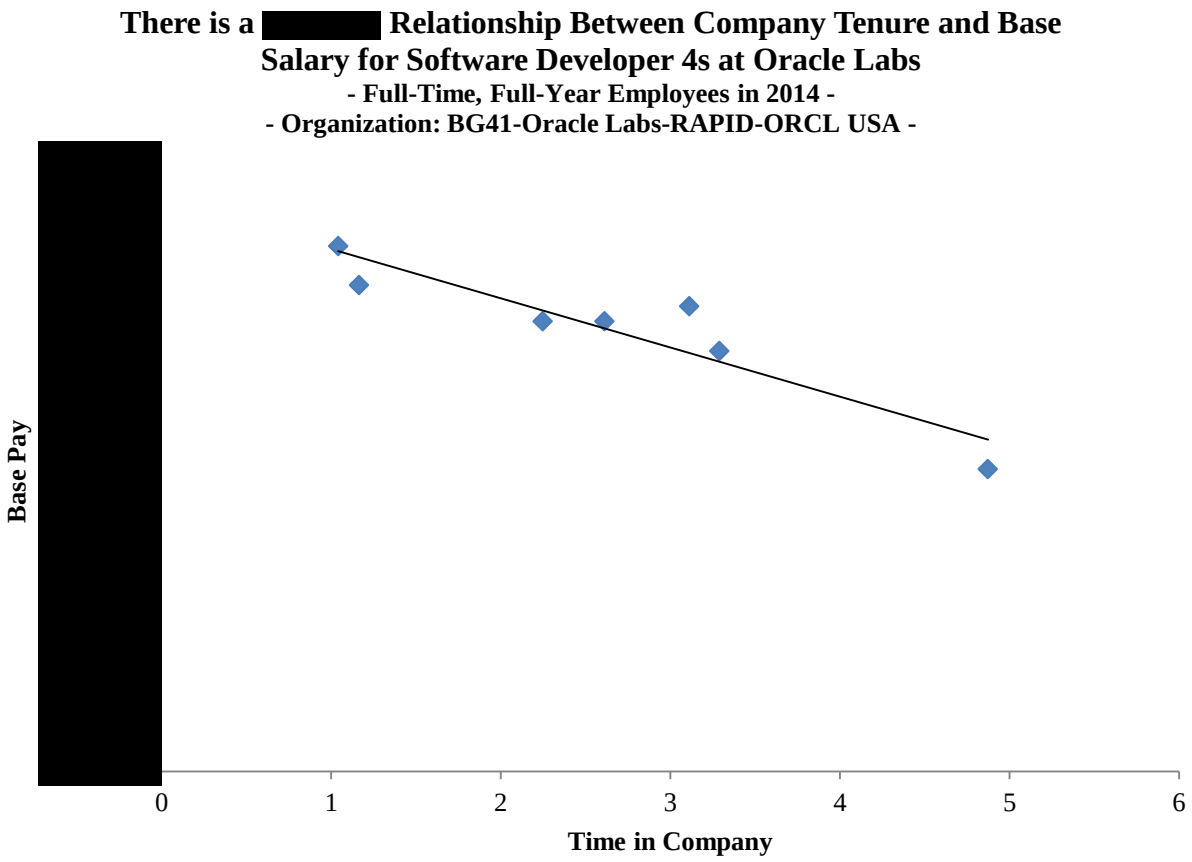
71. The two graphs below show how tenure and pay are related for Software Developer 4s in 2014. The first graph for developers in the Oracle Labs organization, which focuses on cutting edge research.[54] No employee has more than 5 years of tenure at Oracle, and the [redacted]

[redacted]

[52] Analysis of residuals is common in econometrics. The regression model is estimated on data containing the actual data for each observation. The regression coefficients and an individual's values for each of the control variables are used to estimate a predicted value for each observation. The difference between the actual value and the predicted value is called the residual. The computer programs that estimate regression models choose the coefficients that minimize the sum of the squared residuals, i.e., the distances between the actual and predicted values. See Gujarati (1988) *Basic Econometrics*, or any basic econometrics textbook.

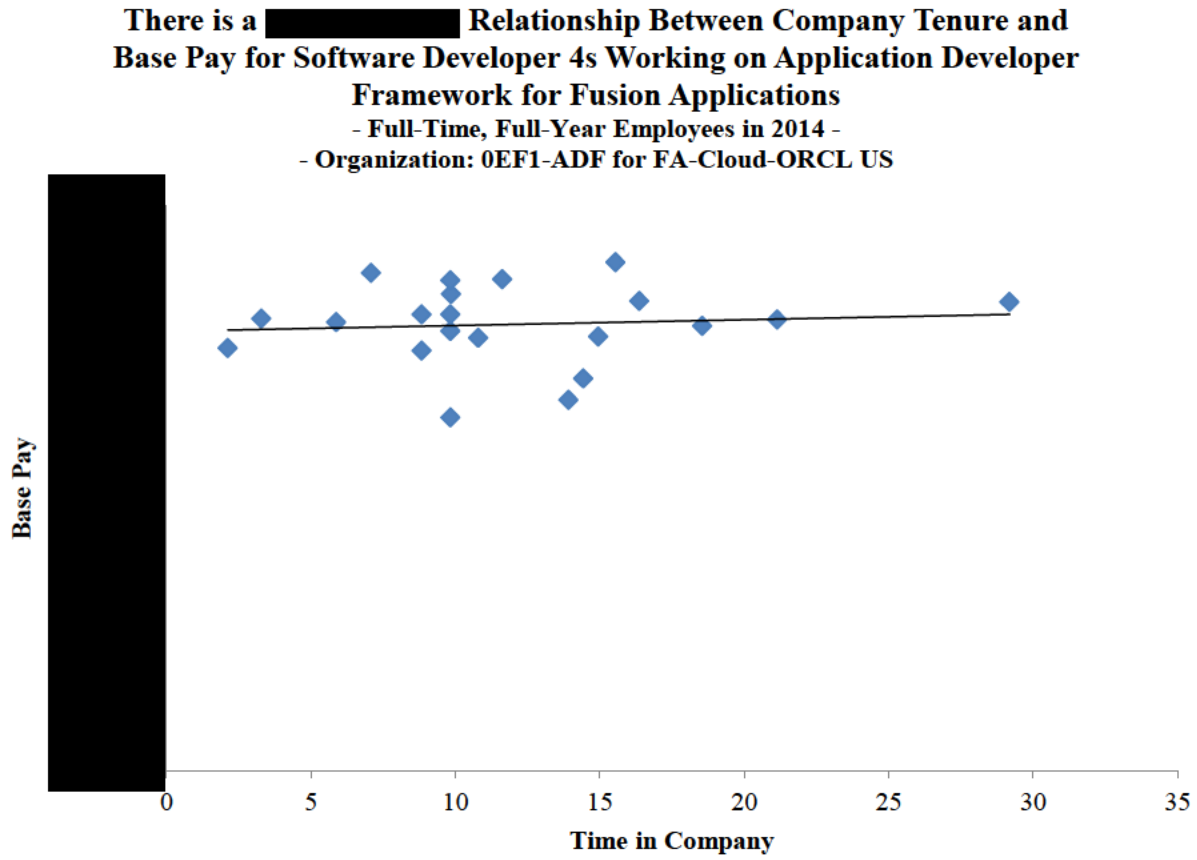
[53] "Because not all products and services have the same value to Oracle, the value of the skills, duties, and responsibilities necessary to develop, enhance, or service Oracle's wide array of products and services also differs and changes over time. For example, (and there are plenty more, twenty years ago, employees skilled in Siebel technologies were highly sought after in the marketplace. Today, by contrast, there is high demand for (and comparatively limited supply of) employees with experience specifically in cloud-based technologies and artificial intelligence. As technology continually changes and develops, the competition and market demand for employees skilled in the latest technologies also changes, meaning the value to Oracle of various skills, duties and knowledge also fluctuates over time." Miranda Declaration, paragraph 7. ORACLE_HQCA_0000607281.pdf)

[54] According to Oracle's web site, "Oracle Labs researchers look for novel approaches and methodologies, often taking on projects with high risk or uncertainty, or that are difficult to tackle within a product-development organization. Oracle Labs research is focused on real-world outcomes: our researchers aim to develop technologies that will someday play a significant role in the evolution of technology and society." (https://labs.oracle.com/pls/apex/f?p=LABS:ABOUT:0, accessed on June 27, 2019.)



72. The next graph is for the Software Developer 4s working on the Application Developer Framework for Fusion Applications, which according to the Oracle web site has been around in some form since the early 2000s.[55] Employees in this organization have worked at Oracle for as long as 30 years. Among these employees, the relationship between tenure and pay is small but positive.

[55] See https://www.oracle.com/technetwork/developer-tools/jdev/jdev-history-099970.html. Accessed on June 27, 2019.



73. The first graph I presented for pay and tenure aggregated all PRODEV employees into one graph with one best fit line to predict their pay based on tenure. The variation (or residual) between actual and predicted pay is much less in the graphs that take standard job title and organization into account. It is good econometric practice to assess a model's usefulness by examining residuals visually and not simply to rely on whether coefficients are statistically significant or the R-squared is high. [56]

74. Graphs like these inform my opinion that the analyses presented by OFCCP were not performed correctly, in that they leave out a number of important pay-related factors and aggregate over employees

[56] "[…] [E]xamination of the residuals is a good visual diagnostic to detect autocorrelation or heteroscedasticity. But these residuals can also be examined, especially in cross-section data, for model specification errors, such as omission of an important variable or incorrect functional form." Gujarati (1988), p. 407. "R-squared is sensitive to the range of variation of the dependent variable, so that comparisons of R-squareds must be undertaken with care…R-squared is also sensitive to the range of variation of the independent variable, basically because a wider range of the independent variables will cause a wider range of the dependent variable and so affected R-squared as described above." Kennedy, Peter. (2008) *A guide to econometrics*. Malden, MA: Blackwell, p. 27.

who are far too diverse for the model they use. By failing to take products and services worked on – and the skills required to perform that specific work – into account, the OFCCP model essentially aggregates all of the employees in a given job function for analysis, and averages all of these tenure patterns into a single number with respect to tenure. This number does not then reflect a causal relationship between tenure and pay, but an unknown mixture of both causal forces and aggregation-caused outcomes. Instead, the regression model is simply summarizing the average fitted relationship between pay and tenure across employees in many different parts of the company, some of which reward long tenure and some which do not, mostly likely because the kinds of skills they demand and how those skills are acquired differ in substantive ways.[57]

75. This concern applies to other variables in the model. The regression model's results for gender or race are also an average, just as tenure was above. Although the regression model summarizes the relationship of pay and gender into a single number, some women receive less than men and some much more. The same is true for race. The scatterplots depict so much variation in outcomes across individuals relative to what the OFCCP regression line predicts that I conclude that the OFCCP model is not adequately modeling compensation at Oracle and thus is unreliable for drawing conclusions about total compensation and gender or race at Oracle.

<u>If important variables are left out of the model that are correlated with the variable of interest in the model, the regression results are tainted by omitted variable bias</u>

76. In real world data, it is not the case that the analyst knows a priori which independent variables are the ones that should be included in a regression model. For example, in the simple best fit or trendline example above, there is no control for relevant work experience prior to Oracle. The measured effect of tenure is thus muddied because there may be employees who are new to Oracle but who have decades of relevant experience elsewhere that are not in the model.

[57] "Although regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causation. In the words of Kendall and Stuart: 'A statistical relationship, however strong and suggestive, can never establish a causal connexion: our ideas of causation must come from outside statistics, ultimately from some theory or other.'" Gujarati (1988*) Basic Econometrics*, p. 18.

77. In the context of using regression methods to study a gender or race discrimination pay claim, there is a particular problem that the statistician must deal with. If there is a variable that does in fact relate to pay and is left out of the model – i.e., it is "omitted" – then the question is how this affects the magnitudes of the other coefficients in the model. It turns out that many explanatory variables are correlated to each other, such that omitting a variable from a regression, or including it when it was previously omitted will change the value of the coefficients on other variables. For example, if women had more work experience than men on average, and you omitted work experience, the measured effect on pay of being female would be biased by that omission. In other words, the coefficient on female will measure both the impact of being female as well as the fact that some of the impact of female is actually due to their greater amount of work experience. Where the true effect should be spread over two variables, it is included only in one of those variables, distorting the measure from that one variable and of course attributing nothing to the omitted variable. This is what is called "omitted variable bias." This is a persistent issue in multiple regression analysis in the real world, where it can be difficult to know what factors matter, and difficult to obtain accurate measures for variables you know are important.

78. In this case the OFCCP attempts to use regression methods to compare men and women or Asians, African-Americans and Whites who they claim are performing substantially similar work, and to then test to see if women or Asians are paid differently than men or Whites. They control for standard job title, but as shown above, even within a given standard job title, the range of pay (and of skills and abilities) is considerable. If Oracle's "standard job titles" are overly broad, such that they include many types and levels of work, use of these job titles with no further refinement can lead to misleading and biased conclusions regarding pay for women and minorities.

<u>Analyzing residuals is a useful way to examine how varied the data is and thus how well the regression model predicts pay</u>

79. As noted above, a regression analysis produces a set of averaged outcomes for any data set it is performed on. Yet the average may do a poor job of describing the specific individuals in the analysis.

We can use the regression to inspect the nature of the variation "under the hood" of the averaged regression results, however. In order to examine the variation around the averaged regression outcome, we can use the commonly derived set of average impact regression coefficients together with each employee's individual values for the model's variables. Because the regression coefficients estimated on the entire set of employees considered are common, they represent the average impact across all these employees, and thus there is one set of regression coefficients that is applied to each employee in the data to compute each individual employee's predicted or "regression-expected" pay. We compute the pay the model predicts for each employee, and compare that predicted pay to their actual pay. If the model is well specified, meaning we have captured most or all important factors that impact pay and we have measured them correctly, the model should predict within some reasonable range what an employee actually earned. If we have left out variables, or measured them poorly, we will not get a good set of predictions, and there could be wide discrepancies for substantial numbers of employees between the actual and predicted pay. The issue is whether those discrepancies are systematic, and the model has omitted an important factor. This "in-sample prediction," or analysis of residuals, is a common way to assess the quality of a regression model.

80. There are statistical techniques to test whether an individual's actual pay and predicted pay are statistically significantly different. But it is also the analyst's responsibility from an economic perspective to assess the actual width, not just the "statistical width" of the confidence interval. All confidence intervals based on the normal distribution will have 95% of the values in the distribution within two standard deviations of the mean. Thus every distribution shares the same "statistical width" when reduced to statements of the observations that are within two standard deviations of the mean. However, some distributions are tall and narrow, meaning that these 95% of all observations are relatively tightly bunched, and other distributions are wide and flat, meaning that the observations that are within the 95% confidence interval are widely dispersed. A prediction that has a confidence interval of plus or minus 10% of the value of the mean is *economically* different than a prediction which has a confidence interval of plus or minus 40% of the mean. Both statements have the identical 95% of all

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possibilities within the stated interval, but the quantitative range these intervals cover is quite different. For example, a predicted value of $125,000 plus or minus 10% ranges from $112,500 to $137,500. A predicted value of $125,000 plus or minus 40% ranges from $75,000 to $175,000.

81. When analyzing these residuals, some women or minorities will in fact have been paid less than a regression model predicts based on their non-gender, non-race characteristics such as estimated prior experience and standard job title (as will some male and white employees).. Some women or minorities will be paid about what the model predicts, and some will earn more than the model predicts based on their individual characteristics. This is not surprising in any regression model. Again it must be emphasized that the issue is by how much the predictions vary when compared to actual pay. An average always *can* be estimated; that in and of itself does not mean it is necessarily the best or even a good summary statistic to describe the data. A sink with separate hot and cold taps will produce warm water on average, but neither tap is accurately described as providing warm water. In a regression context, this means that the determination of what the important factors to hold constant other than gender or race are a crucial component to the interpretability of a coefficient. A pay regression is only an average and does not in and of itself answer the question of whether, from a statistical perspective, the circumstances of pay outcomes of female employees at Oracle are amenable to common analytical treatment.

<u>Oracle's complexity makes model assessment that much more important</u>

82. As I described above, Oracle is a large Fortune 100 company that offers a wide array of complex technological products produced by software developers, hardware developers, tech writers, project managers and other specialized employees. Base salaries for full time, full year employees range from [redacted], and once bonuses and stocks are included, total compensation ranges from [redacted]. Even within a standard job title, educational requirements vary depending on the project from those needing a college degree through others requiring a Master's or a Ph.D. The requisite knowledge base differs as well. Some of the position-specific requisitions for Software Developer 4 describe working on building statistics modules for an analytics platform using their Master's in Statistics

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and programming in C and C++,[58] while others indicate the need for a B.A., M.A. or Ph.D. in computer science to perform work creating "enterprise applications used by customers to design and execute cross channel marketing campaigns."[59] Nothing in the materials I have reviewed suggests that these skills sets are interchangeable. Yet a simple variable for the standard job title Software Developer 4 would imply these employees *are* fungible.If the model is truly holding skills and responsibilities constant in order to compare similarly situated employees, it should include variables to capture those skills. If the way pay is set and administered is different for college hires than for those employees joining through a posted requisition for a specific position, then aggregating over the two hiring paths is not appropriate. Again, a model is always to some extent a simplification, a representation of a more complicated reality. Whether it is a useful model depends on the strength of its simplifying assumptions about what is important to include in the analysis.

Scatterplots show that the OFCCP model does not fit the data well

83. As noted, a regression coefficient is an *average* effect, a single number that summarizes the average relationship between two variables (such as compensation and gender) holding other factors constant (such as tenure). The question is how well that single number or average summarizes the many data points being averaged. In this section, I use the OFCCP's data and variables to gauge how well the relationship between pay and race or gender is summarized into a single number. One way to examine this variability is to study employees' actual earnings relative to what the OFCCP model predicts for each person. The statistical software itself essentially automatically predicts pay for everyone in the data as part of its calculations that generate the regression results. It is a simple matter to modify the OFCCP computer code to retain and view each employee's predicted pay.

84. I made one other adjustment to the OFCCP model, to remove the gender and race variables from the model that predicts pay. The idea here is to predict pay based only on job and employee characteristics *other than gender or race:* What would an employee earn regardless of gender and race

[58] Requisition Vacancy IRC1505775. (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx)
[59] Requisition Vacancy IRC2499832. (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx)

based on their characteristics? Thus, I re-estimated the OFCCP's regression models each year, dropping gender and race as control variables, and then examined each person's actual and predicted pay.[60]

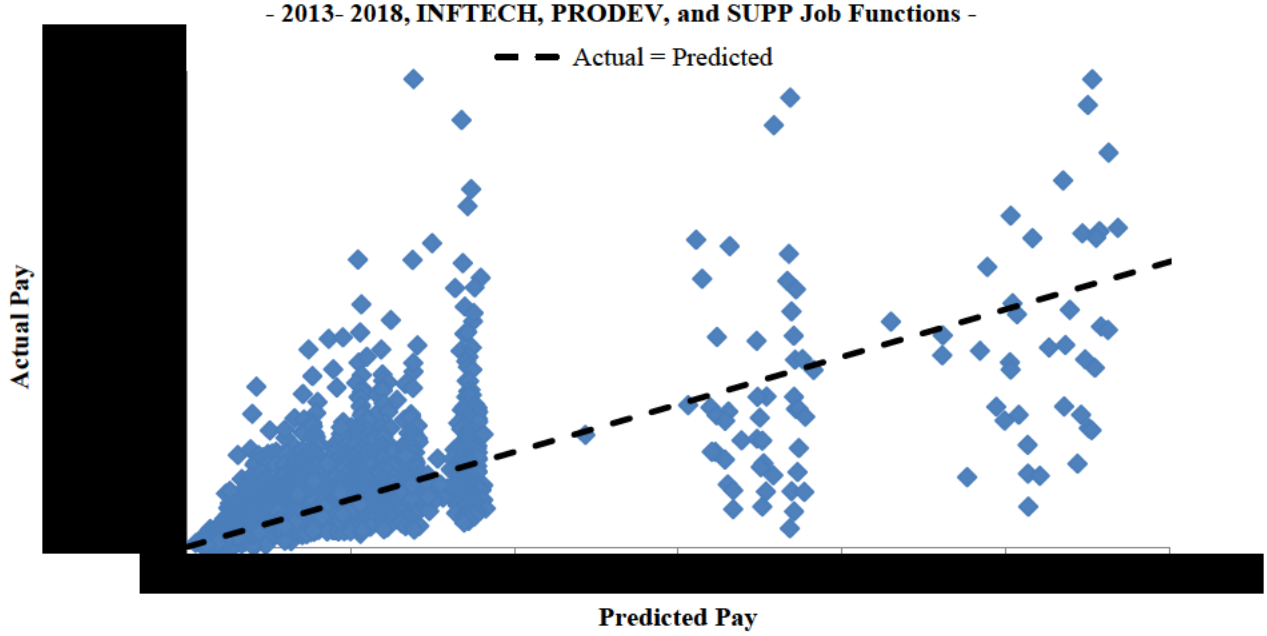
85. The graph below plots actual total compensation for each employee on the vertical axis and what their predicted compensation would be based on the non-gender, non-race variables in the OFCCP analysis on the horizontal axis. I have restricted this to employees whose actual pay is under [redacted] because otherwise much of the data points are compressed into the lower left corner. Each dot in the graph indicates a person-year in the data. The dashed line indicates where actual pay equals predicted pay. Dots above the dashed line indicate employees who are paid more than the OFCCP model predicts; dots below the line indicate employees who are paid less than his model predicts. By design, because regression models estimate the average effect, roughly half of all the points should be scattered randomly above the line and half below.

[60] I here use OFCCP's method of calculating total compensation – though I later explain in detail why such a method is wrong – because the objective here is to examine how well OFCCP's own approach fits the data regarding actual Oracle employees.

The OFCCP's Regression Model Cannot Explain Wide Pay Differences in Employees it Considers Similar: Actual vs. Predicted Total Compensation (Medicare Wages)

- Prediction Based on OFCCP Model, Without a Gender Control -

- 2013- 2018, INFTECH, PRODEV, and SUPP Job Functions -



Not shown: 21 observations [redacted]
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

86. The first thing to leap out of the scatterplot is that many observations are clustered in the bottom left of the graph, even after restricting the population to those earnings under [redacted]. The reason for this is there are quite a few observations whose actual pay is vastly higher than their predicted pay.[61] The OFCCP regression model cannot explain wide pay differences in employees it considers similar. For example, take the point along the horizontal axis at [redacted], which is where predicted pay equals [redacted] If one were to draw a straight line vertically from that point upwards, it would intersect with a dot for an employee below the dashed line indicating someone whose actual pay was below the predicted amount of [redacted]. If one were to continue that same line up from [redacted] and intersect it with an employee dot above the dashed line, that is someone whose actual pay was higher than the predicted [redacted] Both of those dots represent employees who based on their observable

[61] For example, one employee was predicted to earn [redacted] actually earned [redacted]. Another was predicted to earn [redacted] but actually earned [redacted]

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characteristics, were predicted by the OFCCP model to be paid [redacted] but one is paid more than the expected [redacted] and the other employee is paid less.

87. There are 13 observations whose predicted pay is between [redacted]. Their actual pay, however, ranges from [redacted]. This wide variation in actual pay between employees that the model considers roughly similar is unexplained by the regression model, because the model makes the same average prediction for all of them. There are several explanations for why the model is that far off explaining pay at Oracle. First, the OFCCP mis-measured total compensation by including portions earned by exercising stock options from previous years. Second, the control variables used in the model do not similarly situate employees and hence do a poor job at explaining pay generally. Third, the single regression model is applied to an employee population that is far too diverse.

The scatterplot below shows the same information as the graph above but it is restricted to full-time Software Developer 4s in order to drill down on the largest standard job title in the data. It shows women as blue diamonds and men as green hatches. All full time Software Developer 4s are predicted by the OFCCP model to earn between [redacted]. Their actual pay ranges from [redacted] to over [redacted] The highest earning Software Developer 4 according to the OFCCP data is a woman who, in 2016, exercised stock options she received years earlier, between 2000 and 2007. The OFCCP measurement of total compensation does not reflect work she performed in 2016 but rather her decision to cash in stock options. The second lowest earning female Software Developer 4 earned just under [redacted] due to her having been on unpaid leave from [redacted] through [redacted]. Because the OFCCP model does not take leaves of absence into account, their model interprets her as being underpaid relative to her prediction. The lowest earning Software Developer 4 earned just over [redacted], for reasons that are unclear in the data, as his annual base pay at Oracle was [redacted] at the end of 2013 and Regular Earnings (recorded in the same dataset where Medicare wages are found) were over [redacted] for 2013.

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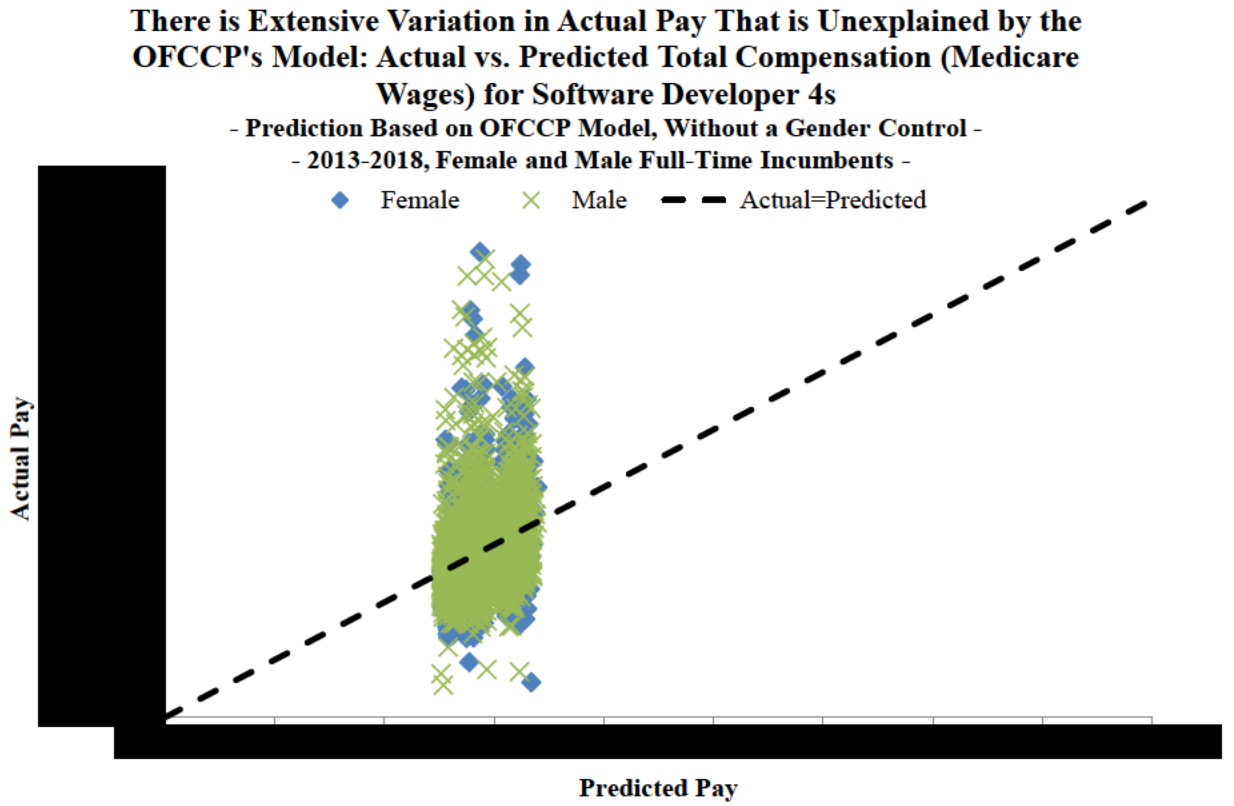
.[62] The OFCCP measurement of total compensation does not account for all the wages she was paid in the year.



Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

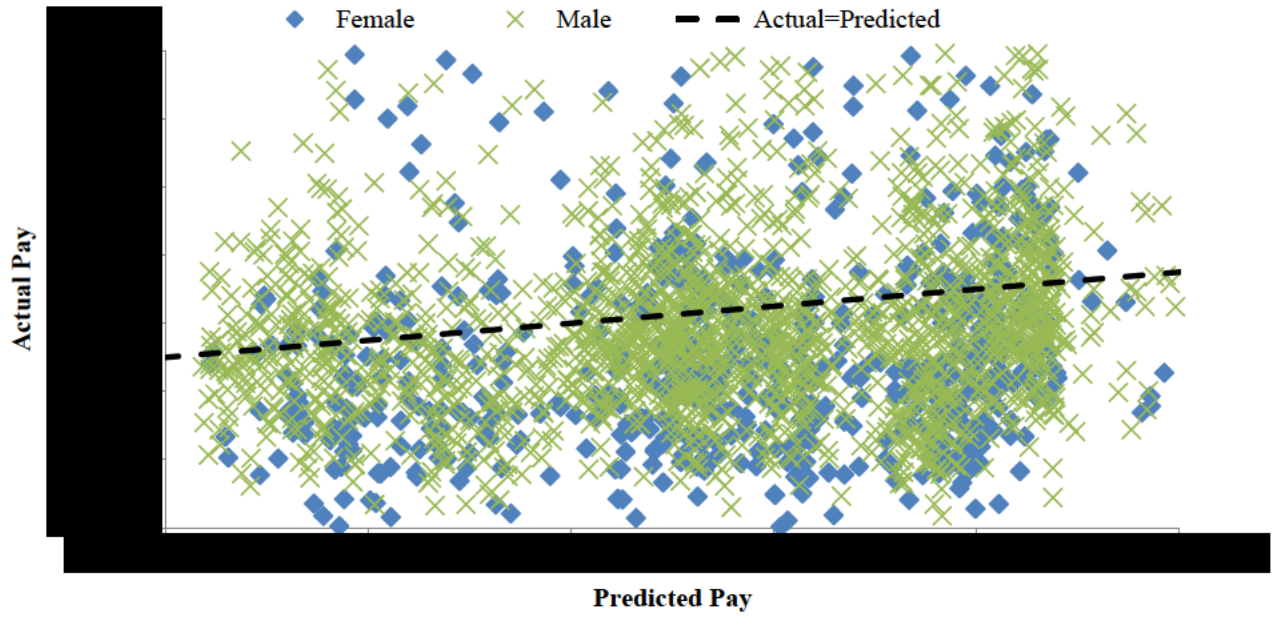
88. The chart above shows how narrow the predicted pay band is [redacted] relative to actual pay [redacted]. Even zooming in to the part of the chart where actual pay is between [redacted] as shown in the chart below, the extensive variation in actual pay that is unexplained by the OFCCP model's prediction is evident.

[62] Person ID 893560722.

There is Extensive Variation in Actual Pay That is Unexplained by the OFCCP's Model: Actual vs. Predicted Total Compensation (Medicare Wages) for Software Developer 4s: Closeup

- Prediction Based on OFCCP Model, Without a Gender Control -

- 2013-2018, Female and Male Full-Time Incumbents -



Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

89. The OFCCP model cannot explain why some female Software Developer 4s earn so much more than predicted and some earn so much less. Employee 105257 (an Asian woman) was predicted to earn [redacted] but actually earned [redacted] in the "Transaction/Data/Space" organization. She has been at Oracle for 18.6 years, of which 14.3 have been as a Software Developer 4. Employee 116276 (also an Asian woman) was predicted by the model to earn about the same amount [redacted] but she actually earned [redacted] in the "Public Cloud Platform Development" organization. She too worked for Oracle for 18.3 years but has only been a Software Developer 4 for 0.9 years. The OFCCP's model would attribute the gap between her actual and predicted pay as evidence of discrimination against women, but that model does not take organization or time in standard job title into account, and it cannot explain why the other woman earned so much more than predicted.

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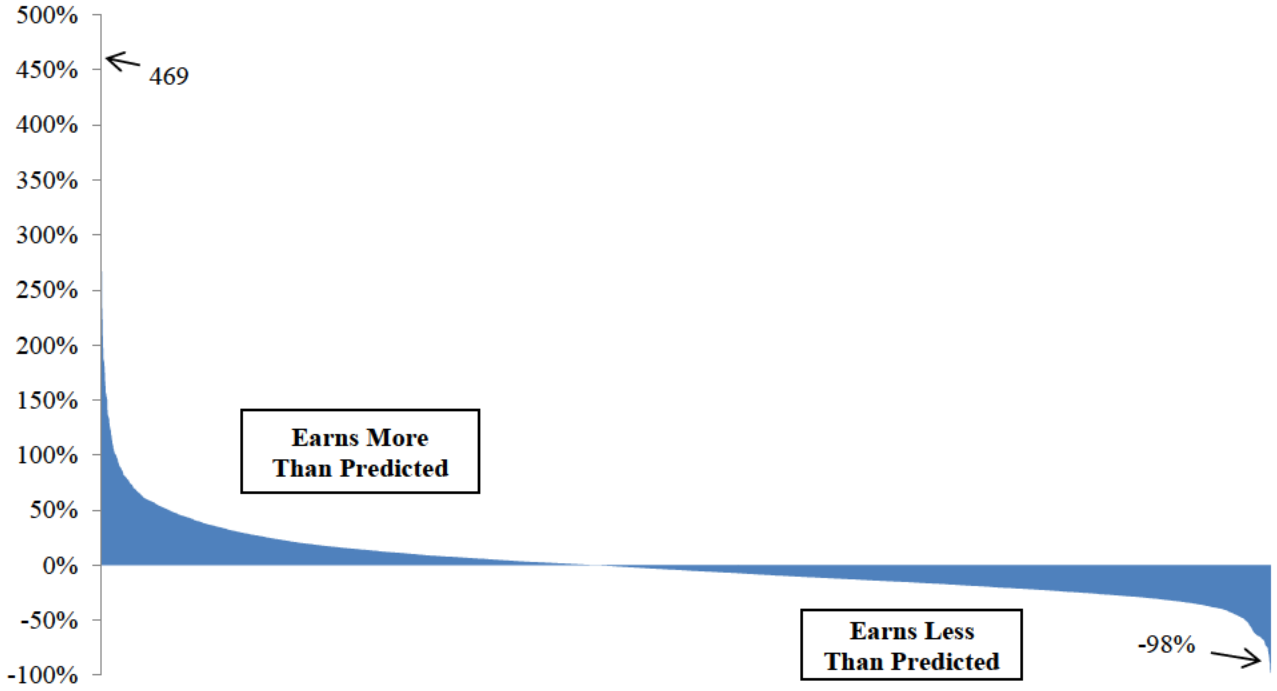
90. The next graph shows the same information for female employees but portrays it somewhat differently. As before, an employee whose actual pay is greater than her predicted pay is plotted above the horizontal axis and an employee whose actual pay is less than her predicted pay is plotted below the axis. The height of the bar measures for each female employee, the percentage by which actual pay differs from predicted pay.[63] Employee outcomes are sorted from highest to lowest. If most or all women were adversely affected by Oracle's pay policies and practices, they would largely appear below the horizontal zero axis – i.e., their percentages would be negative when comparing actual to predicted "should have been paid" pay. The graph shows that, even using the OFCCP model, 43% of women are not systematically adversely situated relative to men; the point at which the bars flip from positive to negative is near the middle of the graph, not over toward the left. That the height of the bars ranges from positive 469% to negative 98% shows that a one-size-fits-all regression model is likely inappropriate. A single regression coefficient on gender is a summary measure that masks a great deal of variation in what the OFCCP claims supports its contention that there is a pattern or practice of pay discrimination against women.

[63] This is calculated as (exp(residual)-1)*100.

There is Wide Variation in the Percent Difference Between Actual and Predicted Total Compensation (Medicare Wages) for Women
- Prediction Based on OFCCP Model, Without a Gender Control -
-2013 - 2018, Female Incumbents in INFTECH, PRODEV, and SUPP Job Functions -



Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

91. The graph for Asians is quite similar, with the gap between actual and predicted pay ranging between positive 656% and negative 97%. Almost 48% of Asians earn more than the OFCCP model predicts. The OFCCP uses its model to argue that all Asians in PRODEV are underpaid and owed damages but looking under the hood, so to speak, the model is not a solid basis upon which to draw such a conclusion.

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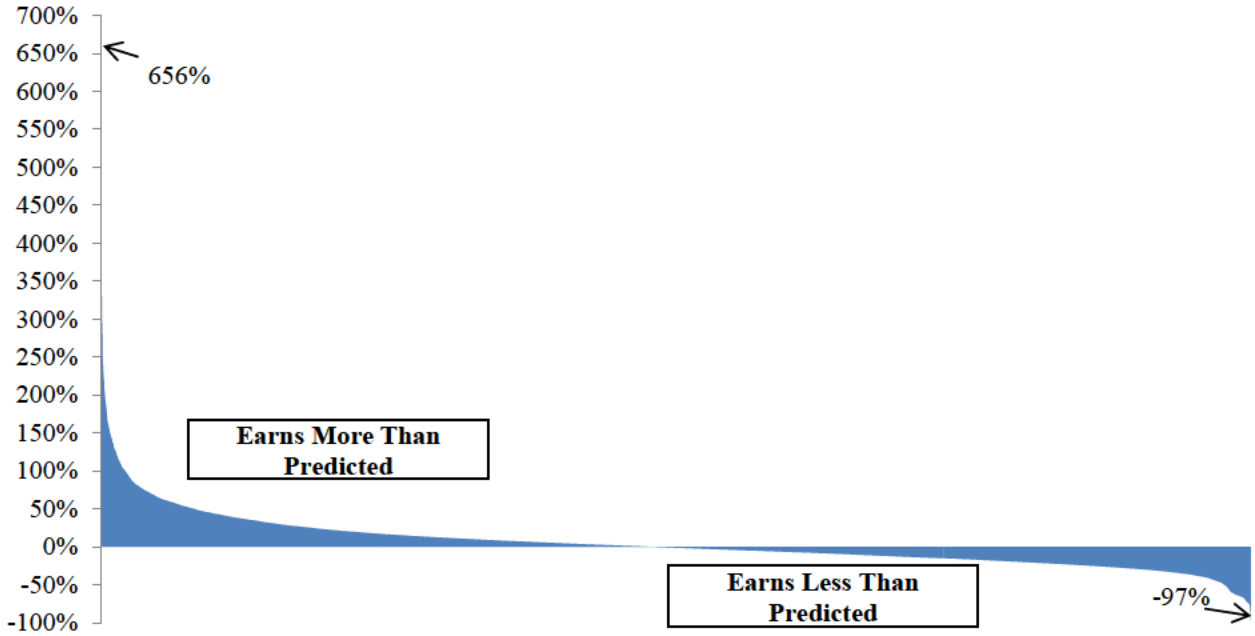
There is Wide Variation in the Percent Difference Between Actual and Predicted Total Compensation (Medicare Wages) for Asians
- Prediction Based on OFCCP Model, Without a Race Control -
- 2013-2018, Asian Incumbents in PRODEV Job Function -



Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

92. A very similar pattern is evident for African-Americans, with the gap between actual and predicted pay ranging between positive 705% and negative 46%. The OFCCP estimates damages for African-Americans assuming all are underpaid but this graph shows how that is not the case even according to their own model.

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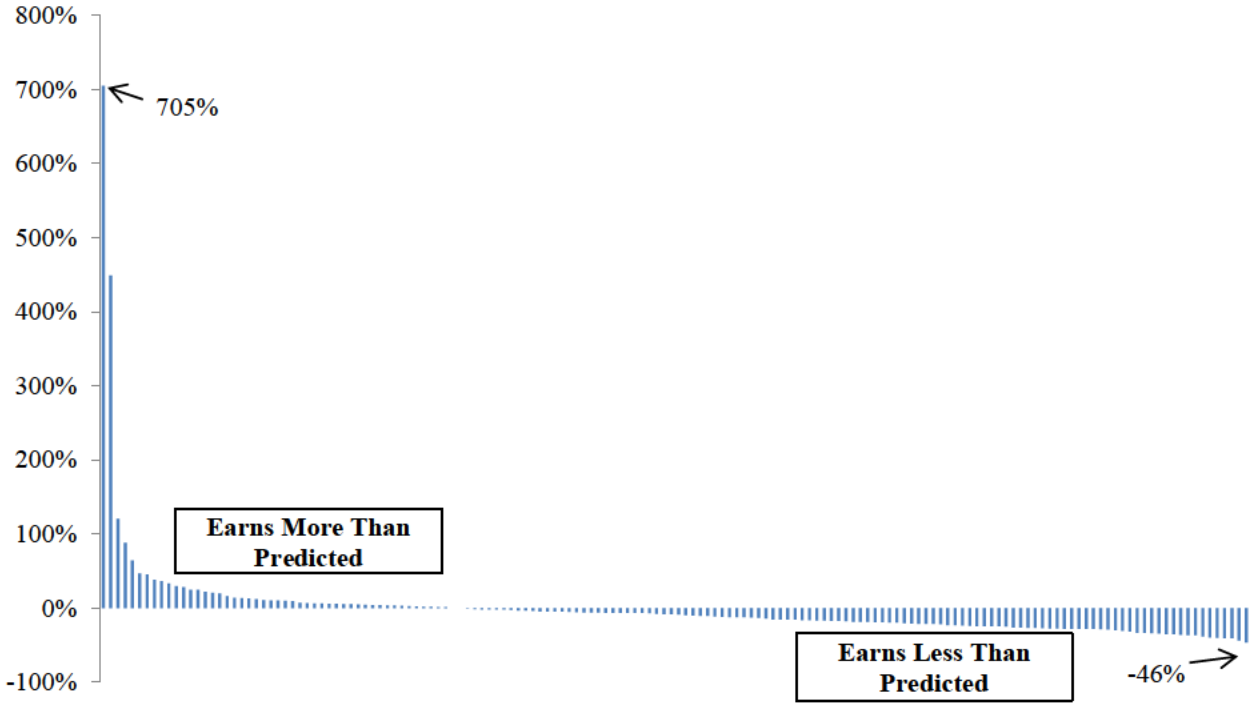
There is Wide Variation in the Percent Difference Between Actual and Predicted Total Compensation (Medicare Wages) for African Americans
- Prediction Based on OFCCP Model, Without a Race Control -
-2013 - 2018, African American Incumbents in PRODEV Job Function -



Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

93. The OFCCP model is flawed, both in how it measures total compensation, and in what variables it includes as relevant control factors, as I further discuss below. The statistical issue in this case is whether Asians doing similar work to Whites are paid less, after controlling for other factors that impact and explain pay. A regression model answers this question by predicting pay based on an individual's job and personal characteristics (as reflected in the variables the analyst chooses) and then comparing that prediction to actual pay. This approach hinges on having the correct control variables, because otherwise it is not comparing "apples to apples." What the charts above show is that relative to the average benchmark set by the regression model, women and Asians can be paid well above what the OFCCP model predicts or well below that amount. The OFCCP does not address or even discuss *why* pay

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diverges so much expected for employees supposedly doing similar work, or why the predictions their model generates are so far off from actual pay for so many employees.

The OFCCP theories of discrimination treat Oracle as a monolithic entity and their models are aggregated to reflect that, but their analyses show a wide variety of outcomes across Oracle that directly conflict with that conception of the company

94. In its March 11, 2016 Notice of Violation ("NOV"), the OFCCP claimed that Oracle discriminated against women, African Americans and Asians with respect to their pay. They used regression techniques to model gender and race pay differences in 2014 base pay after taking into account gender (race), work experience at Oracle, work experience prior to Oracle, full-time/part-time status, exempt status, and standard job title.[64] This is the same basic model the OFCCP uses in the subsequent SAC, although in the SAC the OFCCP applied the model on 2013 through 2016 data and used total compensation rather than base pay as the dependent variable.[65]

95. However, the OFCCP did not find issues at Oracle HQCA as a whole when analyzing data prior to issuing the NOV, but rather in three job functions for women, one job function for Asians, and one job function for African-Americans. If Oracle can be said to have a single set of pay practices, it should apply across all its job functions, and yet the OFCCP only claimed statistically significant disparities in three of the sixteen job functions they analyzed. I have not seen evidence that the process used to hire at Oracle over the time period covered by the OFCCP's allegations differed as between the three job functions they allege have pay issues and those they do not.

96. In the NOV, the OFCCP analyzed a database containing a 2014 snapshot of Oracle employees and their pay across 16 job functions at Oracle HQCA.[66] I used their program and data to run regressions

[64] Though the NOV states in Attachment A that global career level and job specialty were also accounted for, these factors are included in standard job title and so do not independently enter the model. DOL000001395-000001406.
[65] SAC, paragraph 13. For African Americans, however, the claim was still made about base pay and not total compensation. (SAC, paragraph 16)
[66] DOL000001395-000001406.

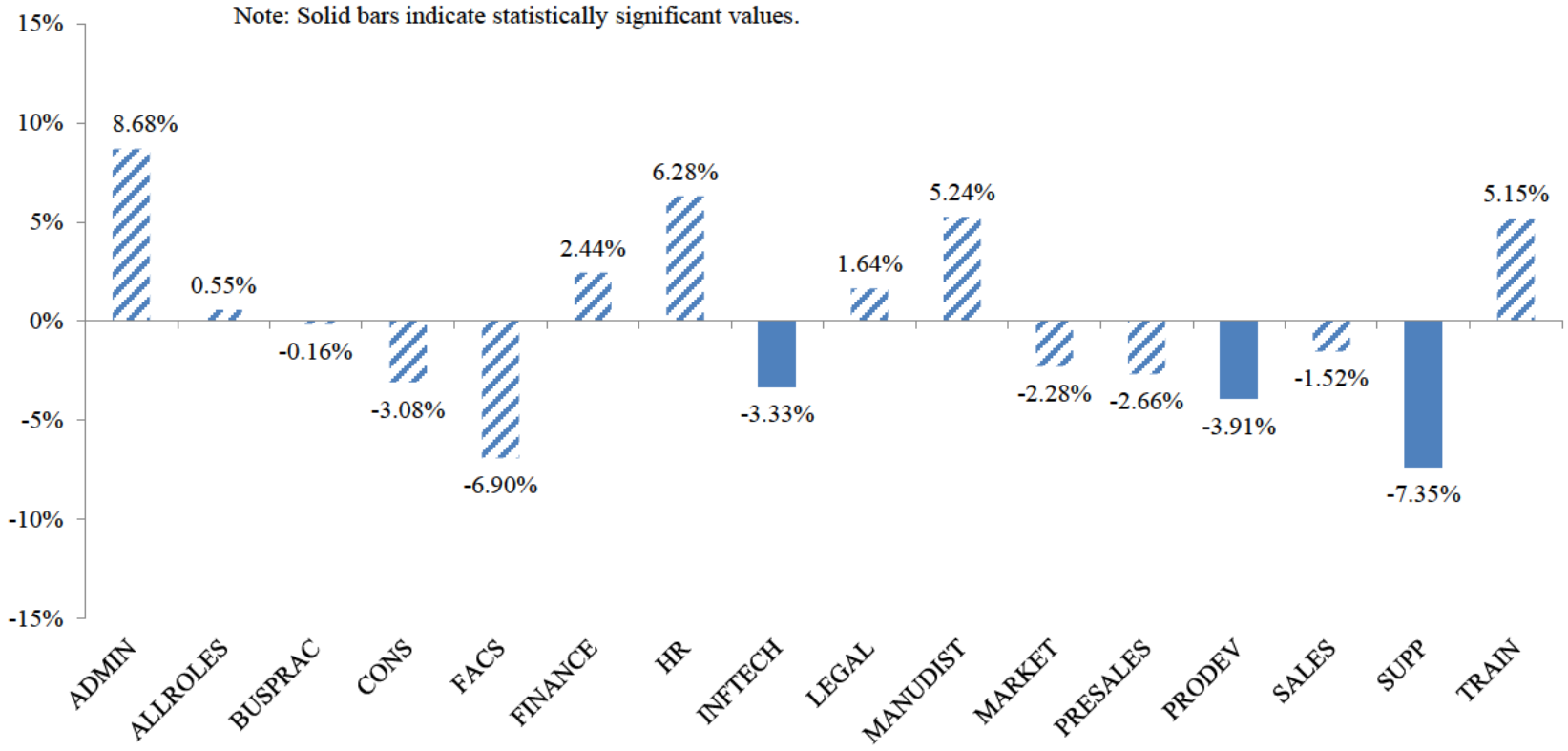
for all the job functions in the data.[67] The charts below show the coefficient on female and on Asian and African American found by running the OFCCP regression analysis. When the OFCCP applied the same regression model for all job functions, it did not find any statistically significant adverse pay differences for females other than in the PRODEV, INFTECH and SUPPORT functions and for Asians and African Americans, only in PRODEV.

97. The OFCCP does not makes claims across the board, and its NOV model generated pay differences adverse to the protected groups in only a subset of job functions. These findings are inconsistent with a claim that Oracle as a whole discriminates against these groups. But OFCCP nonetheless aggregated their regression models at the job function level.

[67] I was provided with OFCCP's backup programs and output with redacted sections and was able to replicate similarly to their findings for PRODEV, INFTECH, and SUPPORT. The OFCCP controlled for the following factors: standard job title (those with less than 5 employees are grouped together), full-time/part-time status, exempt status, global career level, job specialty, estimated prior work experience, and company. Note that grouping jobs with less than 5 employees together could group together very different employees with fundamentally different skills and responsibilities.

The OFCCP's NOV Analysis Shows No Systematic Pattern of Statistically Significant Results for Women vs. Men

- OFCCP Presented the Three Statistically Significant Results and Ignored Thirteen Job Functions With Insignificant Results -



Model controls for female, standard job title (ones with less than 5 employees are grouped together), part-time/full-time, exempt status, time in company, and estimated prior experience (age minus 18).

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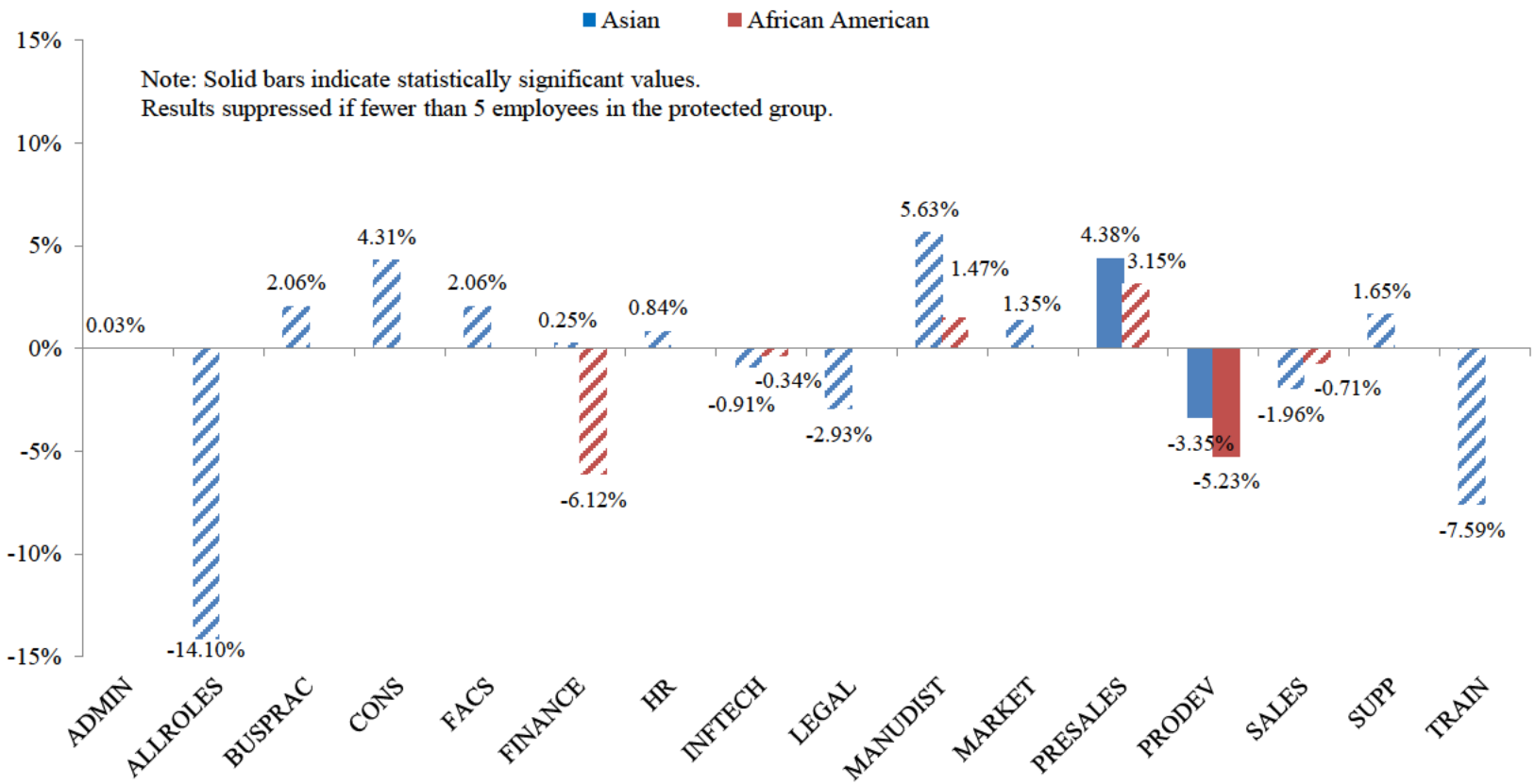
The OFCCP's NOV Analysis Shows No Systematic Pattern of Statistically Significant Results for Asians and African Americans

- OFCCP Presented the One Statistically Significant Negative Result and Ignored Fifteen Job Functions With Insignificant Results -



Model controls for race, standard job title (ones with less than 5 employees are grouped together), part-time/full-time, exempt status, time in company, and estimated previous experience (age minus 18).

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98. If pay outcomes at Oracle were due to some common, uniform practice used by all Oracle managers, there should be no manager-related patterns in the unexplained portion of pay (i.e., the difference between actual and predicted pay in the OFCCP model). One can examine this hypothesis by using the OFCCP model (without gender or race controls) to calculate the difference between actual pay and predicted pay using their model. Once this commonly applied model is run, we look at whether there are patterns in those residuals that suggest different supervisors make different decisions regarding pay for women and non-white employees, or whether no such patterns exist.

99. The pie chart below categorizes second-level managers[68] of women in all three job functions in 2014 according to the sign and significance of unexplained pay differences that come directly from the OFCCP model. I restrict the analysis to managers of at least ten employees and two women for convenience, but there is no issue with small sample sizes: the power of the statistical tests depends on the OFCCP model and data, not the number of employees being supervised.[69]

[68] The charts are based on managers two levels above the employee. Charts for third, fourth, and fifth level managers are in Attachment D.

[69] The same charts cannot be generated for African American employees because of the small sample size and our restriction to supervisors with at least 10 employees and 2 of the protected group.

Supervisors Two Levels Above Employee: Total Compensation (Medicare Wages) for Women
- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions -

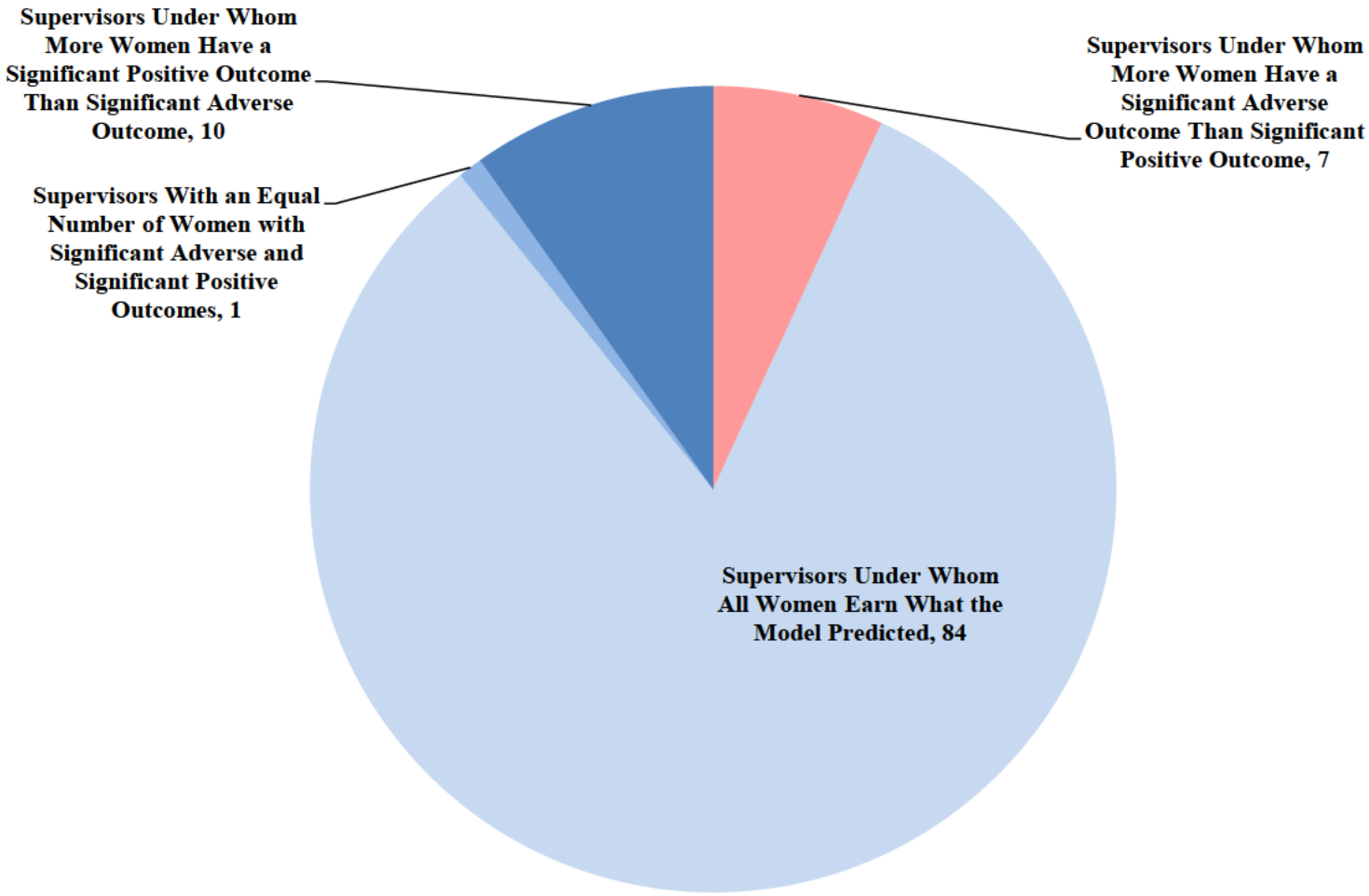

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 42.0% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

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100. The results show that for most managers, women earn about what the OFCCP model predicts they would make absent alleged discrimination (i.e., the difference between actual pay and the pay predicted by the OFCCP's aggregated model is not statistically significant). This is shown in the light blue slice of the pie chart above. The small, somewhat darker blue indicates managers under whom there are equal numbers of women who earn statistically significantly more than predicted and who earn statistically significantly less than predicted. The darkest blue slice represents managers under whom more women earn statistically significantly above the model's prediction than there are earning statistically significantly below predicted. The red slice indicates the share of managers under whom more women earn statistically significantly less than predicted than earn statistically significantly more. These results are generated using the OFCCP model with its flaws included – but even in that model, it is apparent that the pay experiences of women working under different managers varies considerably. This is inconsistent with a hypothesis of pay decisions being administered in a common, adverse, and centralized manner.

101. The pie chart above shows the distribution of managers according to the pay outcomes of the women they supervise. When the pie chart is instead redrawn to show the distribution of women under supervisors for whom more women in fact earn more or less than the OFCCP model predicts, it is clear that only a small minority of women work under supervisors where a greater number women are paid statistically significantly less than the OFCCP model predicts than are paid statistically significantly more than predicted under that same supervisor.

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Employees by Supervisors Two Levels Above: Total Compensation (Medicare Wages) for Women
- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

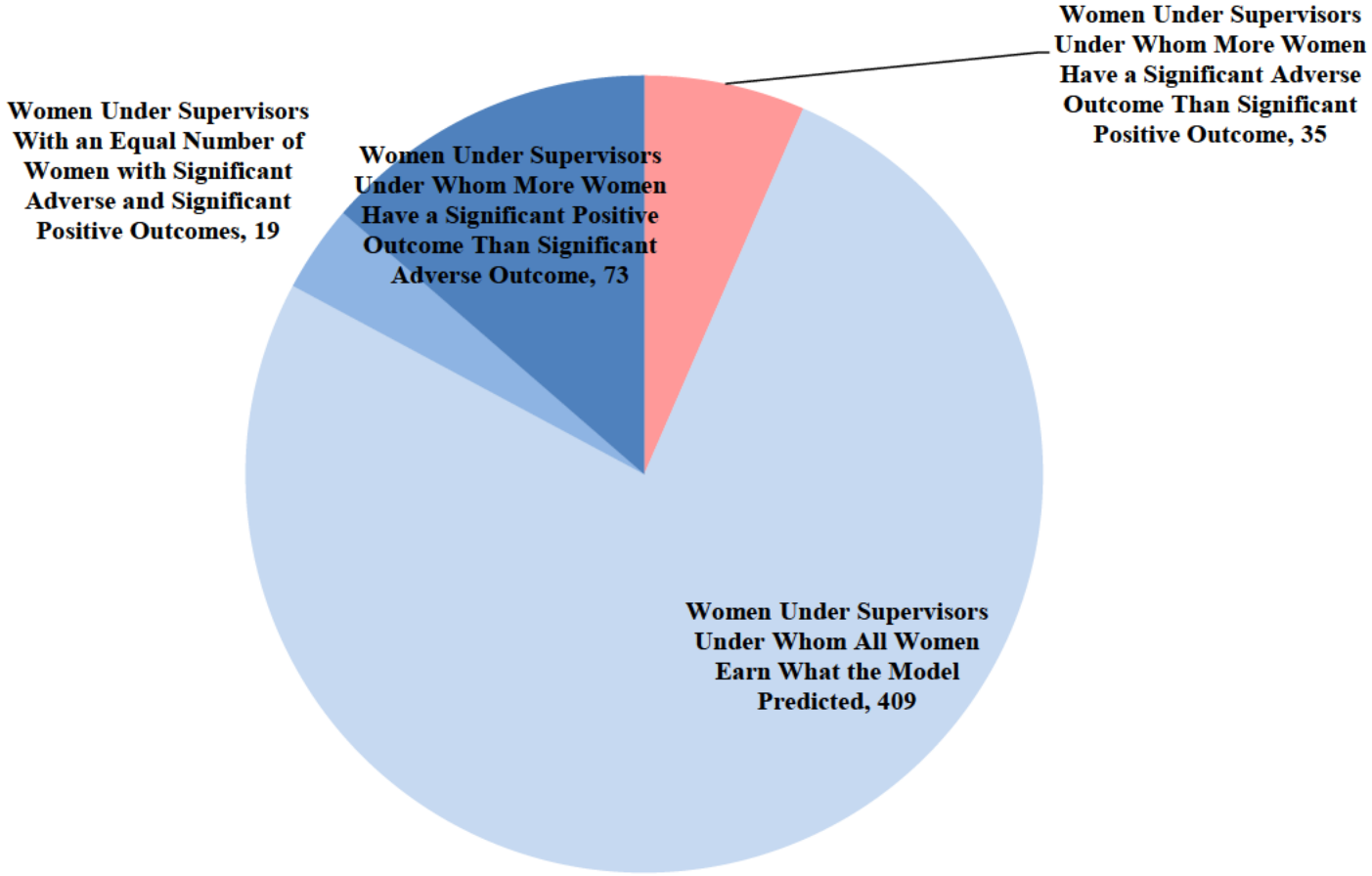

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 42.0% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

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102. The results for Asians also indicate a role for managerial decision making that the OFCCP model does not account for. Again, most supervisors of Asian employees in PRODEV have more Asians earning what the model predicts or earning statistically significantly more than that. Similarly, the majority of Asians work in supervisory units where more Asians tend to earn statistically significantly more than the OFCCP model predicts than earn statistically significantly less.

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Supervisors Two Levels Above Employee: Total Compensation (Medicare Wages) for Asians
- Prediction Based on OFCCP Model, Without a Race Control -
- PRODEV Job Function, 2014 -

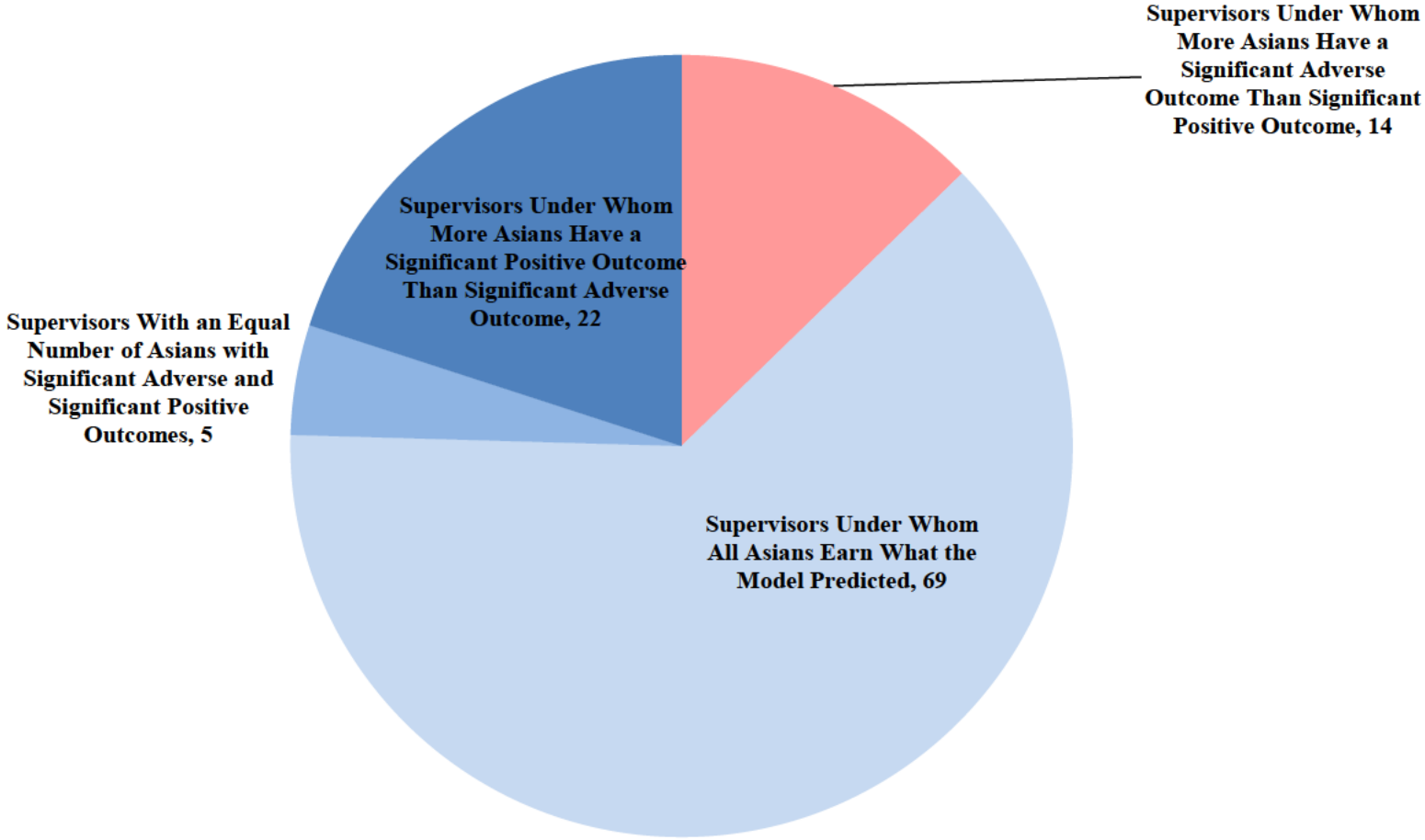

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 52.2% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

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Employees Under Supervisors Two Levels Above: Total Compensation (Medicare Wages) for Asians
- Prediction Based on OFCCP Model, Without a Race Control -
- PRODEV Job Function, 2014 -

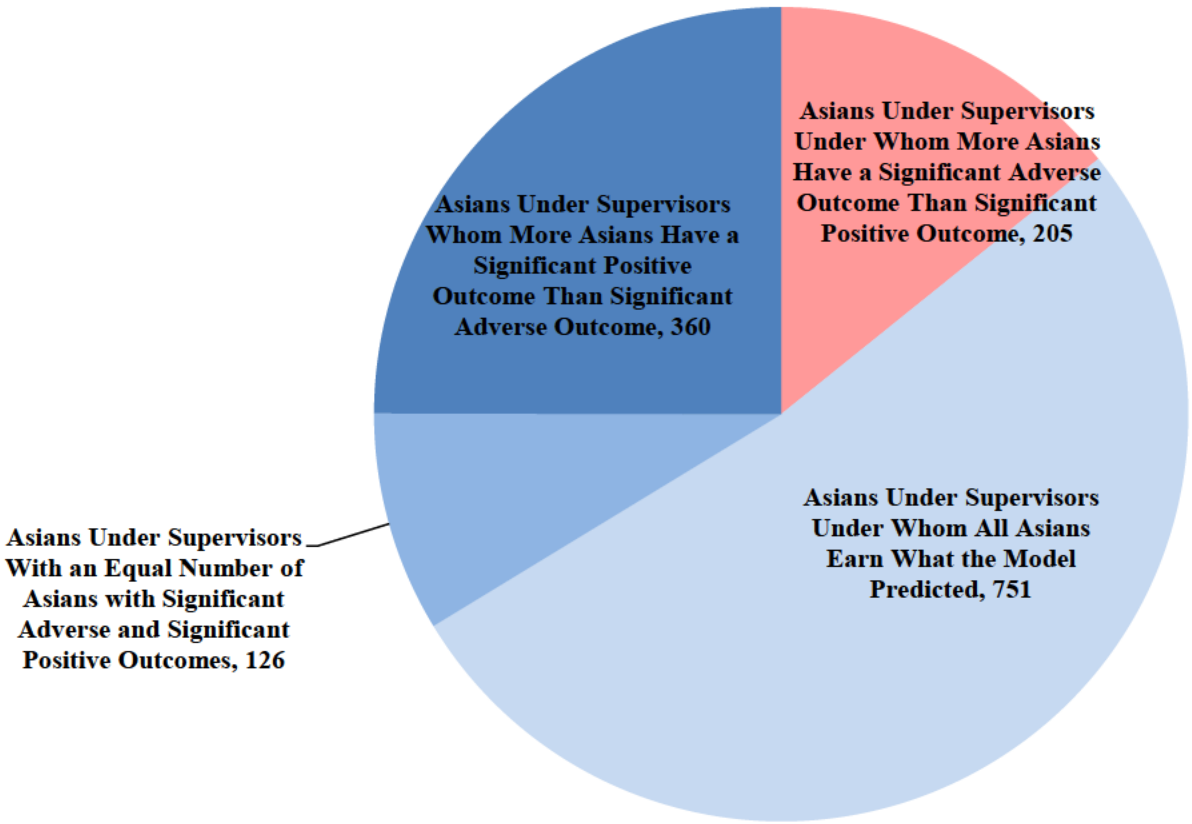

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 52.2% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

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103. The OFCCP claims three of sixteen job functions discriminate against women and/or Asians, but propose that this is accomplished with *companywide* policies regarding starting pay and pay raises and career development thereafter. Their discussion of that claim does not explain why only three job functions would be purportedly affected by companywide policies. One way to make sense of their argument is to claim managers in those job functions behave differently than the others.[70] That, however, leaves open the question of whether managers inside those job functions at issue also behave in varied ways, but their model fails to incorporate any managerial effect.

104. I turn next to a discussion of what the OFCCP did in their regression models, and why what they did is incorrect and highly misleading.

THE OFCCP ANALYSIS IS SERIOUSLY FLAWED AND DOES NOT SUPPORT THEIR CLAIMS WHEN THE REGRESSION APPROACH IS MORE REFINED

The OFCCP did not measure total compensation correctly

105. The OFCCP's NOV analysis is flawed in that it analyzes base salary rather than total compensation.[71] However, the total compensation measure adopted by the OFCCP in its SAC analysis is also incorrect. In its total compensation models, the OFCCP uses a measure from employee W-2 data called Medicare wages. But Medicare wages are simply the taxable earnings of an employee in that year.

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[70] This approach does not account for supervisory chains that cross job functions. For example, [redacted], an Asian male (Person ID 200179), was a manager in INFTECH until December 2011 when he transferred into PRODEV. [redacted], also an Asian male (Person ID 887465652), worked in INFTECH and was directly managed by [redacted] from April 2010 to February 2015. [redacted] also then transferred into PRODEV and continued to directly report to [redacted] for another year. (ORACLE_HQCA_0000070738_Emp_Personal_Experience_Qualification_Assign_Details.xlsx) According to the OFCCP hypothesis, [redacted] would not have been discriminated against by his manager while he was in INFTECH, but would have been upon moving into PRODEV under the same manager.

[71] It is total compensation that matters, and not simply base pay or even bonuses or stocks considered in isolation. From the Global Compensation Training Manual: "When recruiting you should consider the value of the "total reward" rather than salary alone, both tangible and intangible: Value of base salary, annual target variable (ATV)/bonus, Benefits (retirement plan, medical, life and disability insurance, car/car allowance, etc.), Oracle experience, training, career development, long term opportunities, location etc." (ORACLE_HQCA_0000000407_Global Compensation Training - 2011 Managing Pay Final (Native).PPTX)

The problem with this measure of total compensation is that the employees can receive significant amounts of stock in any given year, but due to awards vesting over time (four years typically for each award) the dollar value of an award given in a year will not appear in the year of the award, and hence not on that year's W-2. Instead, what will appear is taxable dollars from the exercise and sale of *previously received* options or the sale of *previously received* RSUs that occurred in that year. Thus, an employee can receive a share award in a given year, and not realize any dollars of taxable income related to that award until years later.[72] Taxable pay is also affected by the decisions employees make about 401k contributions[73], and by variations in the share exercise behavior of employees. If the purpose of the regression analysis is to examine earnings attributed to a particular year, one should not use the W-2 data. Total compensation for work performed in a year should instead be measured as base pay plus bonuses earned and stock awarded *in that year*. The data that was produced by Oracle permits this computation, but the OFCCP failed to use it correctly.

106. For example, Oracle employee [redacted] was a fulltime Senior Vice President for the entirety of 2014. His Medicare EE taxable entry was [redacted] and this is what OFCCP used as his total compensation for that year. The same data set shows his 2014 Regular Earnings were [redacted] and that [redacted]

[72] Oracle's 2018 Stock Plan describes tax consequences of various decisions by the employee regarding their stock options, which is very similar to previous years' plans: "If you exercise your options and hold the shares […], you will include in income as compensation an amount equal to the excess of the fair market value of the shares on the exercise date over the option exercise price. The included amount will be treated as ordinary income and, if you are an employee, will be subject to income tax and FICA (Social Security and Medicare) withholding by Oracle […]. If you exercise your options in a cashless sell-all transaction […], you will include in income an amount equal to the excess of the selling price of the underlying shares over the option exercise price. The included amount will be treated as ordinary income and, if you are an employee, will be subject to income tax and FICA (Social Security and Medicare) withholding by Oracle. […] If you are an employee, the income recognized upon exercise will be included on your Form W-2 for the year in which the option is exercised […]." RSUs are also treated as ordinary income when they vest. (Oracle_HQCA_0000416526_2000 LTIP 02 01 2018.pdf, p. 19-20, edited for readability.)

[73] According to the Employee Handbook, employees can contribute up to 40% of their cash compensation (salary, bonus and commission) on a pre-tax basis. (Oracle U.S. Employee Handbook, ORACLE_HQCA_0000000464)

[74] ORACLE_HQCA_0000070722_AllEarnings2.xlsx

[75] ORACLE_HQCA_0000581403_Stock_Data_Product_Statement_Combined.xlsx

[redacted] That he decided to exercise those options in 2014 does not mean that they represent his compensation for the work he did *in that same year*. His Medicare EE Taxable pay includes the delayed compensation he earned in other years but happened to cash in this particular year, presumably because he deemed it advantageous financially to do so. Counting his [redacted]. While this is a particularly vivid example, there are thousands of cases similar to this, where the OFCCP failed to properly measure total compensation for work performed in the year they were supposedly examining pay.

107. The example above shows how the OFCCP's measure can overestimate actual total compensation for employees in a given year. The OFCCP measure of "total compensation" also can severely underestimate actual total annual compensation. Employee [redacted] worked full time, all year as a Software Developer 2 in 2013. His base pay in the data was [redacted]; his Regular Earnings were [redacted], and his Medicare EE Taxable pay was [redacted] He earned [redacted] and was awarded [redacted]. Correctly calculated, this employee's total compensation in 2013 was [redacted] To correctly measure total compensation associated with work in a given year, the OFCCP should have used base pay plus bonuses earned and stock awarded within that year.[76]

<u>The factors the OFCCP adopted as control variables in their Notice of Violation and Second Amended Complaint regression models do not similarly situate employees with respect to their characteristics and the nature of the work they are doing</u>

<u>The OFCCP used flawed measures of tenure and experience in their Notice of Violation analysis, which they then repeated in their Second Amended Complaint analysis</u>

108. The OFCCP included a proxy intended to measure prior work experience, as well as tenure at Oracle America, Inc., in the analyses supporting their claims in the NOV and in the SAC. Prior

[76] See US Manager's Orientation presentation dated December 6, 2016 (ORACLE_HQCA_0000042091_MASTER US Manager Orientation 1201 (Native).PPTX) which describes the components of compensation and divides it into base pay, short-term incentives (bonuses), and long-term incentives (stock options and restricted stock units).

experience was measured as age minus 18 minus years at Oracle America, Inc.[77] Time worked at Oracle affiliates in other countries (like Oracle India), and time worked at companies that were later acquired by Oracle, are thus counted as prior experience rather than as Oracle experience. This error was easily avoided using the data provided in the case. The data contain, and OFCCP could have used, an employee's "continuous service" hire date to measure total Oracle tenure, which includes any time spent in other Oracle affiliates or at a firm that was acquired.

109. "Human capital" is the knowledge and skill an employee gains through education and labor market experience. Economists distinguish between "general" human capital, or skills and abilities that an employee would bring to any firm, and "specific" human capital, i.e., the detailed knowledge more valuable to a particular company than to other companies. [78] The OFCCP analysis confuses the two by grouping years worked at directly relevant entities (non-U.S. Oracle affiliates and acquisition targets) in with all other potential work experience rather than counting it as Oracle-specific relevant experience along with time at Oracle America, Inc. A person working on Oracle products and services at its India affiliate is more likely to have direct relevant experience to Oracle products and services in the United States. Similarly, someone whose company is acquired by Oracle is more likely to have direct relevant experience to the work they perform once they are at Oracle.

110. The OFCCP method for estimating prior experience is over-inclusive, in that it counts as general experience years which should be counted as "tenure at Oracle," and also in that it counts all years since age 18 prior to joining Oracle America, Inc. as prior work experience without accounting for periods of unemployment or other non-work periods. Again, prior experience is measured in OFCCP models as age minus U.S. Oracle tenure minus 18 years. Someone who took a year off before applying to Oracle, such as Employee ID 892041040 who was hired in February 2013, is credited by the OFCCP as having the

[77] More typically, years at college are not included in these kinds of measures and so I use age minus total Oracle tenure minus 22.

[78] Becker, Gary S. *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press, 2009.

same amount of prior experience as someone of the same age hired in 2013 who did not take a year off.[79] Because women are more likely to have breaks in their work histories, "potential" work experience tends to over-estimate prior experience for women more than for men.[80] This in turn leads to biased regression models because the model credits many women with more prior work experience than they in fact have, and so over-predicts expected pay.

111. These crude techniques for estimating experience also do not account for the relevance of that experience. A Software Developer's summer cashier job in a bookstore, for example, does not convey anything useful to a technology company assessing their programming skills. This is not an abstract concern. Employee 891368075 was hired as a User Experience Developer 3. The OFCCP's method for defining prior experience treats her year working at [redacted], trainer, and campus representative the same as her years of work at [redacted].[81]

<u>The OFCCP did not take leaves of absence into account</u>

112. The OFCCP tenure measures are also incorrect because they do not take leaves of absence into account. An employee who had a heart attack and missed seven months of work, for example, has less tenure than an employee hired the same day who worked continuously over the same time frame. This matters when it comes to compensation, because all else constant, more time spent engaged doing work is generally correlated with increased productivity and pay, as is well-established in the labor economics literature.[82] This is of particular interest in the gender context because women tend to take more leave

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[79] The manager comments for Vacancy ID 1945800 note that "[redacted]."

[80] Mincer, Jacob, and Solomon Polachek (1978). An Exchange: The Theory of Human Capital and the Earnings of Women: Women's Earnings Reexamined. *The Journal of Human Resources* 13(1):118-134. Killingsworth, Mark R., and James J. Heckman. (1986) "Female labor supply: A survey." *Handbook of Labor Economics* 1: 103-204.

[81] Person ID 891368075, whose resume appears in ORACLE_HQCA_0000083390.pdf. This person also does not list any work experience between October 2007 and May 2009, but the OFCCP method of counting experience would not account for this.

[82] See Ehrenberg, Ronald G., & Smith, Robert S. (2015). *Modern Labor Economics: Theory and Public Policy*. Twelfth Edition. Pearson, pp. 390-391 on how as a general principle earnings tend to increase

than men.[83] Incorrect tenure measures for women are a well-documented issue in estimating pay regression models.[84] Essentially, the regression model systematically over-predicts pay for those who take time off from work because it assumes they have more time on the job than they actually do. In other words, the gap between actual pay and predicted pay is exaggerated because the model does not measure work experience properly. The omission of leaves of absence biases the prior experience estimates for all leave takers; but because women take more leave than men on average – both in general and at Oracle in particular – this means that the effect is more problematic for women than men.[85] Also, from a practical perspective, bonuses at Oracle may also be adjusted to take time worked that year into account – so the failure to account for leave is problematic for analyzing bonuses as well.[86]

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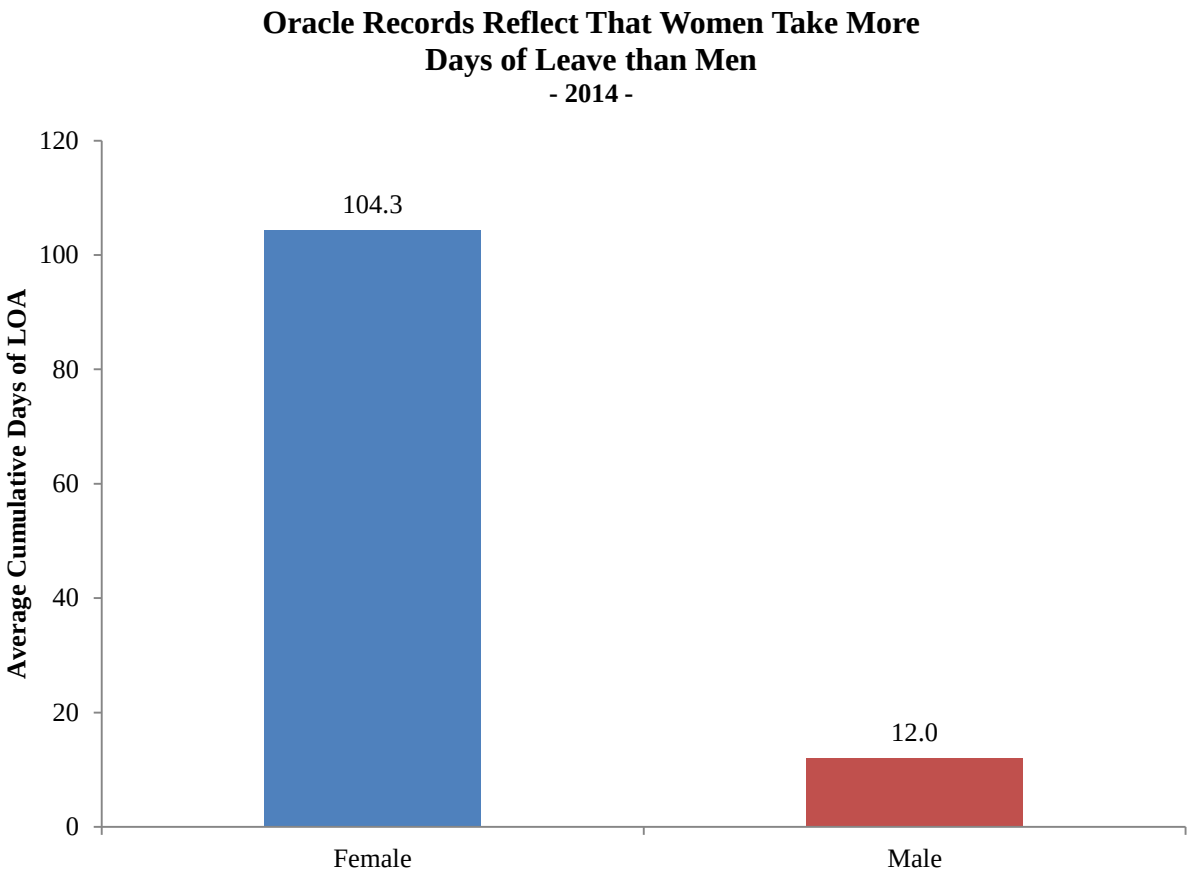
with job tenure because of on-the-job training and experience. This general principle not hold true in every specific instance, however, and it is not true of all jobs at Oracle. As noted in this report, there are jobs for which the pay premium from additional tenure is very different from other jobs.

[83] Mincer, Jacob, and Polachek, Solomon (1974). "Family investments in human capital: Earnings of women." *Journal of Political Economy*, 82(2, Part 2): S76-S108. Spivey, Christy (2005). "Time off at what price? The effects of career interruptions on earnings." *ILR Review*, 59(1): 119-140. Waldfogel, Jane (1998). "Understanding the" family gap" in pay for women with children." *Journal of Economic Perspectives*, 12(1): 137-156.

[84] Mincer, Jacob, and Polachek, Solomon (1978). "An Exchange: The Theory of Human Capital and the Earnings of Women: Women's Earnings Reexamined." *The Journal of Human Resources* 13(1):118-134. Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz (2010). "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors." *American Economic Journal: Applied Economics*,2(3): 228-55. Goldin, Claudia. (2014) "A grand gender convergence: Its last chapter." *The American Economic Review* 104, no. 4: 1091-1119. Blau, Francine D., and Lawrence M. Kahn. (2017) "The gender wage gap: Extent, trends, and explanations." *Journal of Economic Literature* 55, no. 3: 789-865. Killingsworth, Mark R., and James J. Heckman. (1986) "Female labor supply: A survey." *Handbook of Labor Economics* 1: 103-204.

[85] For a study of how loss of experience affects men who temporarily leave the labor force, see Angrist, Joshua D., Stacey H. Chen, and Jae Song. (2011) "Long-Term Consequences of Vietnam-Era Conscription: New Estimates Using Social Security Data." *American Economic Review*, 101 (3): 334-38.

[86] At Oracle, bonuses can be prorated for work during the year. "Furthermore, bonuses may be prorated to reflect time not worked in a bonus period (due to leave of absence, transfer, new hire, part-time, or change of status from hourly to salaried.) Oracle U.S. Employees Handbook, p. 42. (ORACLE_HQCA_0000000464.pdf)



113. For acquisitions and transfers from non-US Oracle affiliates, the leave data is incomplete because the available data indicates their original hire date at the predecessor company but does not record their leave histories at that company. This can be controlled for at least in part by including variables that indicate an employee came to Oracle through a lateral transfer from an affiliate or were an experienced external hire.

<u>The OFCCP did not control for time in standard job title, a factor which impacts pay within a job, and which is used by Oracle managers in promotion decisions</u>

114. OFCCP did not control for tenure in the current standard job title. But the research literature in labor economics is quite clear about the importance of job-specific skills in explaining pay and

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promotion.[87] Time in standard job title also appears in the information managers compile to justify a pay raise or promotion.[88] In contrast, the OFCCP model considers someone new to a position to be as skilled as someone who has worked in the position for years, as long as both were hired at Oracle in the same year.

The OFCCP does not control for the products or services employees work on, and instead simply aggregates together employees working on very different products requiring different skills and abilities

115. Labor economists have shown that pay is a function of productivity, and the more the employee contributes to the bottom line, the more they tend to be paid.[89] All else constant, an employee working on a highly profitable product or an innovative new product with high profit potential will be paid more than an employee working on a low profit margin product.[90] The employee on a highly profitable product or a

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[87] Becker, Gary S. (2009) *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press. This phenomenon is also studied in the job matching literature, examining how well workers match to jobs. See, for example, Jovanovic, Boyan. (1979) " Job Matching and the Theory of Turnover." *The Journal of Political Economy*, Vol. 87, No. 5: 972-990.

[88] ORACLE_HQCA_0000022967 IC Promotion Template.pdf. The PRODEV templates also track industry experience. ORACLE_HQCA_0000022954 PD Promotion Template.pdf. ORACLE_HQCA_0000023006 PD Manag Promotion Template.pdf.

[89] In labor economics, wages in the short run are influenced by wages in the market, the demand for the company's product and the structure of the market they compete in. See for example, Cahuc, Pierre and Andre Zylberberg (2001) *Labor Economics*, Cambridge: The MIT Press, p. 175. Firms also often link pay to group or company profits when work by necessity is organized in teams and individual output is difficult to observe (as is the case with software developers whose productivity is not measured simply by number of lines of code, for example, because quality of code is prized over quantity). Ehrenberg, Ronald G., and Robert S. Smith (2015) *Modern Labor Economics: Theory and Public Policy*. Twelfth Edition. Pearson Education Inc., pp. 60-70, p. 374. Lazear, Edward, P. (2000) "Performance Pay and Productivity." *American Economic Review*, 90 (5): 1346-1361. These factors are readily apparent in managers' business justifications for raises and promotions as well. "If [redacted] were to leave the [redacted] team, we will not be able to meet the current release schedule for [redacted] and this will have a significant impact not only on our Fusion Middleware customers, but our Oracle Enterprise Repository customers into the foreseeable future. While these products contribute roughly [redacted] in license revenue for Oracle by themselves, they are key differentiators to a growing segment of our middleware customers. Further, [redacted] is cited as a key differentiator against [redacted] offerings. We need to continue to invest and accelerate the applicability of this product in the context of application integration to further our differentiation against our [redacted] [redacted] competitor." (ORACLE_HQCA_0000423688_CF_81005385_478564052.xlsx)

[90] Kate Waggoner was asked in her deposition what product had to do with salary setting. "Product, if I'm thinking like software developers, the product they are developing, if it's a really old legacy product or a cutting edge new product, and there's not a lot of talent out there that know how to do this, they would command a higher position in the range versus somebody who's working on J.D. Edwards that's existed forever." Waggoner May 1, 2019 deposition 91:4-10.

strategic product considered key to future growth is also more likely to be recruited by a competitor, thereby driving up their pay at Oracle.[91]

116. It is my understanding that "organization" recorded for each employee in the data is correlated, at least in a general way, with products and services worked on. This is reflected in the declaration of Steven Miranda and letters between the attorneys in the present matter, as well as in the requisitions discussed above.[92]

117. In the incumbent pay models, I control for both standard job title and organization.[93] While an organization may encompass more than one product or service, the variable is a useful proxy for the

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[91] This is evident from the managerial justifications for salary increases and promotions called "Dive and Save" interventions. For example, pay raises for several employees on a team were described as necessary because "One of our [redacted] groups, the [redacted] recently lost 3 of their 8 people. Several companies in the area are heavily recruiting from our [redacted] database teams. Top developers who joined in the last few years are especially vulnerable [sic]." (See ORACLE_HQCA_0000423720_CF_81077593_478616283.xls; ORACLE_HQCA_0000423721_CF_81077832_478616360.xls; ORACLE_HQCA_0000423722_CF_81077871_478616398.xls; ORACLE_HQCA_0000423723_CF_81077970_478616422.xls; ORACLE_HQCA_0000423724_CF_81078057_478616432.xls)

[92] The "Organization_Name" field contains alphanumeric codes that reflect the cost centers in which each employee works. Cost centers are developed, altered, or deleted in partnership between finance, the business, and HR. These groups work together to organize jobs by product or service, and use the resultant cost centers for purposes of tracking budget, allocating pools of money that can be used for salary increases or bonuses, and tracking other financial outcomes. Not every product or service team at Oracle has its own "Organization_Name," however. (Letter to Laura C. Bremer from Jinnifer Pitcher, June 29, 2018, Re: OFCCP v. Oracle, Inc., et al., Case No. 2017-OFC-00006 Response to June 8, 2018 Letter Re: Data Questions)

[93] Organizations indicate cost centers. "Oracle organizes its business, teams, and employees through a financial and accounting hierarchy. This financial and accounting hierarchy mirrors the managerial hierarchy at a high level but often diverges from the managerial hierarchy at a more granular level. That divergence occurs because managers may oversee more than one product team, as that term is defined for the purposes of the financial and accounting hierarchy. Conversely, what is a single product team for financial and accounting purposes may have multiple managers. **At the most granular level of the financial and accounting hierarchy, "cost center" (sometimes called "organizations") are used for purposes of tracking budget and other financial outcomes. A cost center can encompass a single product or service team, but not every product or service team** has its own cost center." Miranda Declaration, paragraph 8, (ORACLE_HQCA_0000607281).

See also: The "Organization_Name" field contains alphanumeric codes that reflect the cost centers in which each employee works. Cost centers are developed, altered, or deleted in partnership between finance, the business, and HR. These groups work together to organize jobs by product or service, and use the resultant cost centers for purposes of tracking budget, allocating pools of money that can be used for salary increases or bonuses, and tracking other financial outcomes. Not every product or service team at

importance of the content of the work being performed. According to the data, HQCA employees in the relevant job functions worked in 1,039 organizations during the 2013-18 time frame.

The OFCCP does not control for patent awards, a sign of innovation and expertise

118. Companies like Oracle rely on patented technology to build their business in innovative directions and reap the rewards, which can be in the billions of dollars. The race to prove ownership is intense, and the legal battles frequently spill into public view.[94] A company will not know in advance which patented product will be most successful, so it is in their interest to patent as much as possible. Consequently, Oracle has a patent application bonus system in place, which awards up to [redacted] to a person or team that proposes a patent and passes the internal review by the Patent Review Committee and an outside patent attorney interview.[95] Oracle also maintains an internal web page for employees interested in the patent process that keeps track of patents and serves as "a training resource for prospective inventors. Access to issued and pending Oracle patents can provide prospective inventors with information about the state of the art and what ideas have already been patented at Oracle, either by looking at what their colleagues have patented or by using the engine's semantic search features."[96] The subject of the patent must be new or a significant technical improvement over other solutions and have a significant contribution to the business; the person or team applying for the patent must be able to explain how it is built or how it functions.[97] In the three HQCA job functions in the data, over [redacted] of employees earned one or more patent bonuses.[98] This varies across the company, with [redacted] of IC 6 level employees in PRODEV having ever earned such a bonus. Patent-level work is potentially of enormous value to the

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Oracle has its own "Organization_Name," however. (Letter to Laura C. Bremer from Jinnifer Pitcher, June 29, 2018, Re: OFCCP v. Oracle, Inc., et al., Case No. 2017-OFC-00006 Response to June 8, 2018 Letter Re: Data Questions)

[94] For example: "Apple and Samsung End Smartphone Patent Wars," *New York Times*, June 27, 2018; "Google loses Android battle and could owe Oracle billions of dollars," money.cnn.com, March 28, 2018.

[95] ORACLE_HQCA_0000414372_patent Primer 07-07-2014.pptx, July 8, 2014.

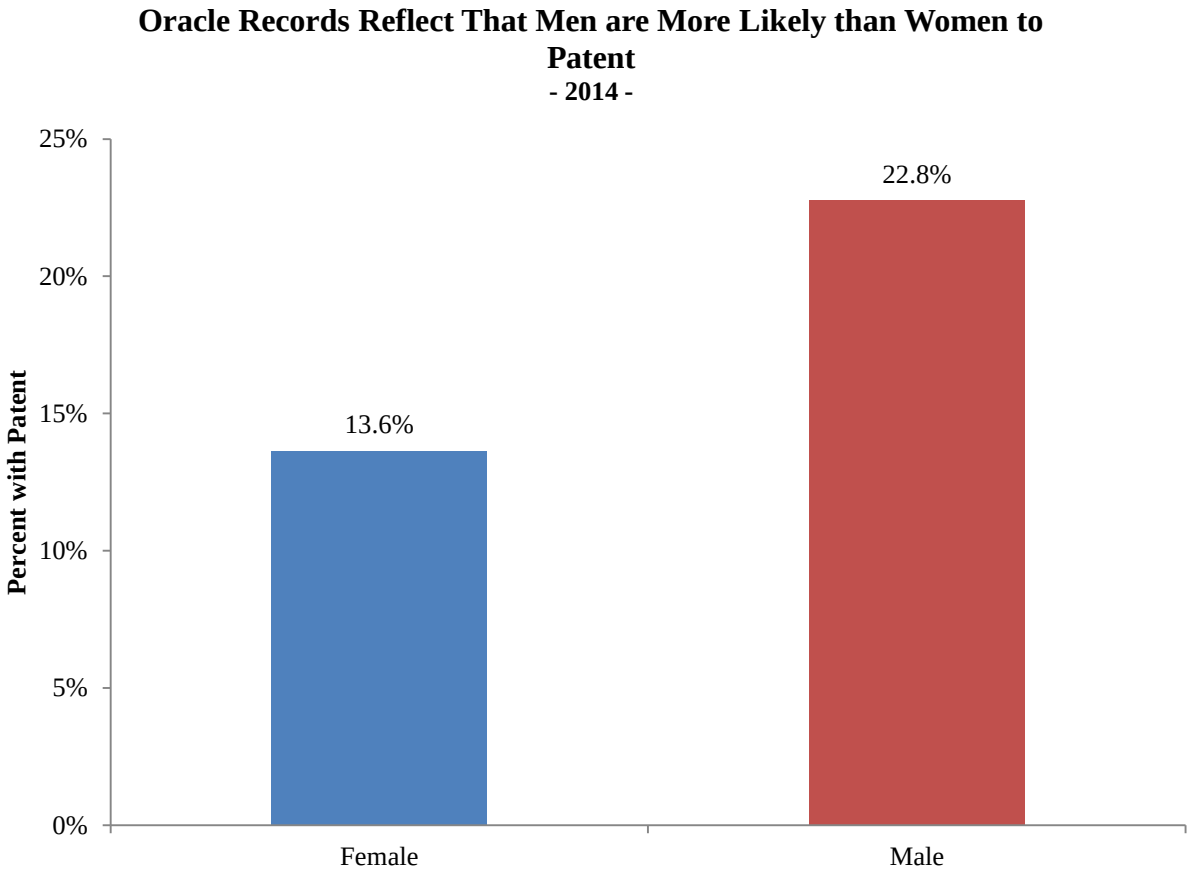
[96] ORACLE_HQCA_0000417308-0000417309.tif

[97] ORACLE_HQCA_0000414372_patent Primer 07-07-2014.pptx, July 8, 2014.

[98] Counting each full-year employee in 2013-2014 once, 19.8% of employees have ever been awarded a patent bonus. Extending the time period to 2013-2018, 19.3% of employees have ever been awarded a patent bonus.

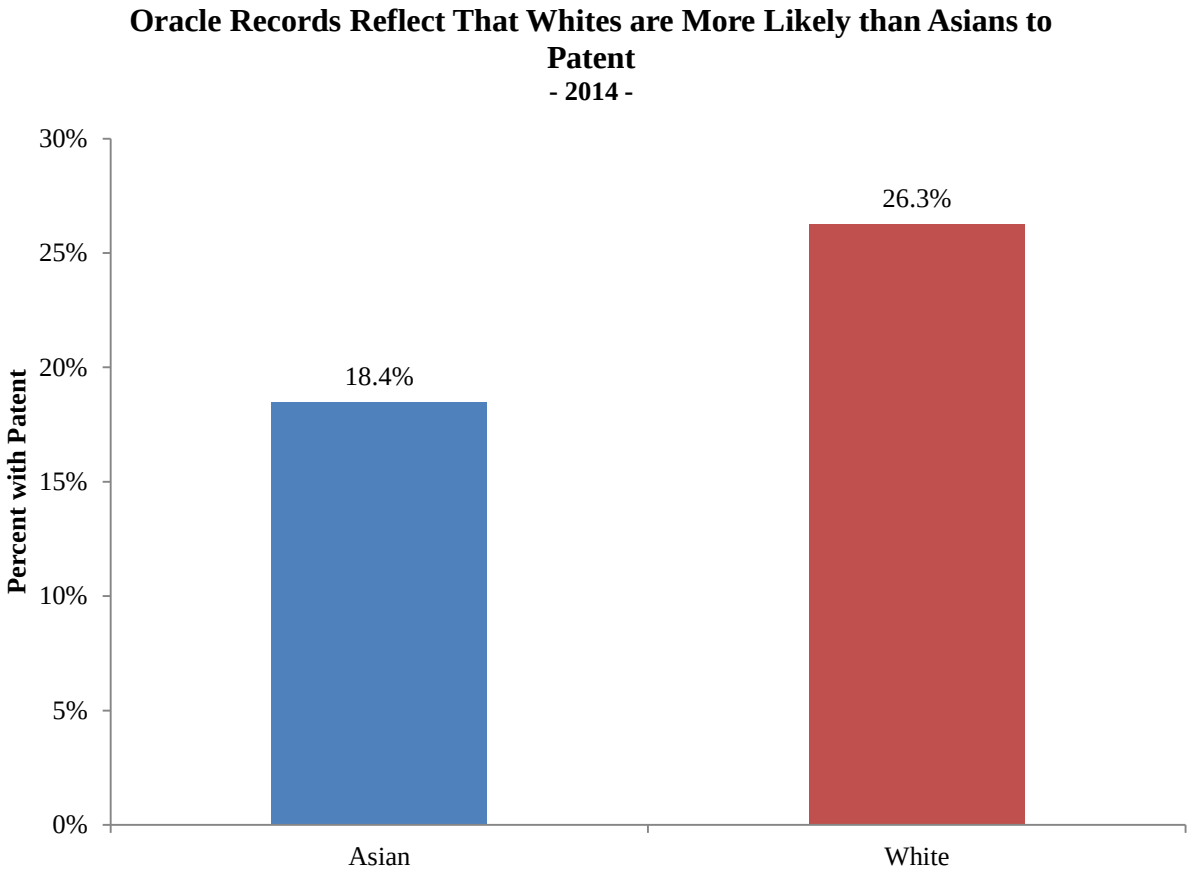
company, and will generally correlate with high levels of skill and innovative ability not otherwise captured by measures of experience that OFCCP used (like age or years since hire at Oracle).[99]

119. The failure to control for exceptional innovation and expertise (proxied by generating patent-able work) will bias results in the OFCCP model, because the patent bonus data indicate that men and women at Oracle file for patents at different rates, as do Asian and white employees. This is not just because some employees got a patent bonus that boosts their total compensation, but because the fact that they were associated with a patent indicates they are particularly high productivity employees, holding constant their other characteristics.[100]



[99] Patents also serve as an objective measure of individual or group productivity, which can be especially useful in white collar positions where productivity is not otherwise directly observable. Ehrenberg and Smith (2015), *Modern Labor Economics* pp. 373-376.

[100] "[…] if it's a really old legacy product or a cutting edge new product, and there's not a lot of talent out there that know how to do this, they would command a higher position in the range versus somebody who's working on J.D. Edwards that's existed forever." Waggoner May 1, 2019 deposition 91:5-10.



The OFCCP claims visa holders are paid less but does not test this

120. The OFCCP has expressed concern that Oracle prefers to hire employees on work visas as a source of less expensive labor. "This strong preference for a workforce that is dependent on Oracle for authorization to work in the United States contributes to Oracle's suppression of Asian employees' wages."[101] But the OFCCP did nothing to account for H-1B work visa status in their SAC model.

[101] SAC, paragraph 39.

EXAMINED MORE CAREFULLY, THE DATA SHOWS NO PATTERN OF STATISTICALLY SIGNIFICANT PAY DIFFERENCES FOR WOMEN, ASIANS, OR AFRICAN-AMERICANS

121. In this section, I present modified regression models examining total compensation at Oracle that address some of the issues discussed above. Specifically, I present the results of modified regression analyses that add controls for total Oracle tenure (based on continuous service date that includes time worked at non U.S. Oracle affiliates or acquired firms), cumulative time spent on leave of absence, time in standard job title, organization, whether the employee ever has a patent bonus, whether there was a leave of absence in the current year, and whether they arrived at Oracle as an experienced hire or through an acquisition. These regression analyses still group employees together by high-level job function, which mirrors OFCCP's approach. Even aggregated in that way, the analyses show that there is no evidence of systematic adverse pay outcomes for women, Asians, and African Americans at Oracle.

These results do not show any patterns of statistically significant pay differences across years or job function

122. The chart below depicts the coefficients on female by job function and year. The bar furthest to the right, for example, indicates that women on average earned 10.03% more than men, all else constant, but that this disparity could have occurred by chance at conventional levels of statistical significance (i.e., the coefficient is not statistically significantly different from zero). Striped bars indicate the coefficient is not statistically significantly different from zero according to the factors included in the model. Solid bars indicate statistical significance, such that total compensation is on average different between men and women or between protected race categories relative to white employees.

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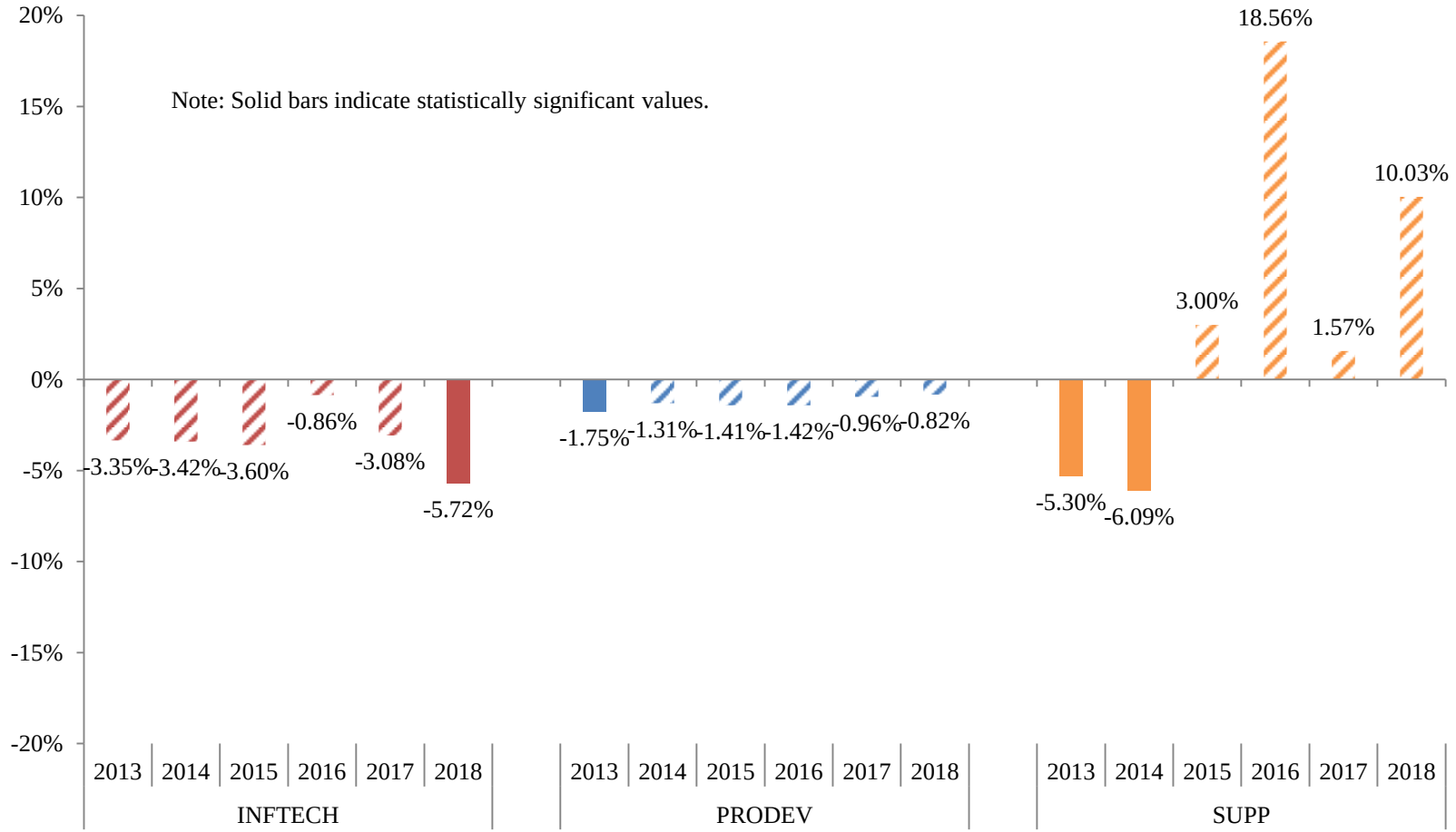
Modified Regression Analysis of Total Compensation Shows No Systematic Pattern of Statistically Significant Results for Women vs. Men Across Years or Job Functions



Model controls for female, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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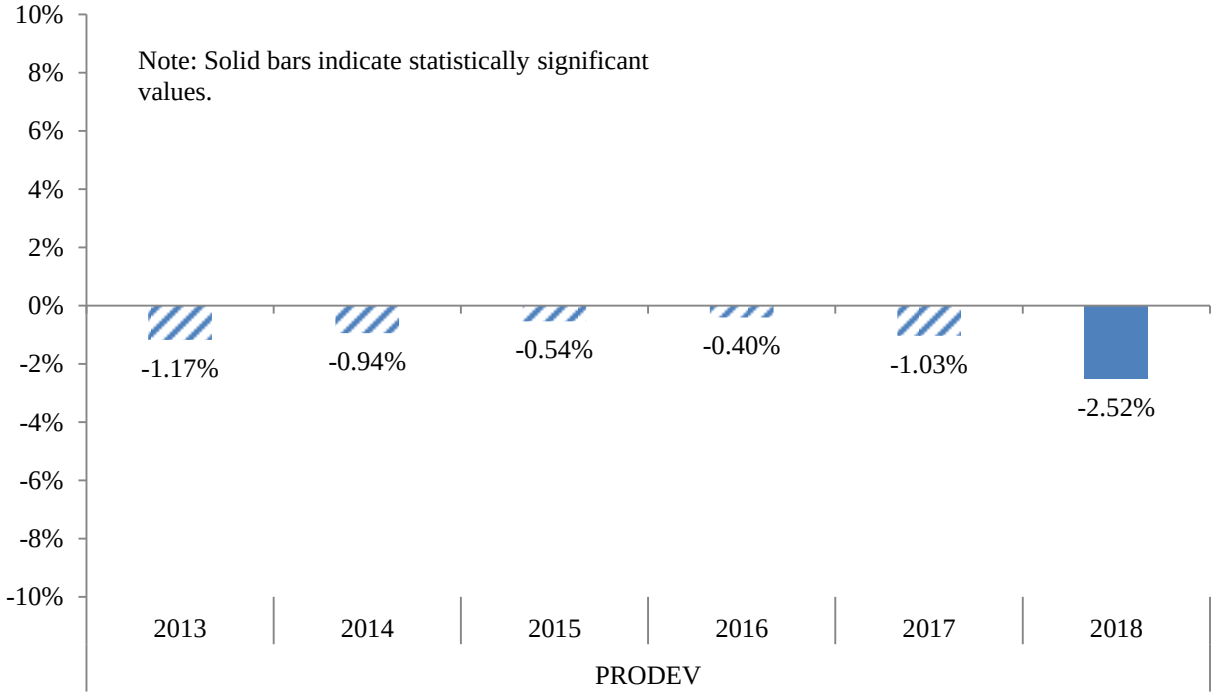
123. The results show that there is only one year (and not the same year) showing a negative and statistically significant pay disparity on average in total compensation between women and men in each of the PRODEV and INFTECH job functions. There are two statistically significant adverse results on average in the SUPPORT function in 2013 and 2014, but from 2015 onwards, the coefficients are all positive (although not statistically significant). Overall, these results do not demonstrate a pattern that would support a hypothesis of systematic and wide-scale pay discrimination against women at Oracle HQCA.

124. The same regression model was used to estimate pay disparities between Asians and Whites in PRODEV (the only job function the OFCCP makes claims about for Asians). The chart below shows only one year of statistically significant adverse result on average for Asians in PRODEV, in 2018. There is no evidence of a systematic adverse pay disparity on average between Asians and Whites at Oracle HQCA.

Modified Regression Analysis of Total Compensation Shows No Systematic Pattern of Statistically Significant Results for Asians vs. Whites Across Years Within PRODEV



Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

125. The OFCCP also makes claims about pay disparity for African Americans in PRODEV. The chart below shows that total compensation for African-Americans is never statistically significantly different from that of Whites at Oracle HQCA.

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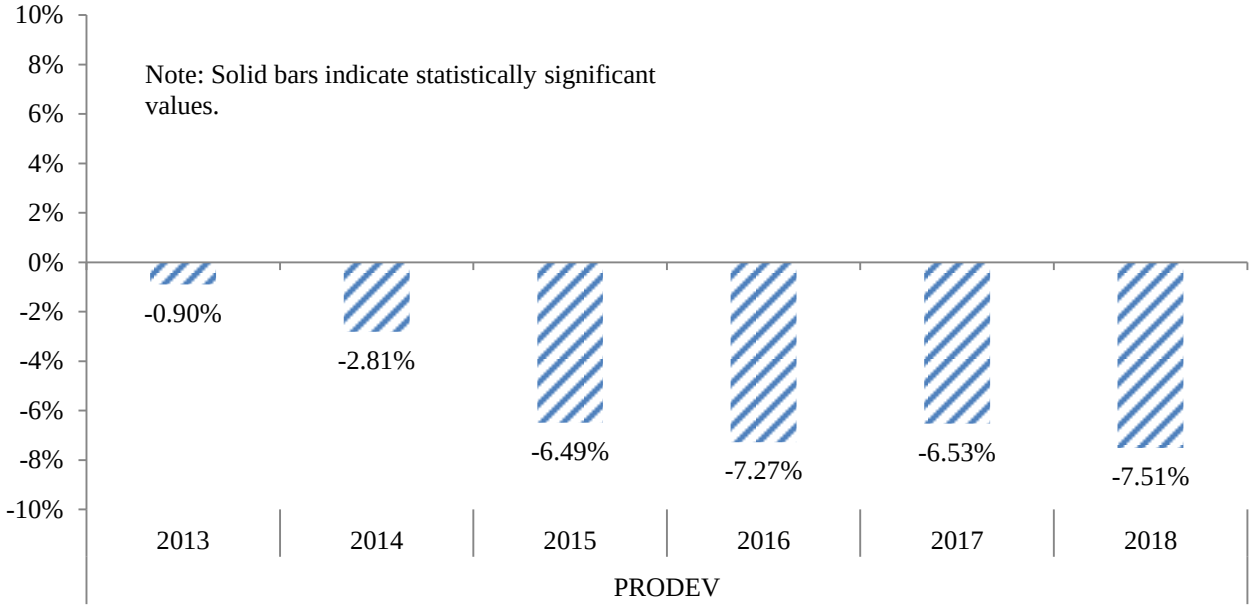
Modified Regression Analysis of Total Compensation Shows No Statistically Significant Results for African Americans vs. Whites in Any Year Within PRODEV



Model controls for African American, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

<u>These results do not show any pattern when examining managers separately from individual contributors</u>

126. As the charts below show, [redacted] tend to receive a greater share of their total compensation in bonuses and stock awards than [redacted]. Given that there are different emphases on the type of compensation awarded by Career Level, it is instructive to estimate the compensation regression models separately for IC Career levels and M Career Levels.

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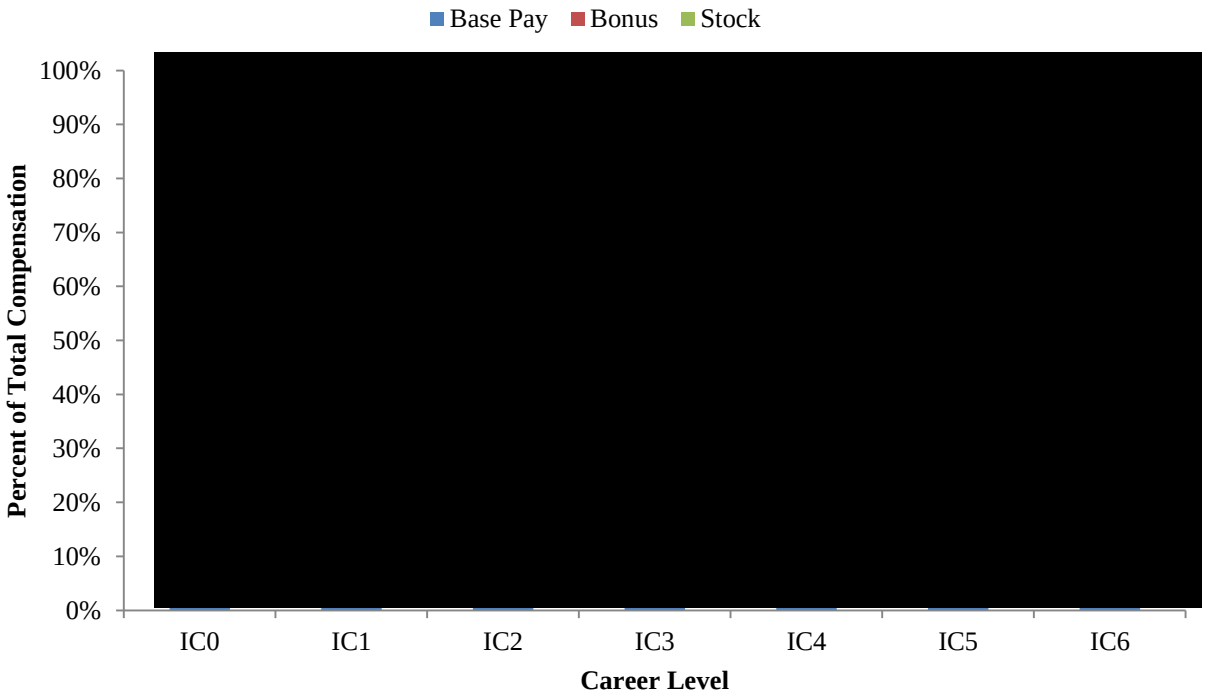
In the Individual Contributor Career Levels, Total Compensation is Comprised [redacted]

- 2013-2018, Full Time Full Year Employees, Individual Contributors By Career Level -



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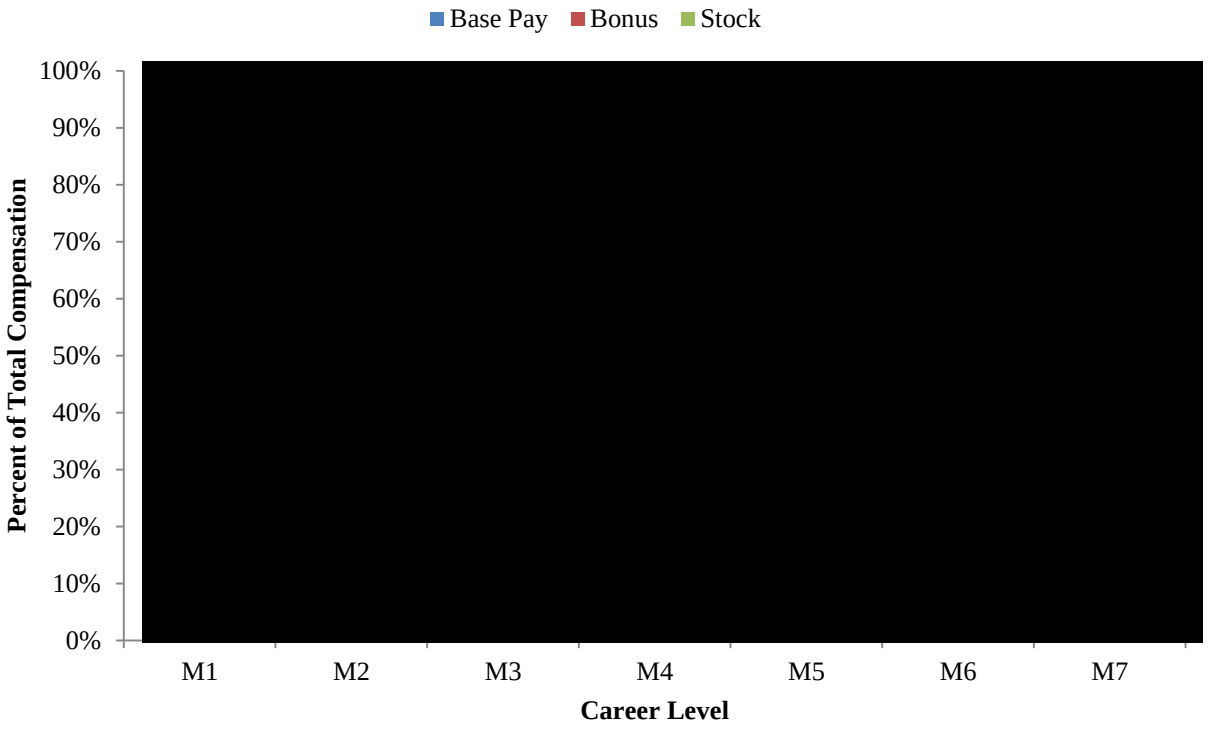
At Higher Manager Career Levels, [redacted] Bulk of Total Compensation

- 2013-2018, Full Time Full Year Employees, Managers By Career Level -



127. In PRODEV, which comprises 85% of employees covered by the OFCCP's allegations, there are no statistically significant differences in total compensation. In SUPPORT, women earn more or less than men depending on the year, with just one year showing a statistically significant adverse outcome for women. The statistical results for ICs in INFTECH stand in contrast to both PRODEV and SUPPORT when the same regression model is applied. The majority of the annual differences are negative and statistically significant. This is likely an indication that a meaningfully different regression model applies to INFTECH as compared to the other two job functions. Taking the findings of all job functions together does not support an inference of a consistent pattern of discrimination against women.

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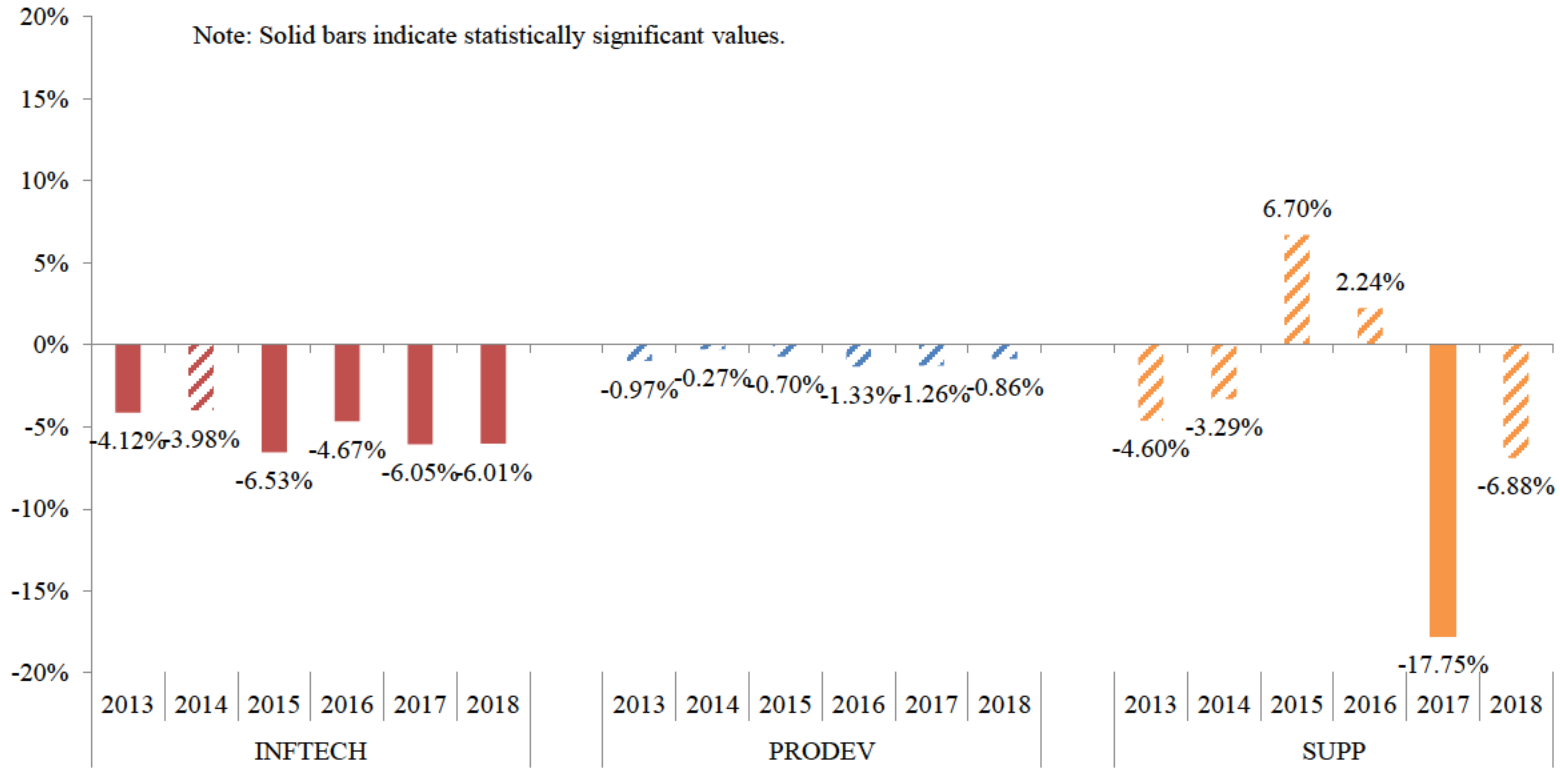
Modified Regression Analysis of Total Compensation Shows No Systematic Pattern of Statistically Significant Results for Women vs. Men in IC Career Levels Across Years or Job Functions



Model controls for female, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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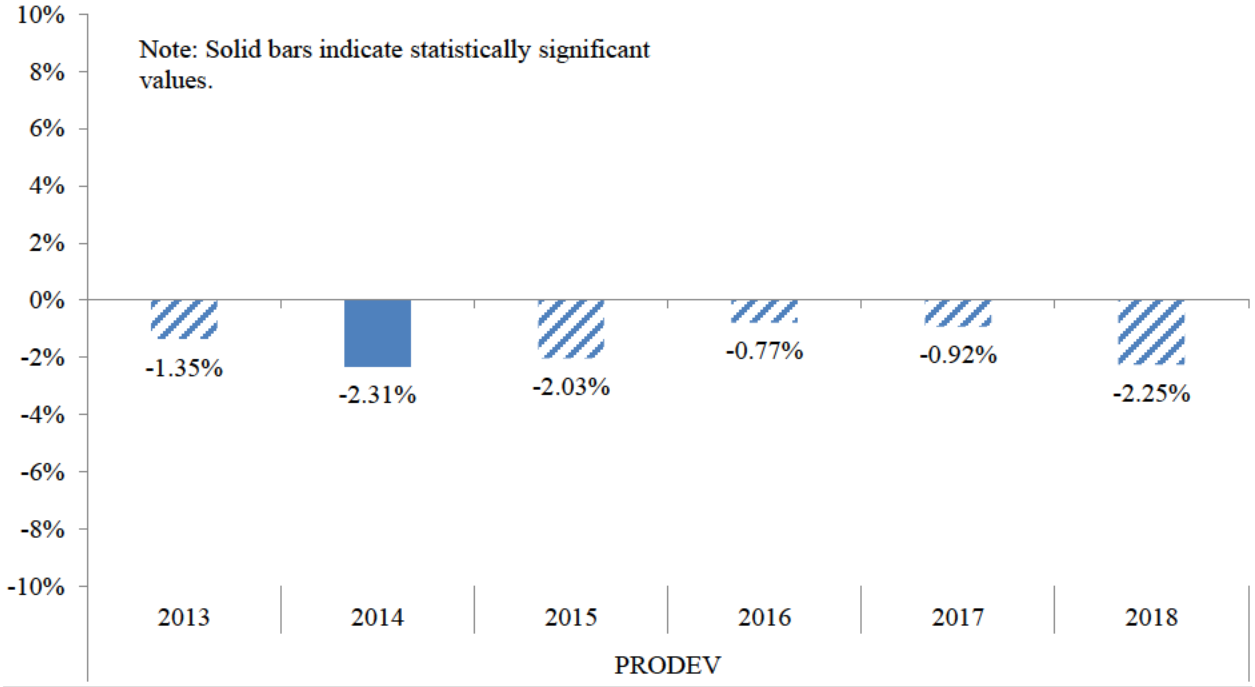
128. The same regression model was used to analyze pay disparities between Asians, African Americans and Whites in the IC track of the PRODEV job function. There is a statistically significant difference in total compensation between Asians and Whites in only one of the six years in the data. The results for African-Americans do not show any statistically significant disparity on average compared to Whites in any year. As was true for women, the data for race as a whole do not support a hypothesis that Asian or African American IC career path in PRODEV employees are systematically adversely affected by pay discrimination.

Modified Regression Analysis of Total Compensation Shows No Systematic Pattern of Statistically Significant Results for Asians vs. Whites in IC Career Levels Across Years Within PRODEV



Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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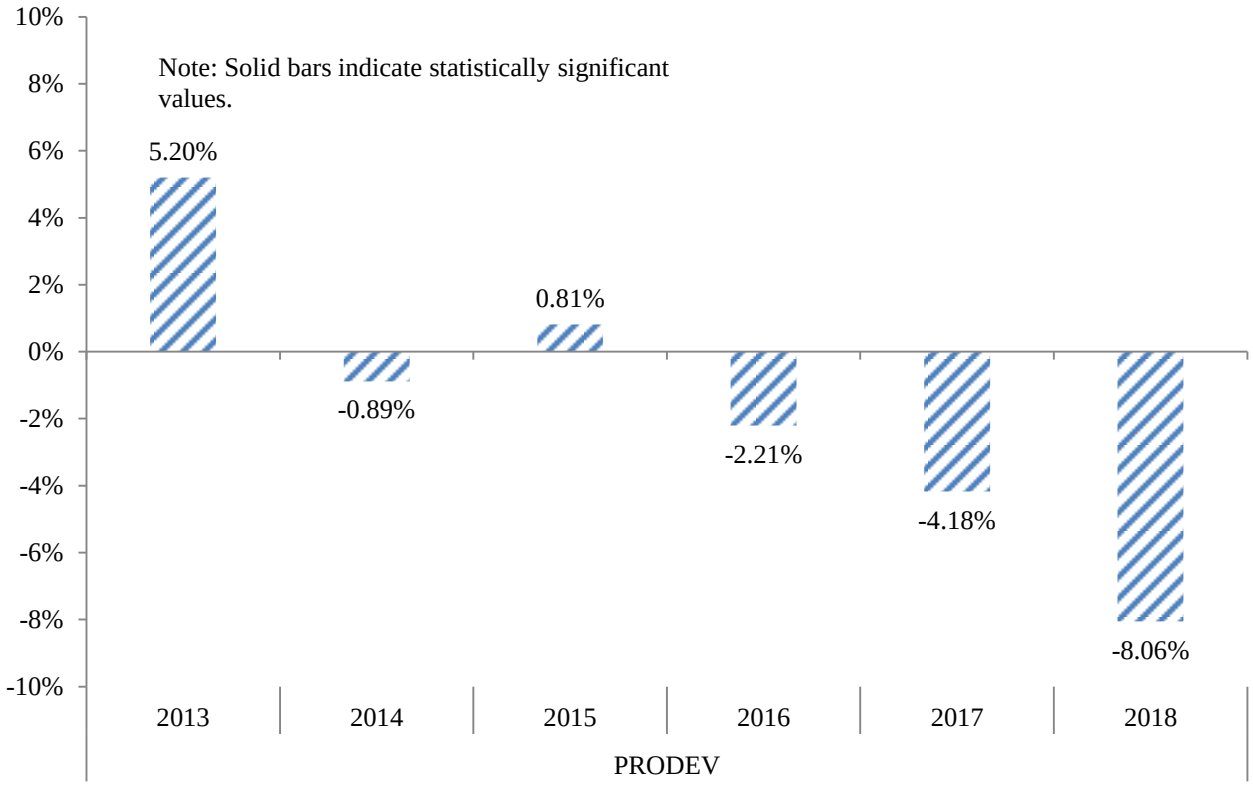
Modified Regression Analysis of Total Compensation Shows No Statistically Significant Results for African Americans vs. Whites in IC Career Levels in Any Year Within PRODEV

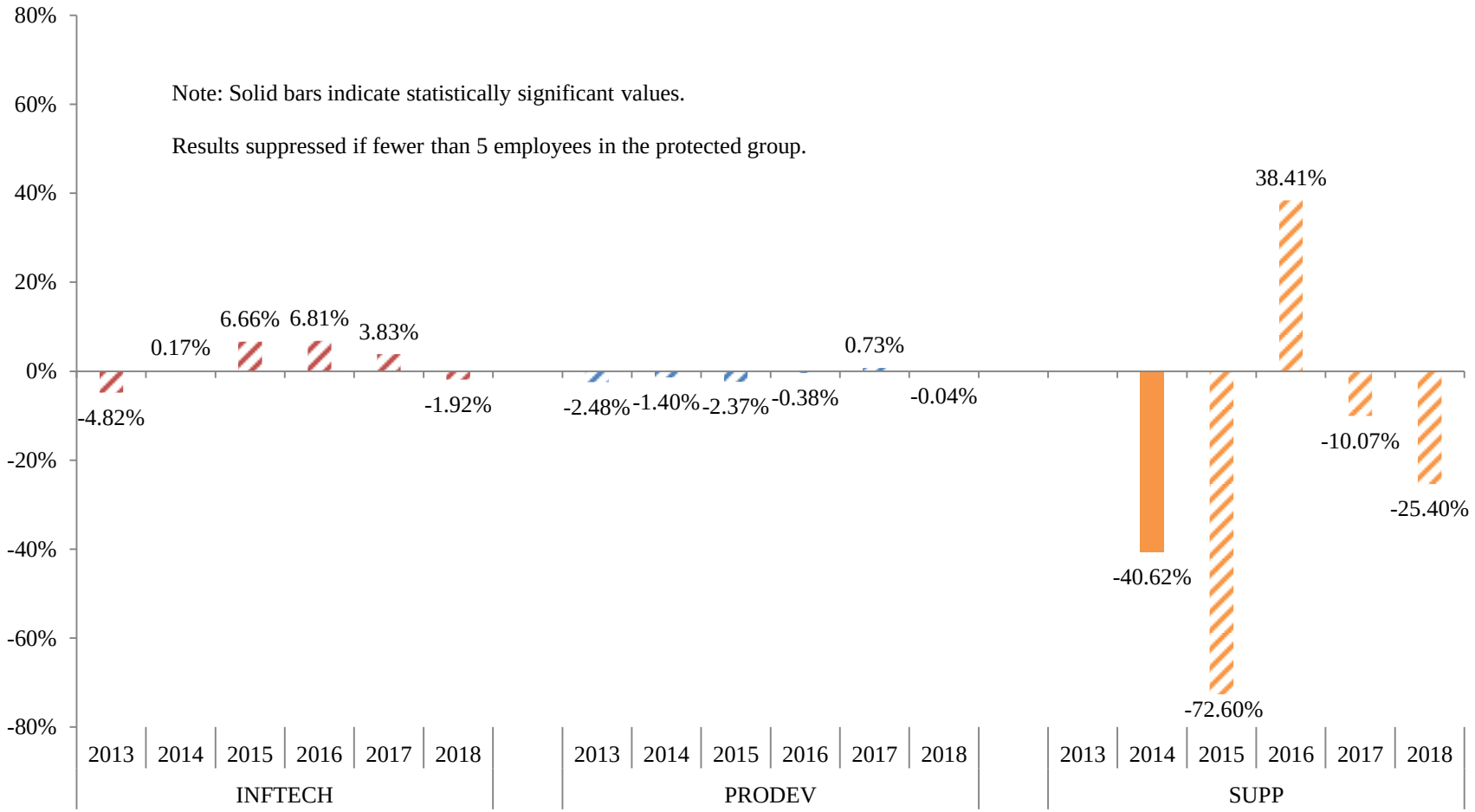


Model controls for African American, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

129. When the regression model is estimated by job function, employees in the Managerial Career Levels, the results show a mix of positive and negative by gender and race coefficients which are statistically insignificant.[102] The one statistically significant coefficient is negative, for women in the SUPPORT job function in 2014, but in INFTECH in the same year, the coefficient is positive. Among Asians compared to Whites, there is also a mix of positive and negative results on average, none of which are statistically significant. I conclude that the data for IC and Manager employees do not support a hypothesis that women and Asian managers are being discriminated against in pay at Oracle.

[102] There are fewer than 5 African American managers and so these results are not shown.

Modified Regression Analysis of Total Compensation Shows No Systematic Pattern of Statistically Significant Results for Women vs. Men in M Career Levels Across Years or Job Functions



Model controls for female, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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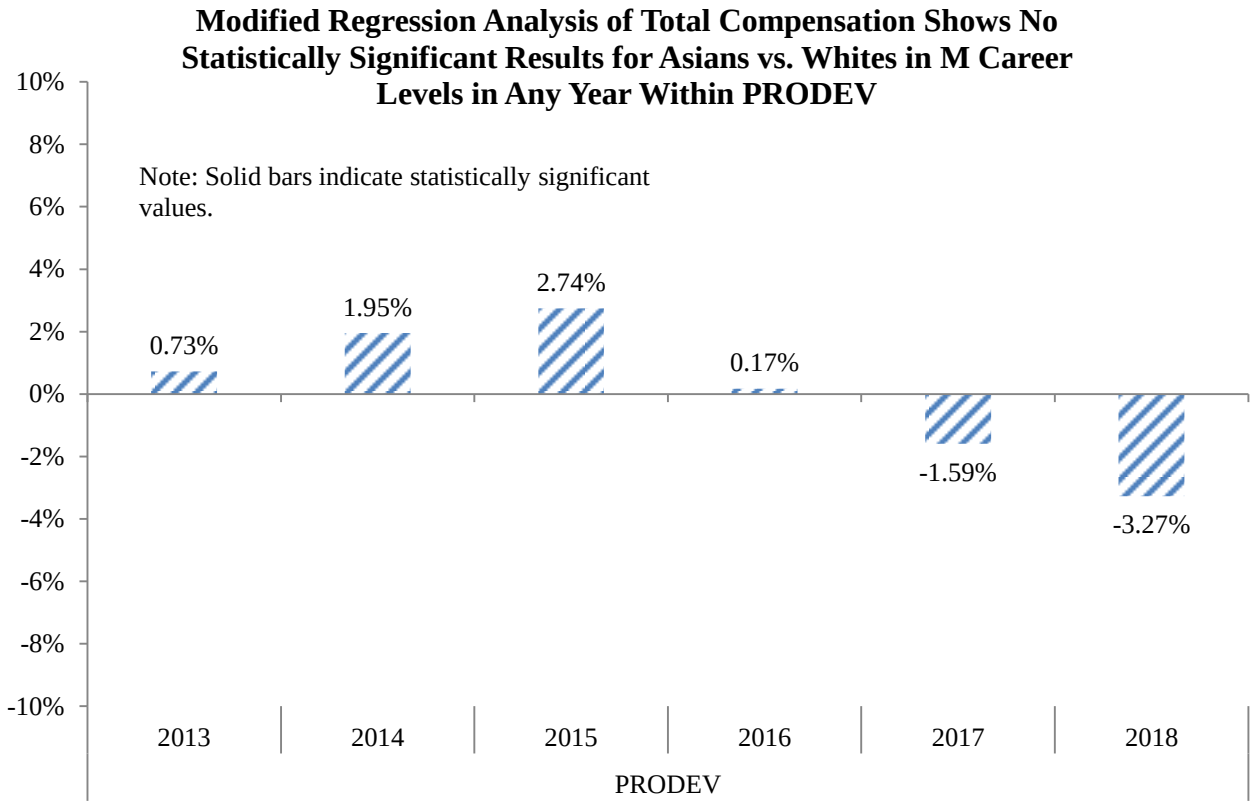


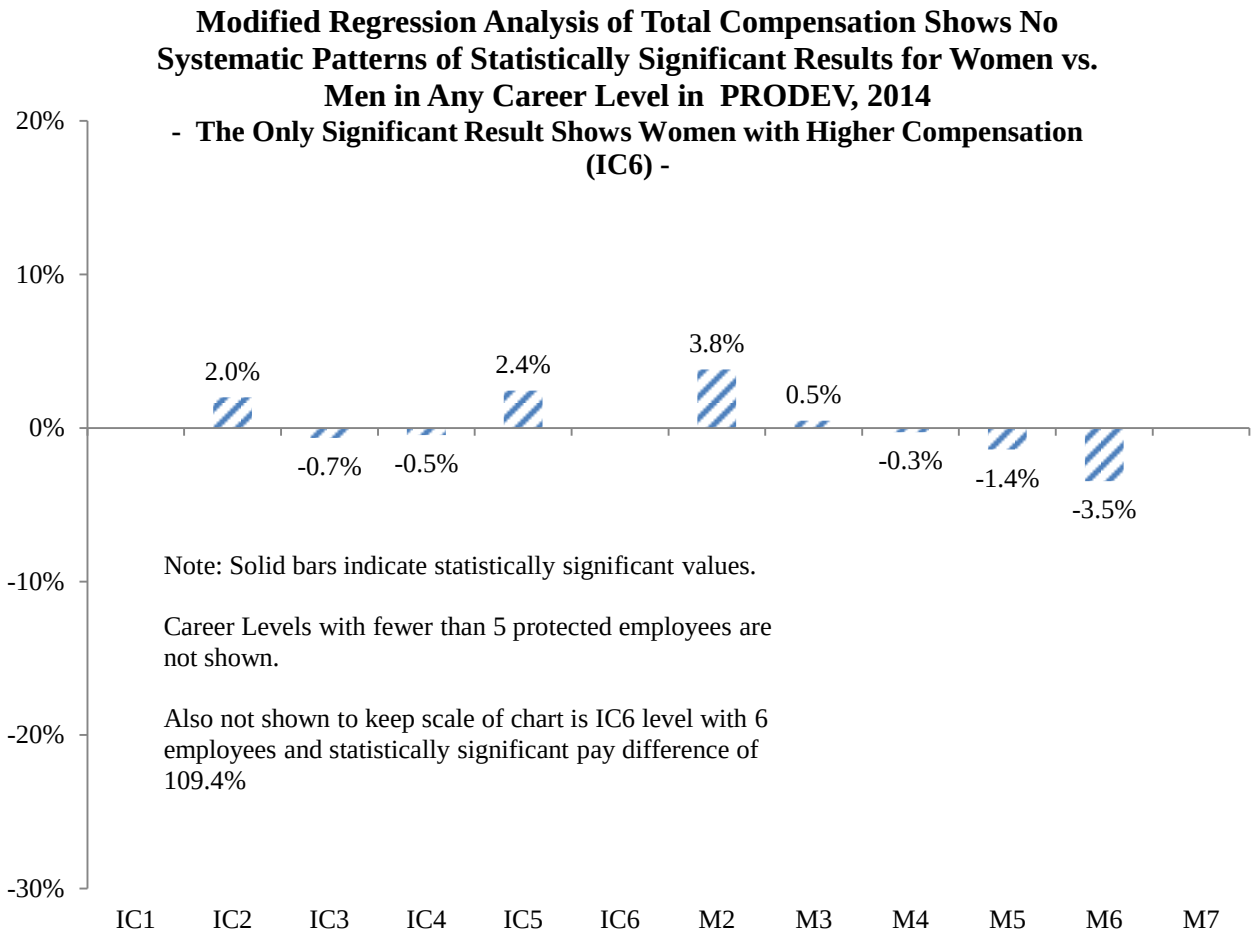
Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

<u>These results do not show any pattern by Career Level</u>

130. The OFCCP claims that pay differences widen with tenure.[103] In the PRODEV job function, there are enough employees to support a regression analysis by Career Level in 2014.[104] Among women, there is one positive statistically significant coefficient (in IC6[105]) and four other levels have a positive result. Asians also have a mix of positive and negative coefficients that are not statistically significant and

[103] SAC, paragraphs 26-28.
[104] If a Career Level has fewer than 5 protected group employees, the result is not shown.
[105] In order to maintain the scale of the graph, this result that women are paid 109.4% more is not depicted in the chart.

African Americans have negative but not statistically significant coefficients. These results show that there is no statistically significant pay disparity at lower career levels that widen at higher levels.



Model controls for female, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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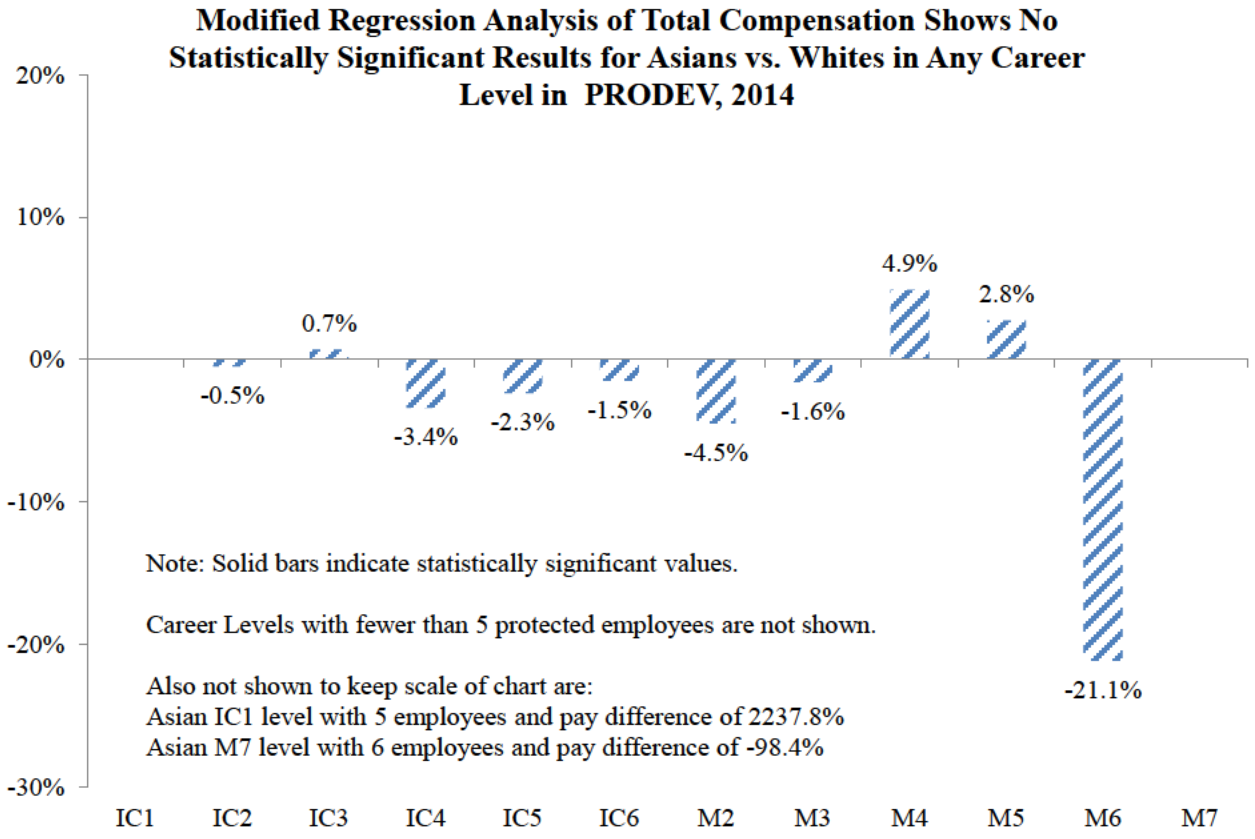

Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

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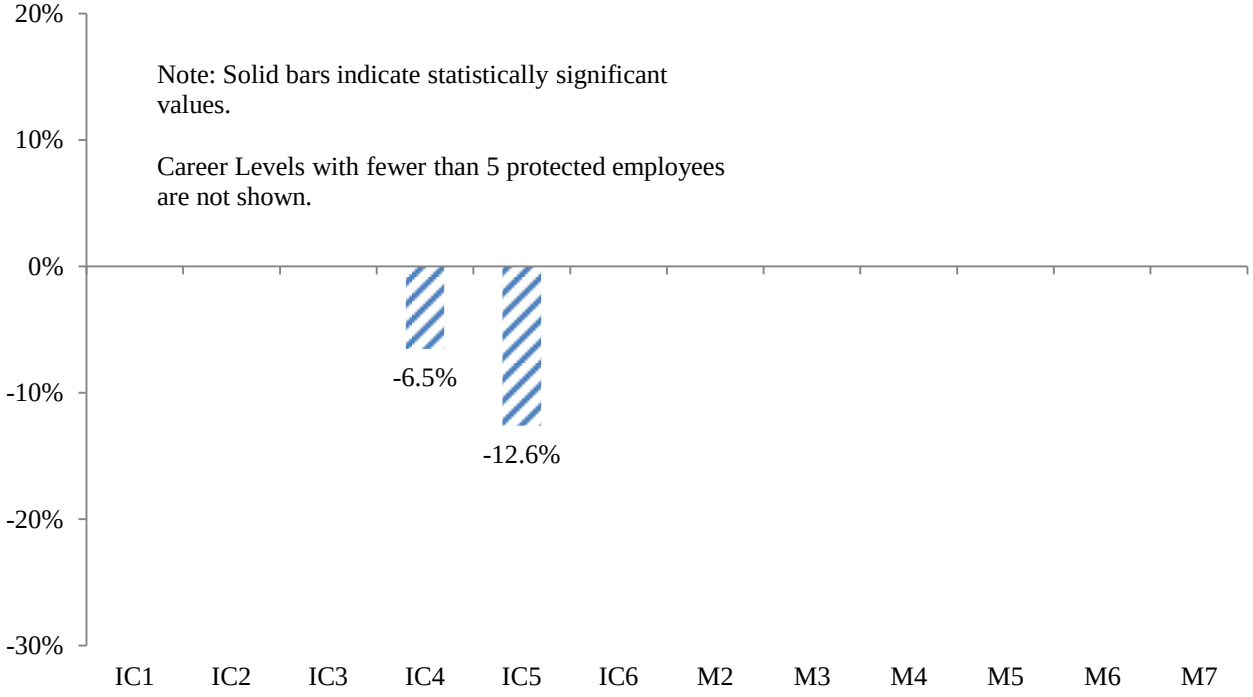
Modified Regression Analysis of Total Compensation Shows No Systematic Patterns of Statistically Significant Results for African Americans vs. Whites in Any Career Level in PRODEV, 2014



Model controls for African American, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

131. More generally, the OFCCP analysis of tenure groups compares apples and oranges. In their analysis, the pay gap for those with 1 to 3 years of tenure is smaller than the one estimated among employees with 7 to 9 years of tenure. They interpret this to mean that the pay gap opens up over time. However, the tenure groups do not follow the same individuals over time but rather are comprised of different cohorts who entered Oracle under different market conditions. For example, the 7 to 9 tenure group includes employees whose original hire date was prior to the year 2000, though most in this cohort were hired in the 2007 to 2009 recession. The career trajectories of those hired during a financial crisis are being compared to employees who were hired after 2013 under very different market conditions and demands. Economists have studied the career impact of recessions on careers, concluding that the

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"match" between employers and employees tends to be lower during recessions, with long term earnings implications for those hired.[106]

132. In order to analyze patterns over time as employees' tenure rises without mixing very different cohorts of employees whose experiences could differ markedly, I limit the data to new, non-acquisition hires between 2013 and 2016 and follow the same group over time. I observe the pay difference amongst these groups of employee at the end of their first full year-end, second year-end, and so on up to four years after hire. None of the total compensation differences are statistically significant or suggest that women at Oracle fare worse with respect to total compensation relative to men the longer they are at Oracle. In fact, the results vary from year to year and I find a positive coefficient for women at the end of year four. Contrary to the conclusions of the OFCCP, these results do not support their conclusion that a male-female pay difference widens with tenure.

Modified Regression Analysis of Total Compensation Over Time Shows No Statistically Significant Results for Females vs. Males in Any Years Since Hire

- New Hires in PRODEV, SUPP, and INFTECH Between 2013 - 2016, by Years Since Hire -

Years Since Hire	# Protected Group	Pay Difference (%)	T-Value
First Year of Hire	349	-1.54%	-1.22
Second Year of Hire	290	-1.47%	-1.02
Third Year of Hire	158	-2.33%	-1.13
Fourth Year of Hire	85	1.54%	0.43

Model controls for female, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time non-US Oracle affiliates), age minus total Oracle tenure minus 22, cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire, and year.

133. The same is true in my analysis of newly hired Asians. None of the total compensation differences are statistically significant or suggest that Asians at Oracle fare worse with respect to total

[106] See for example, Oreopoulos, Philip, Till von Wachter, and Andrew Heisz (2012) "The Short- and Long-Term Career Effects of Graduating in a Recession." *American Economic Journal: Applied Economics*, 4 (1): 1-29.

compensation relative to Whites the longer they are at Oracle. Contrary to the conclusions of the OFCCP, these results do not support their conclusion that pay disparities for Asians widen with tenure.

Modified Regression Analysis of Total Compensation Over Time Shows No Statistically Significant Results for Asian vs. White in Any Years Since Hire

- New Hires in PRODEV Between 2013 - 2016, by Years Since Hire -

Years Since Hire	# Protected Group	Pay Difference (%)	T-Value
First Year of Hire	1,096	-0.14%	-0.07
Second Year of Hire	902	-4.24%	-1.92
Third Year of Hire	527	-1.84%	-0.58
Fourth Year of Hire	282	-3.67%	-0.73

Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at non-US Oracle affiliates), age minus total Oracle tenure minus 22, cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire, and year.

Visa holders are paid the same as other employees, contrary to the OFCCP claim

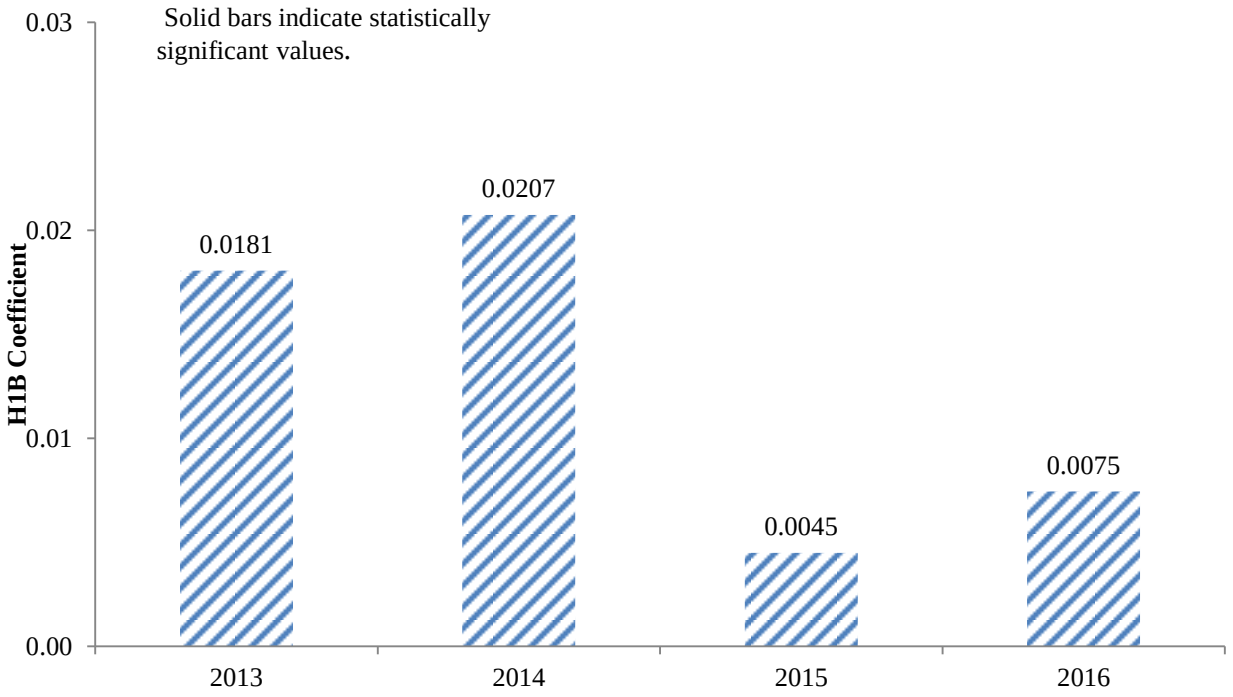
134. The OFCCP has expressed concern that Oracle prefers to hire employees on work visas as a source of less expensive labor. "This strong preference for a workforce that is dependent on Oracle for authorization to work in the United States contributes to Oracle's suppression of Asian employees' wages."[107] They did nothing to study this claim, but I examined the impact of having held an H1-B visa on pay for Asians in PRODEV.[108] On the whole, I find that the coefficient is small and positive (but

[107] SAC, paragraph 39.

[108] I limit the analysis to PRODEV because that is the job function in which the OFCCP claims there is a pay disparity for Asians. H1B status is only contained in the data for 2013-2016, and so these regression models are restricted to those years. As in the earlier modified total compensation regression models, I also control for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition,

statistically insignificant). The OFCCP claim regarding the visa-holding workforce is unsupported by the data.

Modified Regression Analysis of Total Compensation for Asians vs. Whites in PRODEV Shows No Statistically Significant Effect of H1B Status



Note: The coefficient is never statistically significant. Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, whether they arrived at Oracle as an experienced hire or through an acquisition, and whether on H1B visa.

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THE OFCCP ANALYSIS OF STARTING PAY IS UNRELIABLE AND BIASED DUE TO KEY OMITTED VARIABLES

The OFCCP starting pay model considers everyone in a Career Level equivalent in terms of skills and responsibilities

135. The OFCCP claims that female and Asian employees (but not African Americans) were discriminated against in terms of starting pay.[109] But the models the OFCCP uses to test this claim control for Career Level and not standard job title. This means that for all intents and purposes, all jobs in a Career Level are considered equivalent in terms of skills and responsibilities. Employees sharing a Career Level are expected to have a certain level of expertise in their area, but that would certainly not translate into their being similarly situated enough that one would expect them to earn the same. Recall the enormous range in pay within Career Levels I discussed earlier. To use an analogy from an academic employment setting, an Associate Professor of English, an Associate Professor of Physics, and an Associate Professor of Business all share a career rank, but their pay scales tend to be quite different because they have different skills, different non-academic opportunities, and different abilities to attract students paying full tuition.

136. Oracle managers hire employees from varied sectors of the economy, but they are especially concerned with remaining competitive with the "premier" firms in the industry.[110] This means that jobs are mapped to salary ranges based on external surveys that track compensation.[111] Even within a career

[109] SAC, paragraph 22.

[110] For example, in 2011, these included Adobe, Apple, Applied Materials, Cadence, Cisco, Ebay, Google, HP, IBM, Intel, Microsoft, Motorola, Qualcomm, SAP, Texas Instruments, and Yahoo! (ORACLE_HQCA_0000364272_native.pptx, p. 7)

[111] "Our primary sources of data come from highly reputable 3rd party consulting firms who gather data from participants, and compile it to produce reports that keep individual company data confidential. Oracle targets to be competitive against a select list of competitor companies chosen by our board of directors. These are the companies the board feels are our biggest competitors for talent – those that we hire from, and lose employees to. It is not an exhaustive list, rather the most prominent companies only, and those that are felt to be the "premier" high tech market sector." (ORACLE_HQCA_0000364272_native.pptx, p. 7)

level, positions do not all map to the same salary scale.[112] For example, in FY2014, the base salary ranges for Project Manager 3s (Career Level IC3) was [redacted][113] For Software Developer 3s in the same year and same Career Level, the base salary range was set from [redacted].[114]

137. All of the Career Level IC4 positions in the table below share a career level, but the high-level standard job descriptions make it clear they draw on different skills, and the average starting pay in those positions varies considerably. Average starting pay for Hardware Developer 4s was [redacted] Applications Developer 4s and [redacted] Technical Writer 4s. Yet the OFCCP model assumes they all have similar skills, and that the supply of those skills by potential employees as well as the demand for those skills by other companies are all the same.

Average Starting Pay and High-Level Descriptions of Job Titles in Career Level 4 in PRODEV		
Standard Job Title	**High-Level System Job Description**	**Average Starting Pay 2013-2018 (in $2014)**
Hardware Developer 4	Evaluates reliability of materials, properties and techniques used in production; plans, designs and develops electronic parts, components, integrated circuitry, mechanical systems, equipment and packaging, optical systems and/or DSP systems.	[redacted]
Software Developer 4	Design, develop, troubleshoot and debug software programs for databases, applications, tools, networks etc.	[redacted]
Program Manager 4	Manage the development and implementation process of a specific company product.	[redacted]
User Experience Developer 4	Responsible for creating, evaluating and modifying prototypes to support evolving hardware and software application development.	[redacted]

[112] "Salary ranges assign a minimum and maximum to the amount that we are willing to pay for a specific job. They reflect the market in the area and allow for much variation in knowledge, skills & abilities that each individual brings to the company." (ORACLE_HQCA_0000364272_native.pptx, p. 4)
[113] ORACLE_HQCA_0000581471.xlsx.
[114] ORACLE_HQCA_0000581471.xlsx.

Applications Developer 4	Analyze, design develop, troubleshoot and debug software programs for commercial or end user applications. Writes code, completes programming and performs testing and debugging of applications.	[redacted]
QA Analyst 4	Responsible for developing, applying and maintaining quality standards for company products with adherence to both internal and external standards. Develops and executes software test plans. Analyzes and writes test standards and procedures. Maintains documentation of test results. Analyzes test results and recommends corrective actions.	[redacted]
Technical Writer 4	Creates, develops, plans, writes and edits operational, instructional, maintenance, test or user manuals for paper, multimedia or web-based publications. Contributes to the timely design, production and delivery/completion of product documentation and document sets.	[redacted]

138. Not only does the OFCCP model ignore very real differences in the jobs in a Career Level, it also ignores the evidence that not all positions sharing a standard job title call on the same skills and experiences.[115] Employees working on cutting edge projects will tend to earn more, all else constant, than employees working on legacy products in well-established markets. This in turn implies that the specific skills someone has are relatively more important than just years of general work experience. In the data, one would expect to see that starting pay has less to do with generally defined experience (which the OFCCP model defines as age of hire at Oracle America, Inc. minus 18) and more to do with particular skills.[116]

[115] "[…] just as the technologies themselves differ, so do the skills, duties and responsibilities needed to develop, enhance, modify, support or service those products and services. This can be true whether or not employees share the same job title. A developer who works on Middleware or Infrastructure generally needs familiarity (to differing degrees) with how the underlying hardware functions; a developer working exclusively on Applications, by contrast, may work at a level far removed from the hardware and thus may not need that same knowledge, although she would need to be familiar with other tools and techniques to develop and shape the software that creates that interface that the end user sees and works within." Miranda declaration, paragraph 3. (ORACLE_HQCA_0000607281.pdf)

[116] "Because not all products and services have the same value to Oracle, the value of the skills, duties, and responsibilities necessary to develop, enhance, or service Oracle's wide array of products and services also differs and changes over time. […] As technology continually changes and develops, the competition and market demand for employees skilled in the latest technologies also changes, meaning

139. The charts below depict the relationship between starting pay and age for experienced hires in Software Developer 3s and 4s, large standard job titles in the data. New Software Developer 3s between the ages of 30 to 35 earn between [redacted] in starting base pay, while those between the ages of 45 and 50 earn from [redacted] The relationship between pay and age is relatively flat, such that there does not appear to be a premium for having had more years of general non-Oracle work experience. Among Software Developer 4s, those aged 30 to 35 earn from [redacted] in base pay and those between the ages of 45 and 50 earned [redacted]. Again, the scatterplot is relatively flat, rather than rising from the lower left portion of the chart to the upper right: there is no strong relationship between starting pay and years of general non-Oracle experience. This suggests that starting pay is influenced by something other than general years of experience. The other feature of interest in these two charts is that pay ranges at Oracle are far from being narrowly prescriptive, lockstep pay bands. While average Career Level 4 pay is higher than that of Career Level 3, it is possible for someone hired into [redacted]

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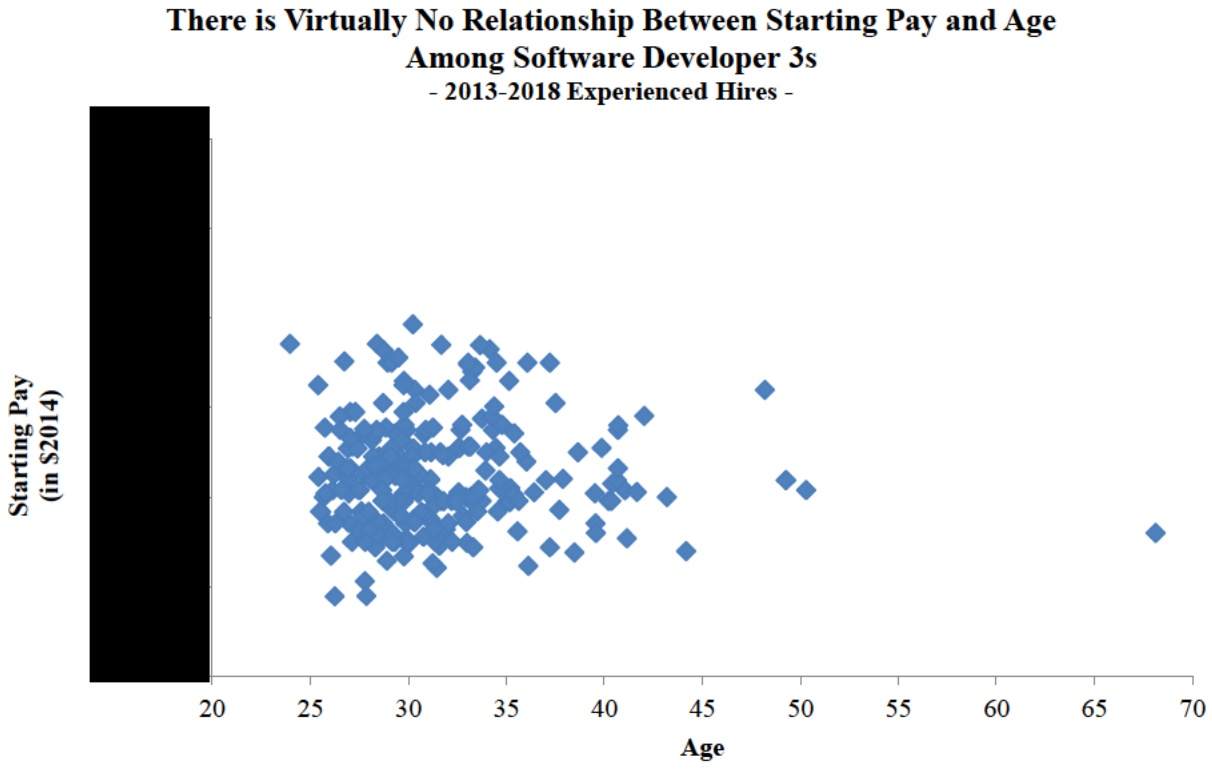
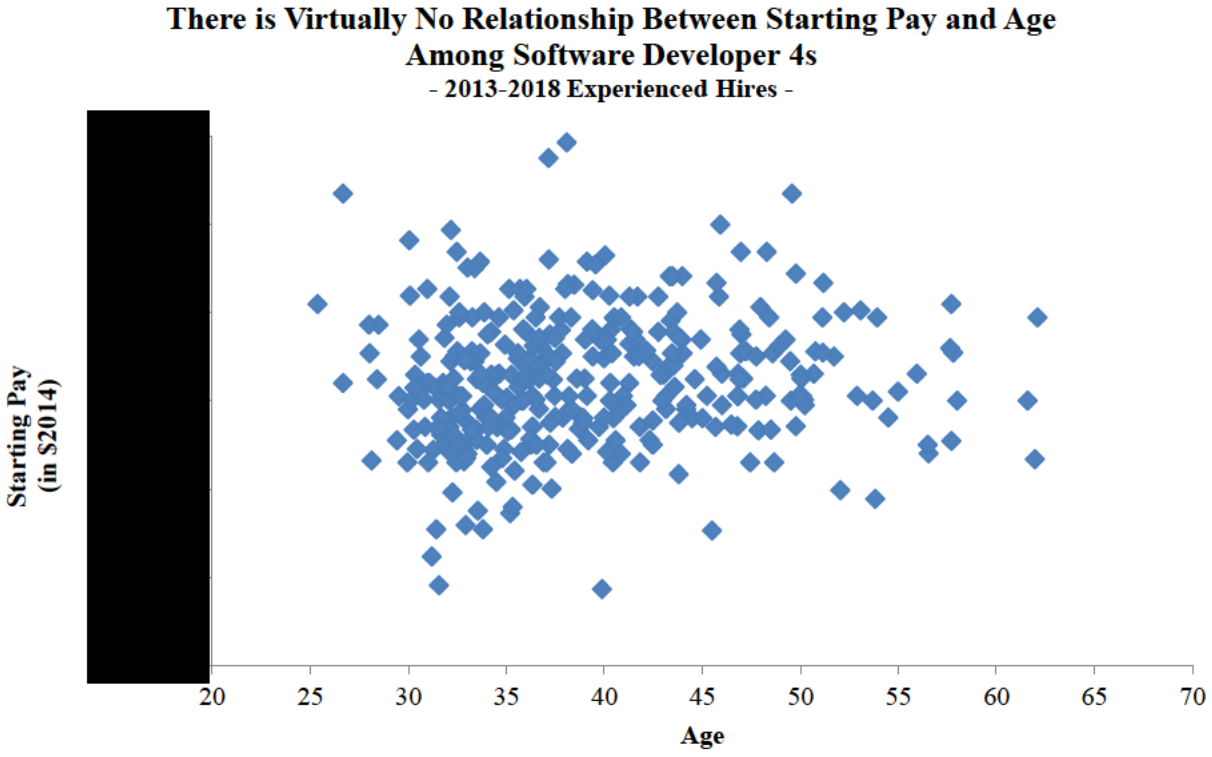
the value to Oracle of various skills, duties and knowledge also fluctuates over time." Miranda Declaration, paragraph 7. ORACLE_HQCA_0000607281.pdf)





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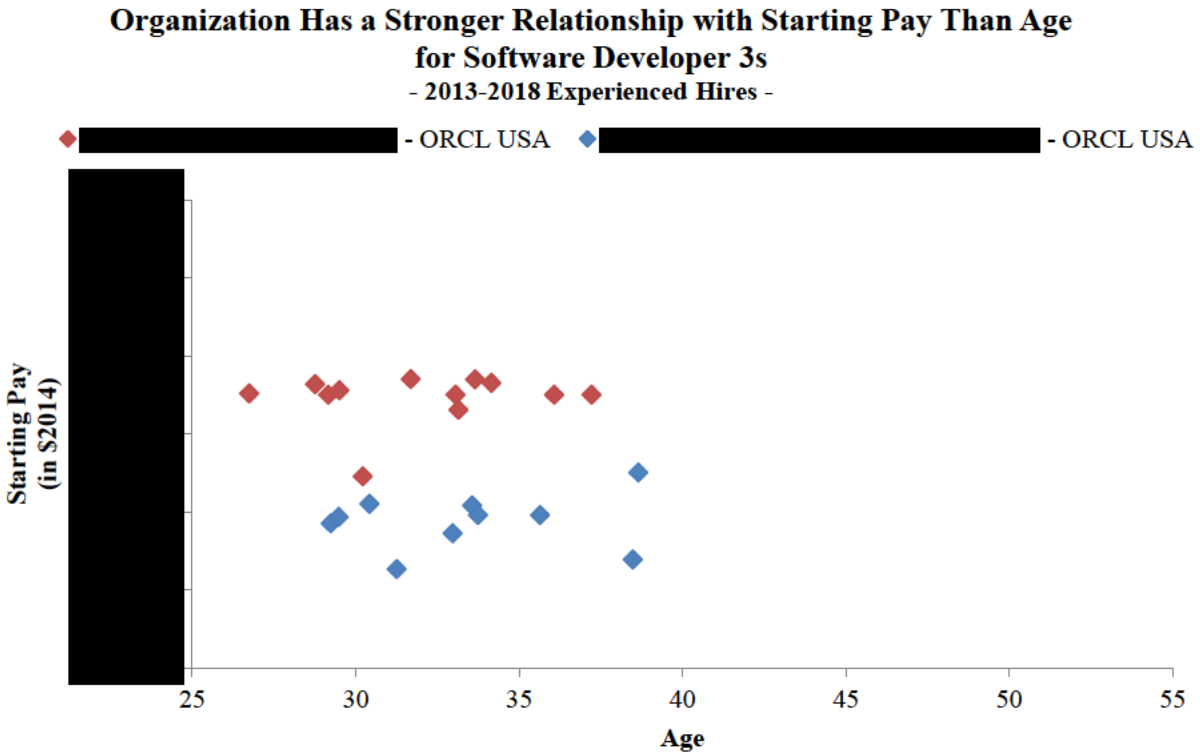
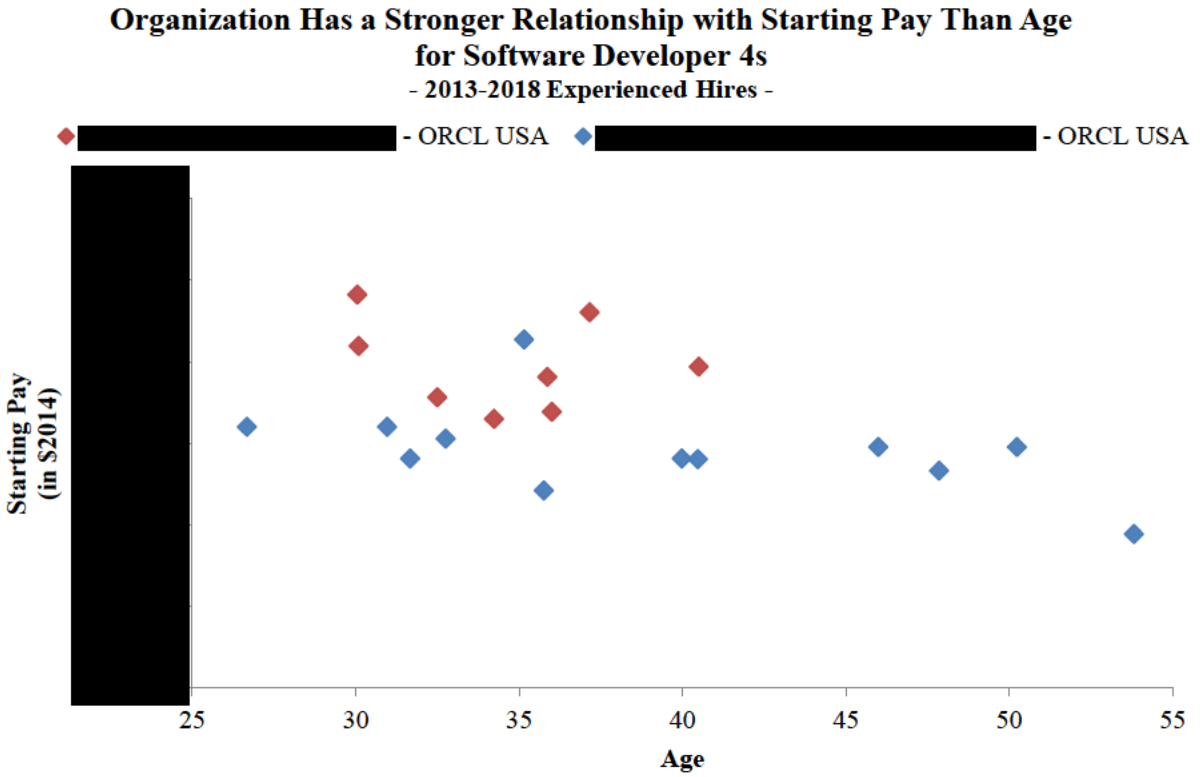
140. The patterns in the scatterplots suggest that very specific skills and experiences, rather than general years of experience or broad categories of skill, explain initial placement and starting pay that ranges from [redacted]. Standard job title alone does not distinguish between employees in the kinds of skills required, never mind the far broader Career Level used by the OFCCP in its model.

141. One factor to consider is the types of products employees work on.[117] Product data is not available, but the variable "organization" is a rough proxy for the projects and services employees work on – it is at least more informative than standard job title alone – and can be used as a way to better group employees likely to have more similar skills and prior work backgrounds. For example, in the charts below for Software Developer 3s and 4s, new hires into the "Oracle Labs" research and development organization tend to [redacted] than those in the "Corp Architecture – Development" organization supporting technologies for high speed data transfer.[118]

[117] When asked who are regarded as peers in making internal equity pay comparisons, Kate Waggoner replied "[…] when we talk peers, we really mean doing the same – the same role working on the same product. It's not – it doesn't come to job code or title because, as I said, those are incredibly general. We have to get down a little bit more granular to say, oh, this is our group of people with the hot skill working on AI today. Those are considered the peers, not people in the same job code but developing PeopleSoft." Waggoner May 1, 2019 deposition, 93:13-22.

[118] According to the Department Description field in the iRec recruitment database, Oracle Labs "is **researching advanced technologies** in systems, architecture, compilers, programming languages and databases " and "Oracle Labs is the sole organization at Oracle that is devoted exclusively to research." The department descriptions for Corp Architecture positions read, "The OVM infiniband group **provides support** for Mellanox OFED in Oracle Linux, Oracle VM and engineered systems." (ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx) (https://www.openfabrics.org/ofed-for-linux/)





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142. Given the differences even within standard job titles and organizations, there is no reason to believe that everyone sharing a Career Level should earn the same, meaning that the OFCCP's decision to control only for Career Level in their starting pay models is incorrect because it does not compare similar employees from a labor economics perspective.

Prior pay is highly correlated with starting pay in all firms, not just at Oracle, because both pay sources are a function of the skills, experience and responsibilities of the employee

143. The OFCCP also claims that their "preliminary analyses" show that the disparities they claim to have found in starting pay were "due, in part, to Oracle's reliance on prior salary in setting compensation […]."[119] The back-up material they produced to support their claims does not contain any analysis of prior pay, however. Such an analysis to show how prior pay causes disparities in starting pay is actually quite difficult. A regression coefficient is a measure of correlation, in that it indicates a relationship between two variables but does not necessarily show causality. One can regress height on shoe size, but the positive regression coefficient should not be interpreted to mean that as feet grow longer in length they cause the person to be taller. Showing that prior pay and starting pay are correlated is not enough; the claim is a *causal* one, that reliance on prior pay causes starting pay to be lower for women, Asians, and African-Americans. The OFCCP has not provided any analysis to support this claim.

144. The difficulty with studying prior pay and starting pay is that it is difficult to disentangle how much of the correlation is due to a pay practice of Oracle specifically (as the OFCCP charges) or instead how much is due to the fact that pay depends on a person's skills, experience, and how in demand those attributes are by competing companies. Starting pay and prior pay are strongly correlated throughout the economy. I reviewed National Longitudinal Survey (NLS) data on prior pay and starting pay for people who changed jobs.[120] The correlation between starting pay and prior pay is 0.75 across all individuals in

[119] SAC, paragraph 32.

[120] The National Longitudinal Surveys (NLS) started in 1997 with 14-18 year olds and surveys them every year about a wide range of topics. My analysis examines job changes and the difference between the ending pay of the prior job and the starting pay of the new job. After limiting the data to exclude people changing occupation, changing part-time/full-time status, or who have extreme values of the reported hourly rates, I analyze data for 3,488 respondents.

the NLS, meaning that it is a factor economy-wide and not just at Oracle. According to the OFCCP's theory, if prior pay has embedded within it labor market bias against women and/or Asians, then Oracle must have simply embedded that bias in its own initial pay for its female and/or minority employees. But that conclusion does not follow, because the OFCCP's hypothesis is also consistent with Oracle setting pay based on the specific relevant skills, abilities, and job experience an applicant brings to the position. The OFCCP does not provide any empirical support for their essentially assumed explanation.

The OFCCP inappropriately aggregated its starting pay analysis across very different hiring and pay-setting processes

145. The OFCCP claims that Asians and women (though not African-Americans) were adversely treated from the start by lowering their starting pay. From 2013 through 2018, Oracle hired 2,819 new employees across the three job functions at HQCA.[121] 76% percent were experienced hires, who responded to requisitions for posted positions. Another 24% were hired from colleges and universities, and less than 1% (7 individuals) joined Oracle when their company was acquired at HQCA during the period studied. The OFCCP analysis combined all new employees regardless of their source.

146. This aggregation combined with the OFCCP use of Career Level as a control does not make analytical sense in terms of experienced hires, because experienced hires respond to specific posted job requisitions. Someone who specializes in database storage is unlikely to apply for a position in Oracle Labs, or in Mobile Cloud Services. Without controlling for standard job title and organization applied to, the OFCCP's model compares employees who have reached a similar career level but who have a wide variety of skills, competitive outside options, and who work on very different products.

[121] The OFCCP starting pay analysis reaches back to 2003, thereby including starting pay decisions made well outside the OFCCP audit window and based only on the subset of employees hired in that window who continued to work for Oracle ten years later.

Experienced hires are not steered into career paths

147. The OFCCP claims protected groups are "steered" into lower paying jobs, and that this is one source of their lower average earnings when compared to non-protected employees.[122] To demonstrate this, the OFCCP estimated an ordered logit model to predict initial career levels, controlling for year and years of potential prior work experience (again, age at hire minus 18).[123] They found that women were less likely to be "assigned" into higher IC career levels and less likely to be "assigned" into higher M career levels. They also reported that Asians were less likely to be "assigned" into higher M career levels; they did not report – but their backup shows – that they found that Asians were *more* likely to be "assigned" to higher IC levels. And they found that African-Americans were less likely to be "placed" in higher IC levels, and none were hired into M levels. This analysis is completely wrong on its face, for several reasons.

148. The OFCCP "initial assignment" analysis does not take into account the skills and experiences of the applicants. Most new hires by Oracle from 2013 to 2018 were experienced hires. Not only do experienced hires choose what to apply for (as opposed to being "steered" as the OFCCP suggests), but the data shows that they largely are hired into the Career Level they apply for. Hiring managers have the power to hire one career level above the posted opening if a candidate is especially qualified, or to hire one level below the posted level if a candidate warrants it.[124] My analysis of the starting career level of experienced hires relative to the position they applied for shows no statistically significant differences between men and women in terms of career level adjustments at hire.

149. The OFCCP only generates the results they do because they do not account for the fact that men and women tend to apply for different positions at different career levels at Oracle, and statistically significantly so in the IC career path. The chart below has two panels. The one on the left is the

[122] SAC, paragraph 22.

[123] An ordered logit is a type of regression model that can be used when the dependent variable is not continuous but is ordinal. Pay is a continuous variable. An ordinal variable can be ranked but there is no way to measure whether the distance between the different ranks (i.e., from rank 1 to rank 2, versus rank 2 to rank 3) is equal. An example of an ordinal scale is when surveys ask respondents whether they strongly disagree, disagree, agree, or strongly agree with a statement.

[124] Kate Waggoner May 1, 2019 deposition, 82:1-5.

distribution of applications across IC levels for men and women. The blue bars show the percent of all women who applied to IC positions who applied to each IC level. The first bar on the left, for example, shows that 1.0% of female IC applicants applied to an IC1 position. The red bars show the distribution for men who applied to IC positions. The panel shows that women are more evenly divided between IC3 and IC4 applications than men, whereas men are much more likely to apply for IC4 positions than they are IC3 positions. The difference in distributions between the genders is statistically significant. The panel on the right shows the same distribution for applicants to manager positions. Though the distributions are not statistically significantly different, women are less likely than men to apply to M5 and M6. Asians and Whites also tend to apply for different level jobs, and statistically significantly so in both the IC and M career paths.

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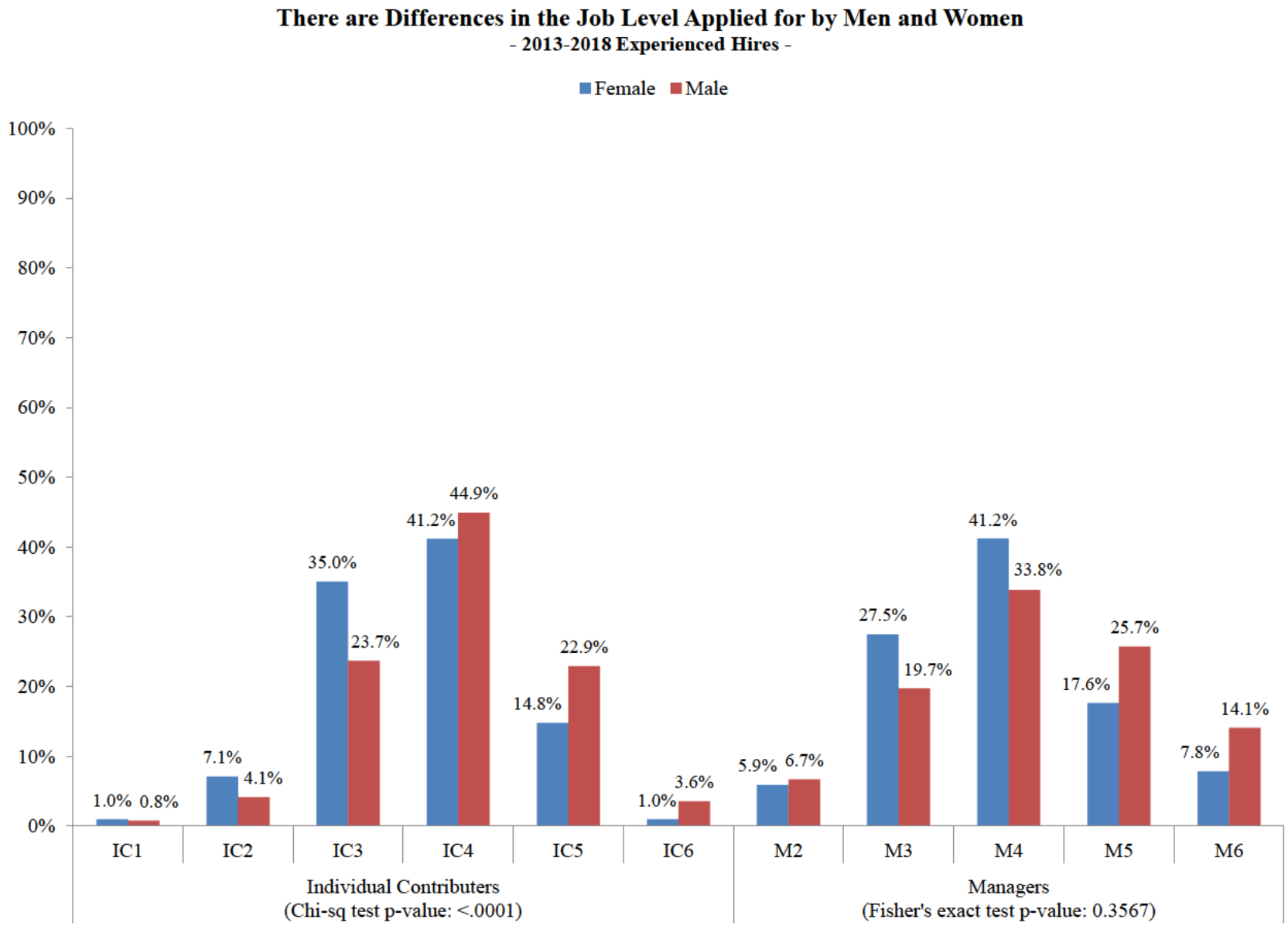

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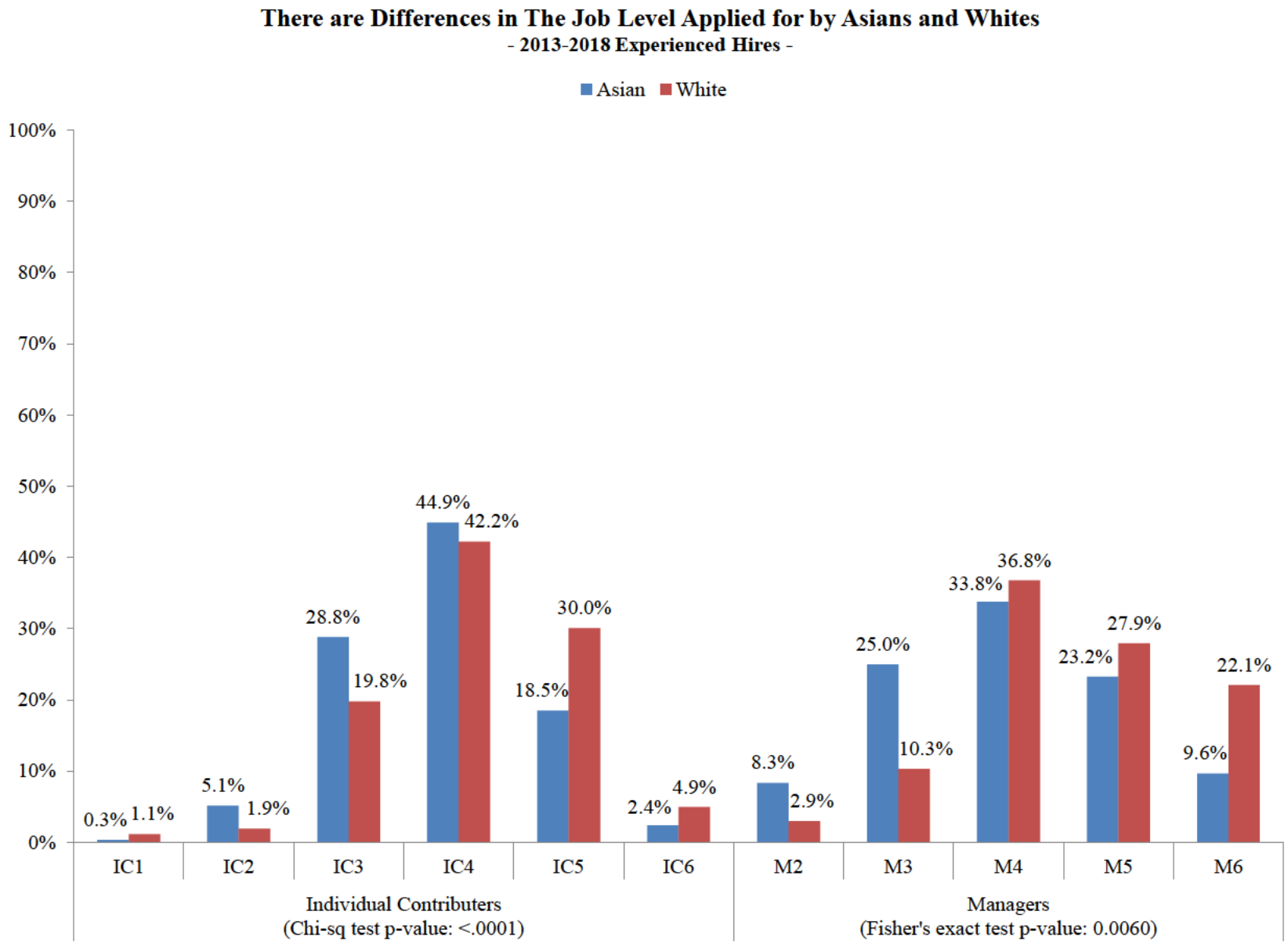

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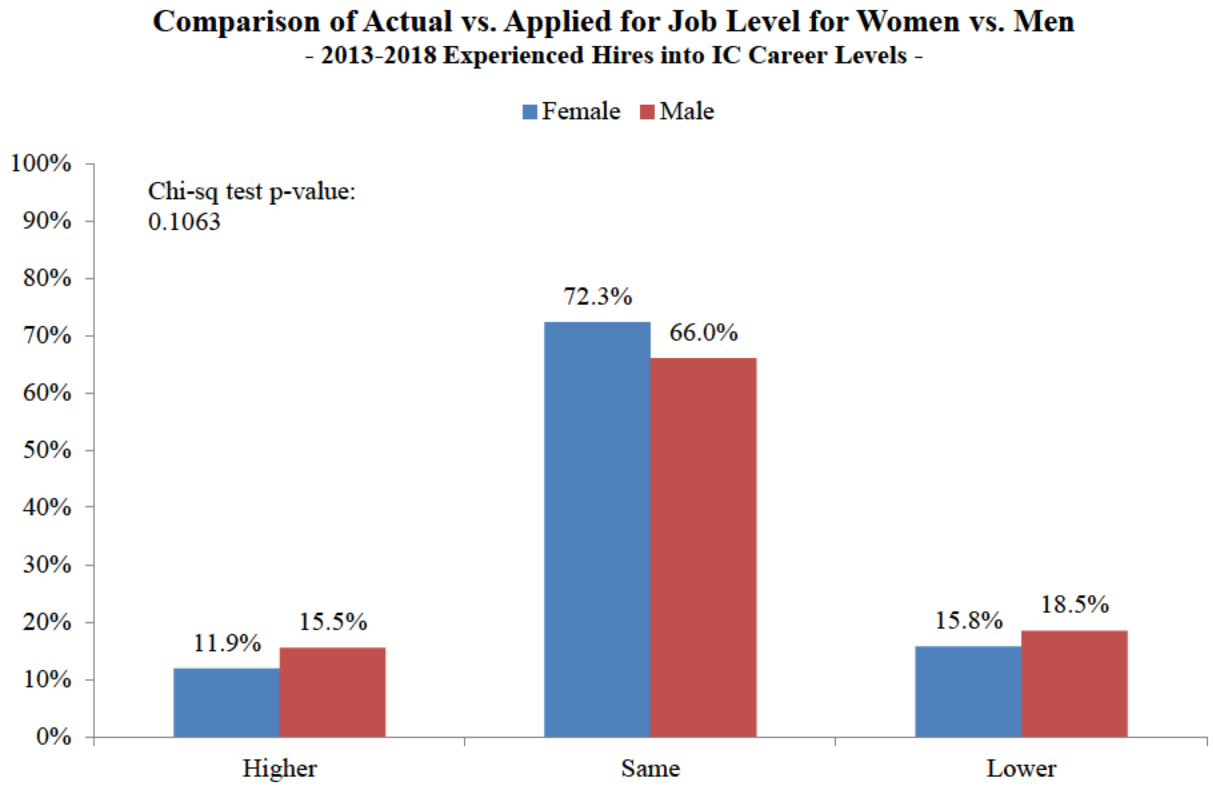
Most employees are hired into the job level they applied for

150. The OFCCP did not account for the fact that applications to IC levels differ by gender and race among experienced workers. To argue that steering is occurring, the OFCCP would have to show that Oracle systematically downgraded applicants' job level at hire relative to the position they applied for.[125] The data does not show this.

151. Instead the data show that there is no statistically significant difference between men and women in the likelihood of being placed above or below the job level applied for. Requisitions were matched to the initial standard job titles (and associated global career levels) of the new hires. For IC positions, the chart below shows that women are less likely than men to be moved up a level but also less likely to be moved down. Most women are hired into the level they applied for. The difference by gender is not statistically significant, even before taking any other factors into account such as calendar year (to take economy wide conditions into account) or age (to adopt a very rough measure of potential experience).

152. I apply the same methodology used by the OFCCP (ordered logit) to study whether individuals were hired a level up, the same level or down a level from the position to which they applied, controlling for year and age minus 22. The model confirms what the charts below show, that there is no statistically significant gender difference. Women are somewhat less likely to be moved up an IC level, but the differences are not statistically significant.

[125] Current employees seeking to transfer can apply for open requisitions, which are posted internally as well as externally. Oracle U.S. Employee Handbook, p. 45 (ORACLE_HQCA_0000000464.pdf).



153. In the management track, women are more likely to be moved up or moved down relative to men, but (as was true for IC new hires) the differences are not statistically significantly different. When I estimate the ordered logit model in order to control for year and experience, the results are the same as they were for the IC track: there are no statistically significant gender differences in the likelihood of being moved up or down a level compared to the level applied to.

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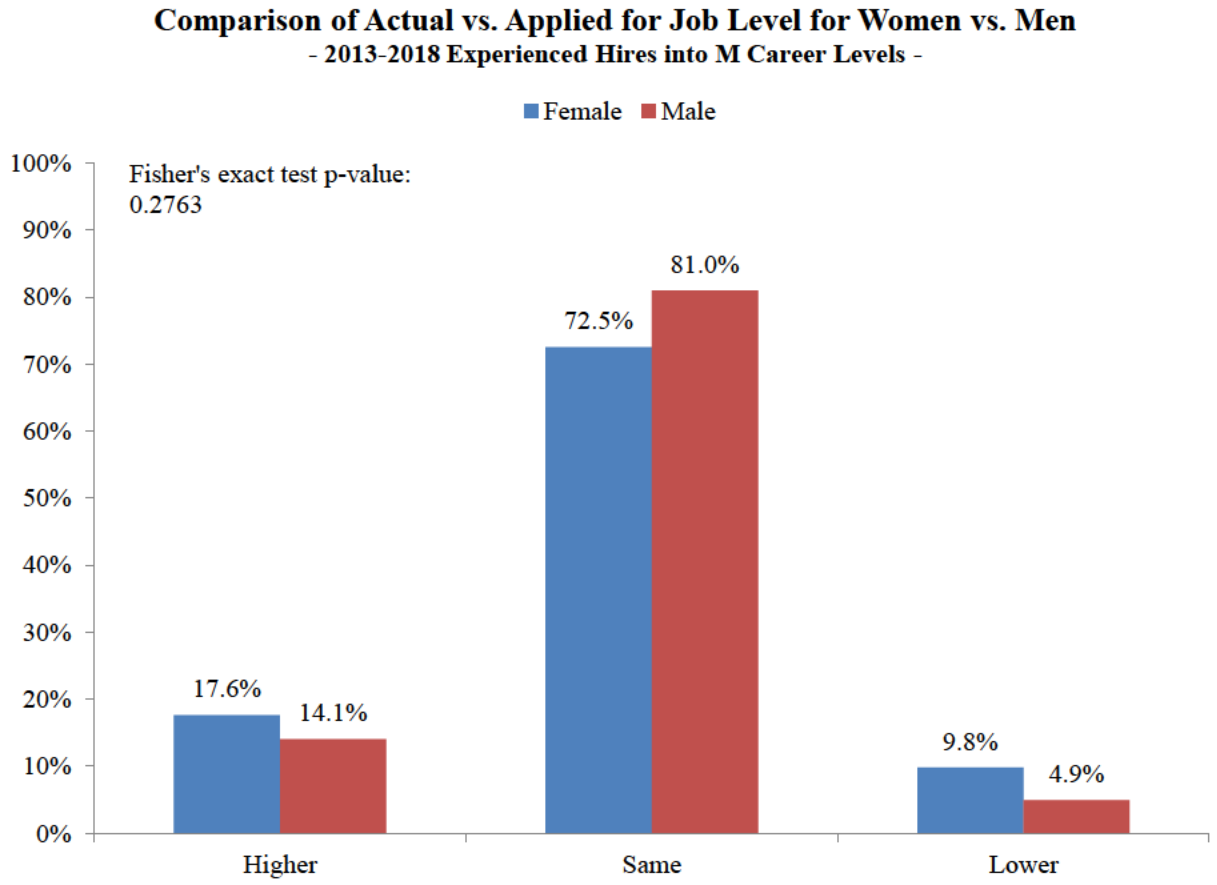
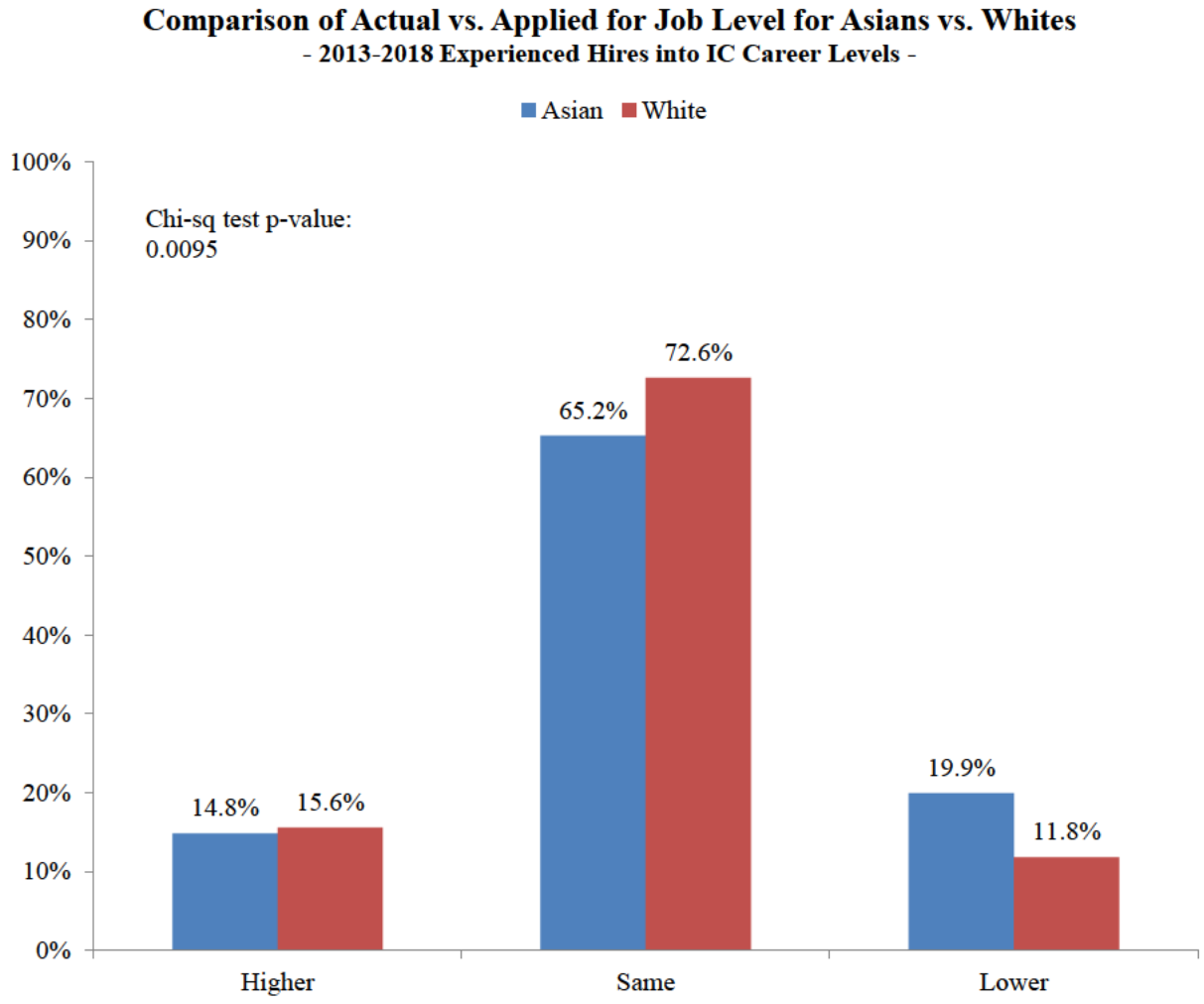


154. The results for Asians and Whites without controls in the chart below show that Asians are slightly less likely than Whites to be moved up an IC level relative to the level they applied for and more likely than Whites to be moved down an IC level, and the difference before taking any controls into account is statistically significant. In the ordered logit model that controls for year and experience, Asians are more likely to be moved up an IC level than are Whites, but the differences are not statistically significant. This corresponds to what the OFCCP back-up showed.



155. In the management track, Asians are more likely to be moved up a level relative to Whites, and less likely to be moved down, but the differences are not statistically significant. In the ordered logit model that controls for year and experience, Asians are more likely to be moved up an M level than are Whites, but again, the differences are not statistically significant.

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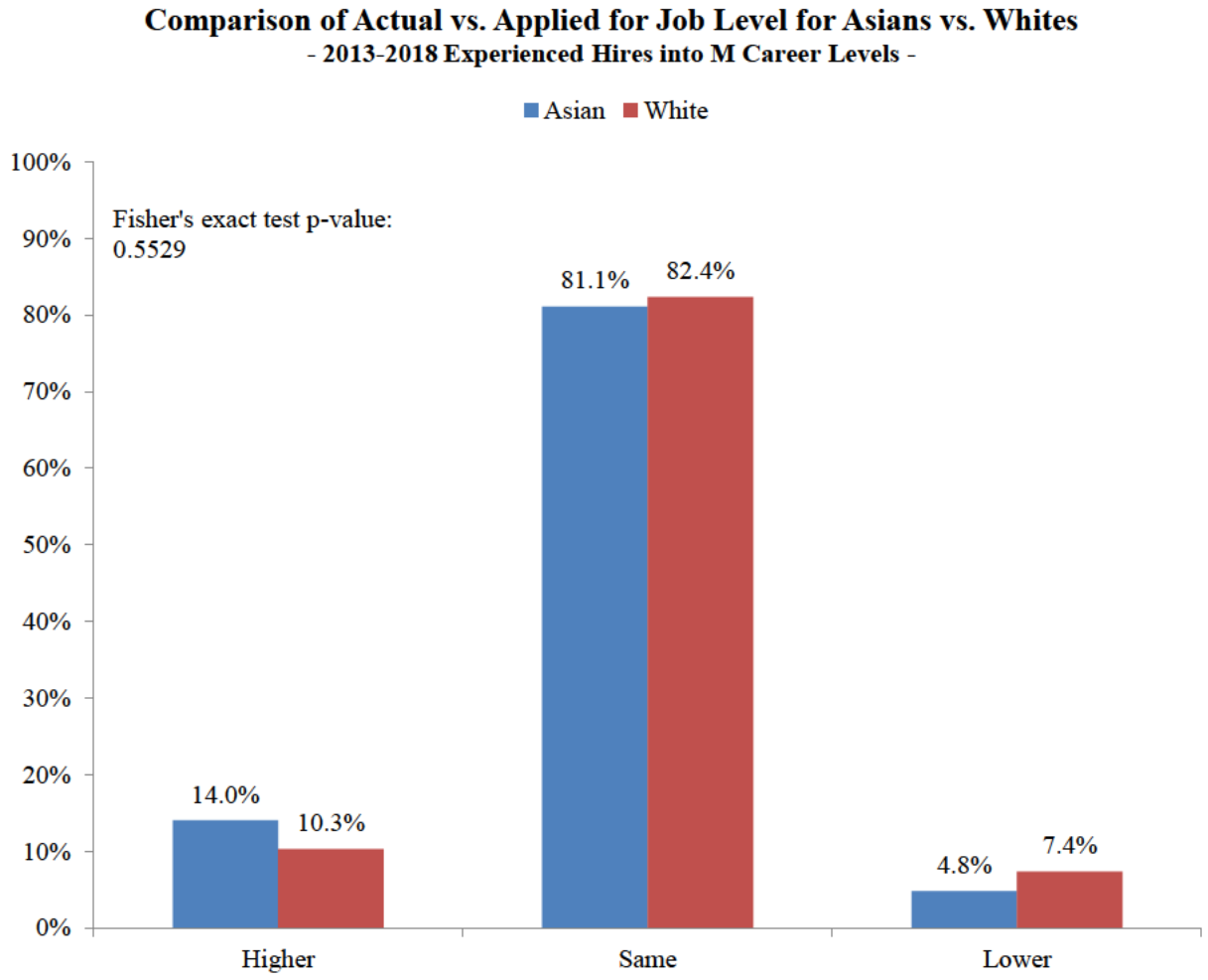

156. My analysis also finds that African American applicants are slightly less likely than Whites to be moved up an IC level relative to the level they applied for and more likely than Whites to be moved down an IC level, but the distributions are not statistically significantly different. The ordered logit model controls for year and experience and shows no statistically significant difference between African Americans and Whites in the likelihood of being moved up or down a level compared to the level applied to. There are no African-American applicants to the M levels for analysis.

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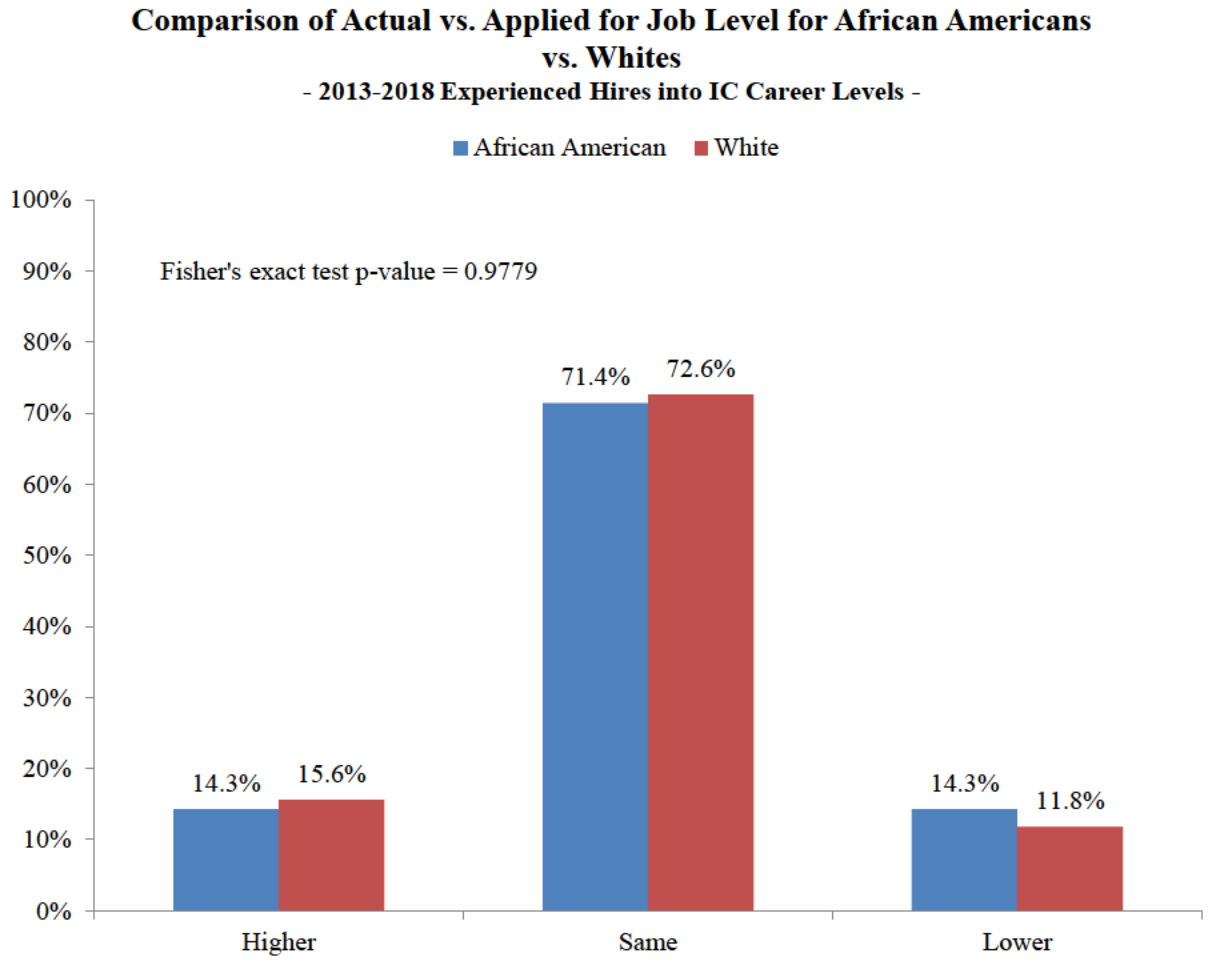

<u>When starting pay is analyzed using refined control variables and accounting for hire source, there is no pattern indicating systemic adverse outcomes for women or Asians</u>

157. As described above, there are distinct hiring paths for new employees at Oracle. Some arrive via acquisition, and typically their pay remains the same until the next focal review cycle. During the period from 2013-2018, there are only 7 employees who were acquired into one of the three job functions at headquarters (i.e., too few to analyze). College hires are recruited most often through campus programs in a completely separate hiring stream. They also tend not to have much work experience, and tend to be paid about the same, with some premium for certain top schools or for a master's degree or Ph.D. Prior pay is not a relevant issue for this group. Experienced hires, on the other hand, have a diverse set of skills

and experiences and apply to specific job postings that often include highly detailed information about the position's scope and requirements.

158. I apply a modified version of the OFCCP's starting pay model to the experienced and college hiring streams separately, to account for differences in how different characteristics are rewarded. The model includes a rough proxy measure of general previous experience (age minus 22), whether it is full-time or part-time position, the year of hire, and standard job title and organization code in order to compare employees more similarly situated in terms of the work they do and the skills they draw upon than does OFCCPs career-level-based model.

159. Among experienced hires, the largest group of new hires, there are no statistically significant pay difference for women in any of the three job functions. Average starting pay for Asian experienced hires and White experienced hires are not statistically significantly different. The difference in starting pay for African-Americans compared to Whites in PRODEV is also not statistically significant. Taken together, I do not see evidence of a pattern of adverse results for any of the protected groups.

Regression Analysis of Starting Base Pay for Experienced Hires
Models with Gender or Race Show No Statistically Significant Differences
- 2013-2018 -

Job Function	Group	# Protected Group-Hires	Pay Difference (%)	T-Value
INFTECH	Female vs. Male	57	-2.29%	-1.06
PRODEV	Female vs. Male	383	-1.19%	-1.80
	Asian vs. White	1,292	-0.17%	-0.23
	African American vs. White	8	-9.79%	-1.59
SUPP	Female vs. Male	7	-3.13%	-0.32

Note: 12 employees in PRODEV and 1 employee in INFTECH were hired twice during the period.
Model controls for gender/race, experience (age minus 22), part-time/full-time, year of hire, standard job title, and organization.

160. There are too few college hires in INFTECH and SUPPORT to analyze separately, but it is possible in PRODEV. Entry level hires from colleges are not hired into specific positions. The regression

model thus controls for experience and career level to take differences in degrees earned into account (about 5% are over age 30), and their hire year, but does not control for job title or organization. There are no statistically significant results for any of the protected groups, and in fact, the results are positive for women.

Regression Analysis of Starting Base Pay for College Hires
Model with Gender/Race Effects Shows No Statistically Significant Differences
- 2013-2018 -

Job Function	Group	# Protected Group	Pay Difference (%)	T-Value
PRODEV	Female vs. Male	212	0.77%	1.82
	Asian vs. White	592	-1.54%	-1.82
	African American vs. White	13	0.25%	0.11

Model controls for race/gender, experience (age minus 22), career level, and year of hire. They are all fulltime employees, and so no additional control was necessary.

THE OFCCP ANALYSIS OF WAGE GROWTH IS FLAWED

Women do not experience slower wage growth, contrary to the claims by the OFCCP

161. The OFCCP analyzed growth in base pay in Product Development from 2003-2016, controlling for gender or race, Career Level, whether standard job title changed from previous year, previous experience (age minus 18 minus Oracle America, Inc. tenure), time at Oracle America, Inc., whether the person worked full-time in the previous and in the current year, whether they were exempt in the previous and current year, and calendar year. They concluded that Asians and women "experienced slower wage growth […] to a statistically significant degree," though they do not show or otherwise describe the coefficients in the SAC. They also did not analyze women in the other two job functions to test whether their argument was consistent across the job functions.

162. My wage growth model adds controls for whether someone took a leave of absence during the year, whether they received a patent bonus during the year and their organization. The organization variable is important because bonuses and pay raises are set according to budgets controlled in different ways by different managers, and because employees are encouraged to explore career paths in various organizations.[126] The results show there is no pattern of statistically significant difference in wage growth by gender in any of the three job functions. For example, in INFTECH, in 2013, average pay growth was [redacted] for men and [redacted] for women (0.74 percentage points higher). The difference is small and not statistically significant. The coefficient is small and positive again in 2015 and 2016, indicating women's wage growth is slightly higher than men's, and in other years it is small and negative, but none show a statistically significant difference in wage growth. In PRODEV, the coefficient on women's wage growth is only slightly below that of men (and slightly above in 2018) and it is not statistically significant, other than in 2016. In SUPPORT, women's wage growth is slightly higher than men's in every year except 2013 and 2017, but it is never a statistically significant difference.

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[126] This is described in HR documents that also discuss how different Lines of Business ("LOB") exert different amounts of control over the process. "If we have a budget, it is determined by country and function, and allocated at the very top executive level. Each LOB head uses the budget in the way that he or she believes is appropriate for the LOB. The budgets are pushed from the top down, and some LOBs may stop at a specific level of management when allocating. For example, some organizations don't push the budgets any further than the M4 level. Even if a budget is not pushed all the way down to a mgr in CWB, managers may still allocate money to their employees." (ORACLE_HQCA_0000056239_HR REFRESH_CWB_TRAINING_APR2011v3_Updated_June2013V3 (Native).PPTX , p. 5.)

"Salary increases are based on your productivity and contributions, company performance. Employees are encouraged to move around the company." Oracle U.S. Employee Handbook, p. 42. (ORACLE_HQCA_0000000464).

"Provided you have been in a position for a reasonable amount of time, we encourage you to explore opportunities for change and advancement. […] Both you and Oracle benefit when you are allowed to learn and expand your capabilities by working in different jobs in the company. […] To respond to a job posting, contact the person listed in the posting to arrange an interview with the hiring manager. You may also contact a manager of an organization where you would like to work, even if there is no listed, open position." Oracle U.S. Employee Handbook, p. 45 (ORACLE_HQCA_0000000464).

Analysis of Pay Growth for Women vs. Men Shows No Statistically Significant Difference for Women With the Exception of a Single Year Within PRODEV

Refined Model for Female vs. Male Annual Wage Growth						
Job Function	**Year**	**# Obs Used**	**# Protected Group**	**Average Pay Growth**	**Coefficient**	**T-Value**
INFTECH	2013	440	124	[redacted]	0.0074	1.20
	2014	447	124	[redacted]	-0.0033	-0.77
	2015	556	136	[redacted]	0.0023	0.55
	2016	604	143	[redacted]	0.0031	0.72
	2017	543	132	[redacted]	-0.0001	-0.03
	2018	521	127	[redacted]	0.0033	0.64
PRODEV	2013	3,892	1,120	[redacted]	-0.0017	-0.83
	2014	3,861	1,108	[redacted]	-0.0012	-0.70
	2015	3,804	1,076	[redacted]	-0.0026	-1.47
	2016	3,803	1,055	[redacted]	-0.0033	-2.39
	2017	3,813	1,050	[redacted]	-0.0013	-1.10
	2018	3,571	994	[redacted]	0.0013	0.60
SUPP	2013	233	42	[redacted]	-0.0053	-0.54
	2014	220	42	[redacted]	0.0036	0.32
	2015	103	31	[redacted]	0.0146	1.60
	2016	95	23	[redacted]	0.0126	1.31
	2017	85	20	[redacted]	-0.0070	-0.70
	2018	83	21	[redacted]	0.0160	1.55

Model controls for female, standard job title, part-time/full-time, part-time/full-time in previous year, exempt status in previous year, organization, total Oracle tenure (including time at acquisition and non-USA affiliate), age minus total Oracle tenure minus 22, whether employee had a patent bonus in current year, whether leave of absence was in current year, whether there was a career level change, whether there was a job title change.

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Asians and African Americans do not experience slower wage growth, contrary to the claims by the OFCCP

163. My modified analyses show very similar results for Asians and African Americans: a mix of positive and negative coefficients, but no statistically significant differences between Asians and Whites or between African Americans and Whites.

Analysis of Pay Growth for Asians vs. Whites Shows No Statistically Significant Difference for Asians in Any Year

Refined Model for Asians vs. Whites Annual Wage Growth						
Job Function	**Year**	**# Obs Used**	**# Protected Group**	**Average Pay Growth**	**Coefficient**	**T-Value**
PRODEV	2013	3,774	2,743	[redacted]	0.0010	0.44
PRODEV	2014	3,745	2,761	[redacted]	-0.0003	-0.17
PRODEV	2015	3,677	2,743	[redacted]	0.0000	-0.01
PRODEV	2016	3,653	2,777	[redacted]	-0.0014	-0.89
PRODEV	2017	3,666	2,817	[redacted]	-0.0006	-0.42
PRODEV	2018	3,421	2,652	[redacted]	0.0025	0.98

Model controls for Asian, standard job title, part-time/full-time, part-time/full-time in previous year, exempt status in previous year, organization, total Oracle tenure (including time at acquisition and non-USA affiliate), age minus total Oracle tenure minus 22, whether employee had a patent bonus in current year, whether leave of absence was in current year, whether there was a career level change, whether there was a job title change.

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Analysis of Pay Growth for African Americans vs. Whites Shows No Statistically Significant Difference for African Americans in Any Year

Refined Model for African Americans vs. Whites Annual Wage Growth						
Job Function	**Year**	**# Obs Used**	**# Protected Group**	**Average Pay Growth**	**Coefficient**	**T-Value**
PRODEV	2013	1,056	25	[redacted]	-0.0104	-0.71
PRODEV	2014	1,010	26	[redacted]	0.0008	0.08
PRODEV	2015	959	25	[redacted]	0.0014	0.11
PRODEV	2016	905	29	[redacted]	0.0007	0.08
PRODEV	2017	876	27	[redacted]	-0.0010	-0.21
PRODEV	2018	796	27	[redacted]	-0.0019	-0.17

Model controls for African American, standard job title, part-time/full-time, part-time/full-time in previous year, exempt status in previous year, organization, total Oracle tenure (including time at acquisition and non-USA affiliate), age minus total Oracle tenure minus 22, whether employee had a patent bonus in current year, whether leave of absence was in current year, whether there was a career level change, whether there was a job title change.

THE OFCCP SELECTIVELY REPORTED RESULTS IN THE SAC

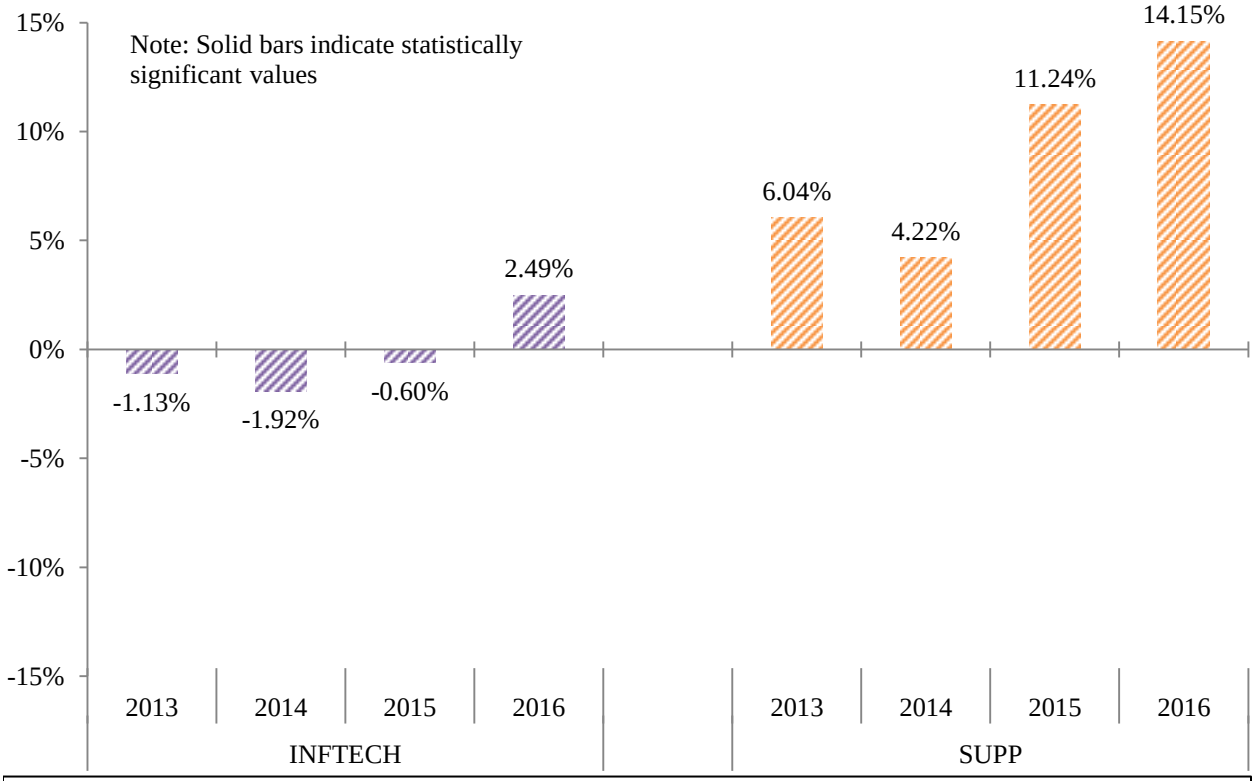
The OFCCP points to company-wide policies and practices to explain claimed pay disparities but to the results for Asians in SUPPORT and INFTECH are inconsistent with that theory

164. The OFCCP limits its claims in the SAC to Asians in the PRODEV job function. But the OFCCP also claims the "systematic underpayment of women and Asian employees is due, in part, to suppression of those employees' starting pay."[127] They do not, however, explain why this theory dictates adverse pay outcomes for women in all three job functions but for Asians only in PRODEV, especially given that Asian women work in all three functions. Had the OFCCP presented the results of applying their model to Asians and Whites in the other two job functions, they would have had to discuss results that are not only statistically insignificant, but which for one year in INFTECH and all four years in SUPPORT are

[127] SAC, paragraph 22.

positive for Asian employees.[128] This raises questions about the consistency of their arguments and the degree to which they have cherry-picked results to fit their argument.

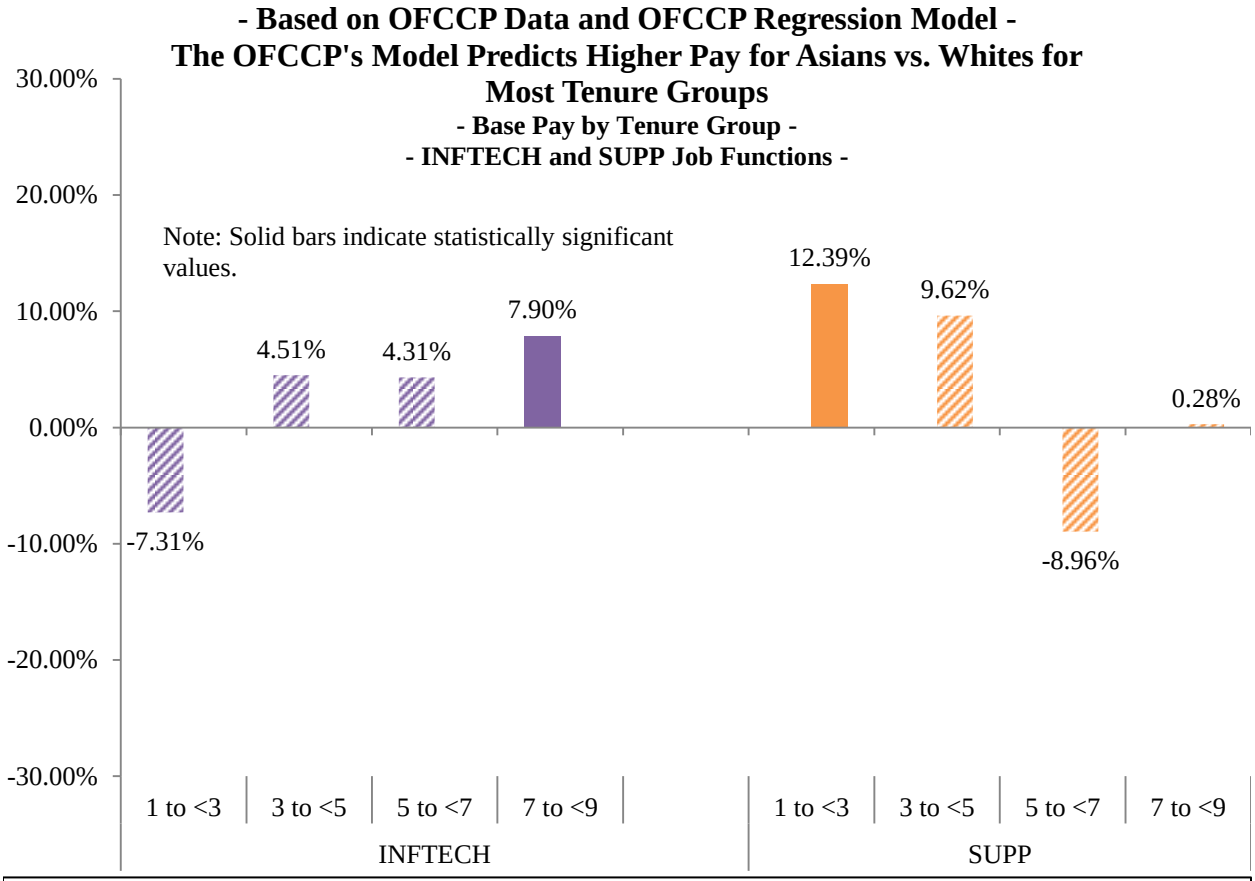
- Based on OFCCP Data and OFCCP Regression Model -
The OFCCP's Regression Analysis of Total Compensation Shows No Statistically Significant Results for Asians vs. Whites
- INFTECH and SUPP Job Functions -



The OFCCP model controls for Asian, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

165. Similarly, the OFCCP argues that the pay gap opens up with time, such that longer tenured Asian employees do worse. Yet this is not true when their exact same model is applied to the INFTECH and SUPPORT job functions.

[128] The OFCCP ran their model in the PRODEV job function but it is a straightforward change to run the same model on the same data, but on the other two job functions.



Model controls for Asian, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

166. In fact, the OFCCP's results show that on average Asians in the highest tenure group are paid statistically significantly *more* than Whites in INFTECH. Overall, when the OFCCP model analyzing wage growth is applied to INFTECH, it shows that Asians have a slightly higher wage growth [redacted]. In SUPPORT, Asian wage growth is statistically significantly higher ([redacted] than for whites.[129]

167. The same narrow focus combined with expansive theories about causality is at work in reporting results for starting pay. The OFCCP reports that Asians in PRODEV are paid less upon hire, yet using their own model there is no statistically significant difference in starting pay between Asians and Whites in INFTECH (Asians earn 1.94% more on average at the start using the OFCCP model) or in SUPPORT

[129] This is for years 2003-2016. For years 2013-2016, in the OFCCP's model, Asians have slightly lower but not statistically significantly different wage growth [redacted]) in INFTECH and a statistically significantly higher wage growth ([redacted]) in SUPPORT.

(Asians earn 0.07% less on average at the start using the OFCCP model). The OFCCP does not explain why their company-wide theories about pay disparities in PRODEV do not generate the same results in their model in other job functions for Asians, but do for women.

168. Neither the data in this case nor the OFCCP's analyses of that data support the existence of company-wide discriminatory patterns and practices leading to lower starting pay and increasingly lower relative pay through time. Even the OFCCP's own model showed statistically significant adverse results for women only in PRODEV, INFTECH and SUPPORT and for Asians only in PRODEV, but somehow not for Asians in INFTECH and SUPPORT. If nothing else, Asian women also work in INFTECH and SUPPORT, which means these OFCCP explanations are supposed to apply only when they are considered as women but not when they are considered as Asian. This analytically incoherent explanation relies on the OFCCP suppressing their own results based on their own regression model on their own data in other job functions.[130]

The OFCCP selectively reported statistical results for Asians in PRODEV

169. The SAC states that Asians are only 49% as likely as Whites in PRODEV to be "assigned" into higher global career levels as managers.[131] Their back-up also contains unreported results for non-managers in the IC career levels. In the IC career levels, Asians are 17.8% *more likely* to be placed in the higher levels than are Whites according to the OFCCP's own model, though the difference is not statistically significant. I address their model's shortcomings elsewhere in this report, but I discuss them here in relation to my concern that the OFCCP is selectively picking results to support its claim.

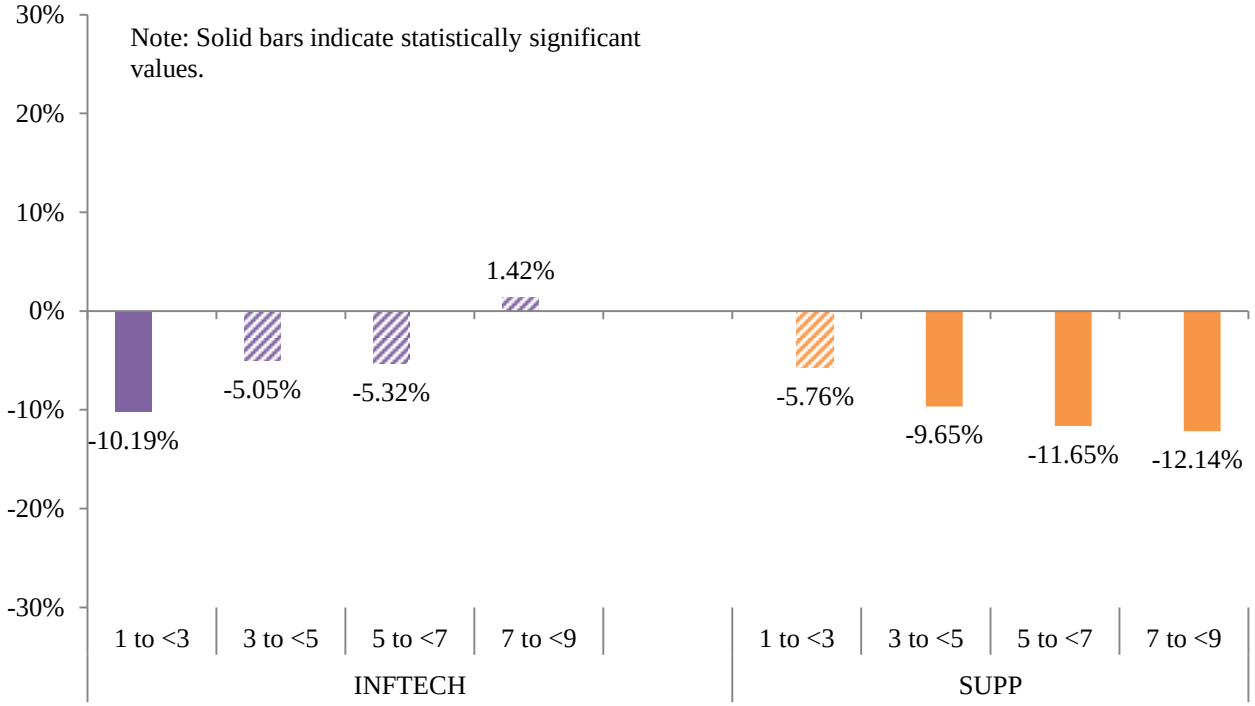
[130] Moreover, the SAC only reports their results by tenure group for base pay and not total compensation. Had they reported total compensation results for Asians in PRODEV, they would have had to acknowledge that there is no statistically significant difference in total compensation between Asian and Whites in PRODEV in the 1-3 and 3-5 year tenure groups according to their own model.
[131] SAC, paragraph 21.

The OFCCP selectively reported results for women

170. The OFCCP claims in the SAC that "the pay gap increases for female employees as they remain at Oracle for longer periods of time."[132] However, they only show the results for women in PRODEV. When I run their SAC statistical model for women in INFTECH, I find that the pay gap (according to their model) is adverse to women and statistically significant in the 1-3 year tenure group, but that it falls in size with tenure and is positive for the highest tenure band. In SUPPORT, the trend is similar to PRODEV but the pay gap in the youngest tenure band is not statistically significant from zero, which implies according to the OFCCP interpretation of these analyses that Oracle does not suppress pay early on but suddenly decides to do so later. There are methodological issues with this analysis that I address elsewhere, but these results are based on OFCCP methods and OFCCP data which they chose not to present. The results in INFTECH contradict their claim about the pay gap growing with tenure for all women, making the claims in the SAC misleading in light of the results their own model produced.

[132] SAC, paragraph 26.

- Based on OFCCP Data and OFCCP Regression Model -
The Pay Gap Does Not Increase With Tenure in INFTECH and is Not Statistically Significant for the Youngest Tenure Group in SUPP for Females vs. Males
- Base Pay by Tenure Group -
- INFTECH and SUPP Job Functions -



Model controls for female, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

<u>The OFCCP selectively reported results for African-Americans</u>

171. The OFCCP presents a table following paragraph 16 of the SAC that purports to support their claim that African-American employees in PRODEV are undercompensated relative to white employees. Had they not switched to analyzing base pay but instead reported the results for total compensation – consistent with their approach to analyzing pay of women and Asians – they would have reported that there are no statistically significant difference in pay between African-Americans and Whites, according to their own model.

172. Not only did they switch from total compensation to base pay in order to select these results, they present only the results for 2015 and 2016, which I understand to be outside the audit window. This

omission does not have to do with changing sample sizes – there are as many African American employees in 2013 and 2014 as in 2015 and 2016. They chose to present only the years in which they found statistically significant pay disparities and not the years in which the results did not demonstrate statistically significant pay disparities according to their model, and thus that there is not a longstanding pattern by year even in their own analysis.

173. As concerns their tenure group analyses, the OFCCP does not discuss why base pay by tenure group for African Americans is small and not statistically significant in the 3 to 5 year tenure group, the largest of the four tenure groups they report on in the SAC. And had they reported results for total compensation by tenure group, they would show a pay gap only in the highest tenure group, and again, a pattern across tenure groups that does not support their argument that the pay gap increases over time.

174. With regard to starting pay, in paragraph 18 of the SAC, the OFCCP notes that women and Asians earn less at hire according to their models (without noting they limited the analysis to employees in PRODEV), but they omit any discussion of the fact that there is no statistically significant starting pay gap for African Americans in any of the three job functions.

175. Finally, in paragraphs 30 and 31 of the SAC, wage growth for women and Asians is discussed, but not the fact that according to their model, wage growth for African Americans is not statistically significantly different from whites in PRODEV (or INFTECH or SUPPORT as well).

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THERE IS NO EMPIRICAL SUPPORT FOR THE OFCCP CLAIM THAT DAMAGES ARE OWED

176. The OFCCP uses its regression model to compute damages. Their approach is to use the regression model coefficient on gender or race to formulaically arrive at an aggregate damages figure by multiplying the coefficient by average earnings for white men.[133] Even if such an approach were warranted, there are serious problems with the OFCCP's implementation, as I discuss next.

When the proper measure of total compensation is used, and a refined set of control variables to similarly situate employees, there is no pattern of adverse outcomes for women and therefore no damages to calculate

177. The OFCCP regression model is, as I discussed above, unreliable for a number of reasons. It incorrectly measured total compensation, mis-measured prior experience, mis-measured tenure at Oracle, failed to take leaves of absence into account, and ignored information about employee innovation as well as information about the kinds of products and services employees work on. The scatterplots showed that their regression model could not explain the widely varied outcomes for women, in which large numbers of female employees earned much more than their model predicted. The refined model I present in this report fixes those problems and shows that, once those errors are corrected, and even if one continues to aggregate the analyses into the broad job function groupings OFCCP uses, there is no pattern of adverse compensation results for women. Thus, there are no damages to estimate.

The OFCCP did not present its results for total compensation for African Americans which showed no statistically significant difference

178. The OFCCP claims that based on its (flawed) analysis, African American employees are owed "at least $1,300,000"[134] However, the analysis they presented in the SAC examined base salary instead of total compensation, unlike its other analyses. When their analysis of pay for African-Americans is re-

[133] The SAC also makes reference to the proffered damages estimates being "much higher" than even the number they present because, they claim, the "practices" at Oracle have not been corrected" since the first complaint was filed in January 2017 (SAC, paragraph 17). However, the May 24, 2019 OFCCP letter from Abigail Daquiz to Warrington Parker notes that the damages estimates also included nominal damages for 2017 and 2018 plus interest.

[134] SAC, paragraph 16.

estimated using their measure of total compensation, the OFCCP's own model shows that there is no statistically significant gap in total compensation between African Americans and Whites. Their own model shows that no damages are owed.

The OFCCP calculated damages for Asian men but its own model shows there is no consistent adverse outcomes for Asian men

179. The OFCCP claims that Asian employees are owed "at least $234,000,000".[135] They explained how they arrived at that number in a letter dated May 24, 2019, where they note that the estimated damages for Asians in the SAC are for men only, because Asian women were included in their overall damages estimate for women "in order to avoid double counting."[136] However, the regression model they use to justify $234 million in back pay estimated the Asian male damages compared all Asian employees to all White employees.

180. Had the OFCCP estimated their regression model only for Asian male and white male employees to generate a damages estimate for Asian men, they would have observed that only two of the four years show a statistically significant pay gap (using their data and their model and making no other corrections). In 2013 and 2016, the estimated pay difference is not statistically significantly different from zero. Yet their damages estimate includes all of these years in its calculation. There is no consistent statistically significant adverse pattern year to year, and these results do not support calculating damages for every year from 2013 on.

[135] SAC, paragraph 15.
[136] OFCCP Letter from Abigail Daquiz to Warrington Parker, dated May 24, 2019, page 2. Note that they also assigned damages to part time employees as if they worked full time.

- OFCCP Data and Model Restricted to Asian and White Men -

There is No Systematic Pattern of Statistically Significant Results for Asian Men vs. White Men

- PRODEV -

Year	# Protected Group	Pay Gap (%)	T-Value
2013	1,879	-2.60%	-1.68
2014	1,895	-7.48%	-4.58
2015	1,885	-7.26%	-4.91
2016	1,928	-2.94%	-1.84

The OFCCP model controls for Asian male, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Due to their overly simplistic formulaic approach, the OFCCP awarded damages to part-year employees as if they worked all year

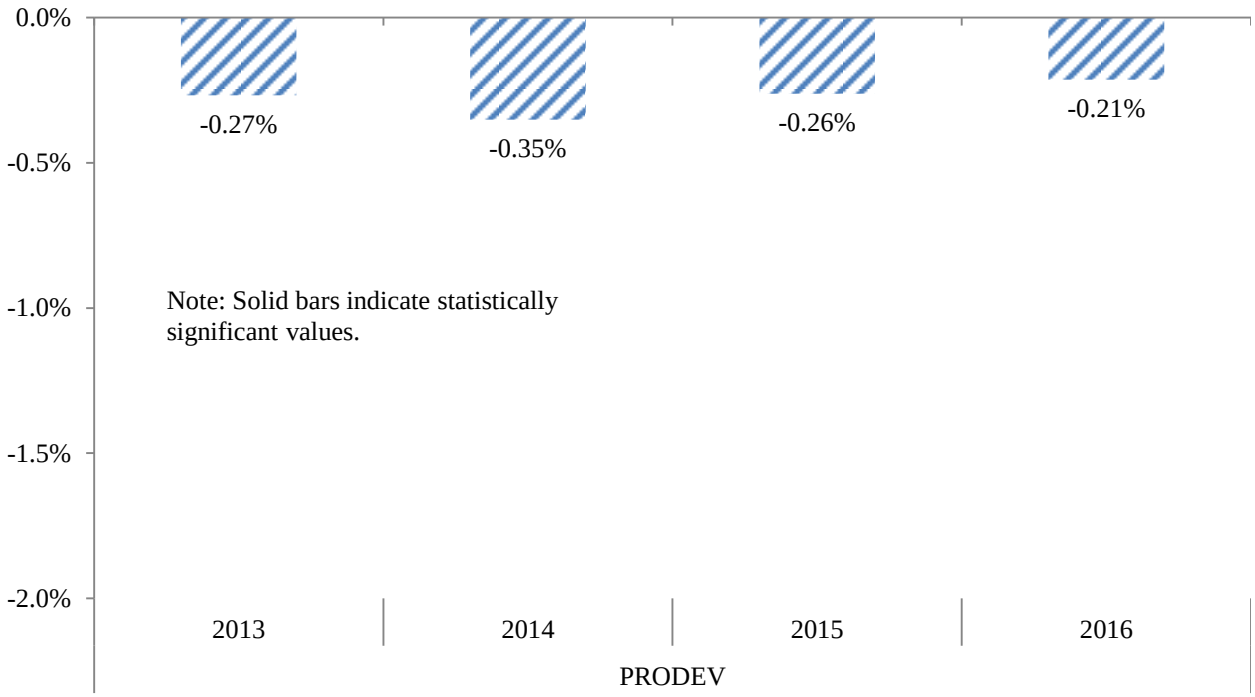
181. In addition, when the OFCCP estimated damages, it calculated damages for employees who worked part-time or part-year (including women) as if they worked full-time, full-year. To estimate damages for women, for example, the OFCCP multiplied their regression-estimated 2013 pay difference for women (-6.78% in PRODEV) by the average 2013 total compensation for white males working all year. This dollar amount was then multiplied by the total number of women each year, including those just hired or terminated part way through the year. In effect, because of a simplistic formulaic approach that does not take account of employee by employee differences, the OFCCP attributed damages to part-time or part-year employees as if they worked full-time, all year; this approach is clearly incorrect.

When the proper measure of total compensation is used, and a refined set of control variables to similarly situate employees is used, there is no pay difference between Asian men and white men and therefore there are no damages to calculate

182. As described above, the OFCCP controls for race/ethnicity, company tenure based on US Oracle hire date, previous experience measured as age minus company tenure minus 18, whether the employee is exempt or non-exempt, full-time or part-time, and their standard job title. This model is flawed for a number of reasons as described above.

183. The graph below shows the year by year results from my refined regression model, estimated for Asian men compared to White men. Total compensation was analyzed, controlling for race, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), age minus total Oracle tenure minus 22, cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition. The pay difference is miniscule and the t-statistics are close to zero.

Modified Regression Analysis of Total Compensation Shows No Statistically Significant Results for Asian Males vs. White Males in Any Year Within PRODEV



Model controls for Asian male, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in standard job title, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

184. When this refined model is applied, which uses the correct measure for total compensation and a more appropriate set of control variables to similarly situate employees based on skill and responsibilities,

there is no pay difference between Asian men and white men. Thus, instead of $234 million, Asian men experienced no shortfall on pay. There are no damages to award to Asian men, contrary to what the OFCCP claims, because there is no pay gap between the two groups.

CONCLUSION

185. In this final section of my report, I summarize some of the key conclusions I have reached after considering the OFCCP's SAC analyses against the data, documents, and other information available about work at Oracle. The OFCCP's analyses of compensation are flawed in a number of ways, and do not support the inference that all women in the three job functions and Asians and African Americans in the PRODEV function are paid less than men (Whites) doing similar work that demands similar levels of skills and responsibility. Even though the OFCCP was concerned only about 3 of 16 job functions at Oracle, the OFCCP aggregated all of its models to the job function level, across many managers, organizations, and types and levels of work. Yet my analysis showed there are wide variations in pay outcomes across employees even according to the OFCCP's aggregated common statistical model. This wide variation in outcomes is inconsistent with the notion that companywide explanations and a common model can be used to explain and meaningfully analyze the pay for women and Asians across Oracle.

186. The OFCCP's SAC regression model does not compare employees who are performing substantially similar work from a labor economics perspective. Standard job titles are broadly defined and the requisitions showed that employees with the same title can be doing quite different work. Those hired into the company into positions with identical standard job titles codes earn widely varying amounts. This variation has little to do with years of labor market experience or age; instead, it appears that if a successful candidate has the requisite specific skills, they can be hired and paid commensurate with the skills and responsibilities that the position requires. For Software Developer 4 jobs, the largest single job code in the data, the range of ages hired at the same pay level spans from 25 to 62, and at any given age, the range of pay is almost a [redacted]. Standard job title alone is insufficient to similarly situate employees. It is very unlikely from a labor economics perspective that two individuals sharing the

identical standard job title, with one paid [redacted] what the other earns, are doing substantially similar work. Oracle standard job titles (or job codes) do not operate to "narrowly define" the nature of work from the perspective of a labor economist. That Oracle organizes its workforce with a particular hierarchical and task-type structure does not mean that this structure alone is sufficient for a labor economist asked to analyze this data in the context of a pattern and practice pay discrimination claim. These are crude measures from an analytical perspective, yet they are all that OFCCP's models use. As a result, the OFCCP regression model is not correctly specified, and does not compare employees performing substantially similar work.

187. The OFCCP tenure measures are deeply flawed. First, "previous experience" is simply the employee's age minus 18 minus years since hire at Oracle America, Inc. OFCCP's model does nothing to capture differences in relevant prior experience, which can matter significantly for pay decisions. Second, the OFCCP fails to measure and take account of number of years employees may have worked at an Oracle affiliate overseas or in an acquired firm. Many employees in the data previously worked at an Oracle affiliate outside of the USA, which plausibly constitutes relevant experience in many cases, as would experience at a firm later purchased by Oracle. OFCCP's model does not credit these employees with these types of experience. OFCCP also did not control for tenure in the current standard job title. Instead, the OFCCP model considers someone new to a position to be as skilled as someone who has worked in the position for years, as long as both were hired at Oracle America, Inc. in the same year. Finally, the OFCCP does not account for leaves of absence or other periods of unemployment, and thus does not actually compare employees who have spent equivalent amounts of time at work, improving their job-related skills and abilities.

188. The OFCCP also analyzed starting pay. But their starting pay regression models did not even control for standard job title but rather for career level, a broad measure of career advancement in which a Technical Writer and a Hardware Developer can share a level while having few skills in common. It is clear from the requisitions that experienced hires have diverse histories of skills and specialties and they do not apply at random to Oracle. Someone working in software security, for example, is unlikely to

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apply for a job developing application software for use by accounting firms. The OFCCP model, however, only controls for Career Level and not for standard job title and organization to address these differences.

189. My refinements to the OFCCP's model includes a measure of general previous experience (age minus company tenure minus 22), whether the position applied to is exempt or non-exempt, whether it is full-time or part-time, the year of hire, and standard job title and organization code in order to compare employees more similarly situated in terms of the work they do and the skills they draw upon. For each demographic group, there is a mix of positive and negative coefficients, indicating no pattern across the job functions. I further find no differences in terms of pay growth thereafter, once additional readily available additional factors are introduced.

190. Finally, there are a number of other data errors and other technical issues in the OFCCP analysis. Most importantly, the OFCCP measure of total compensation is taxable pay in the year, which includes exercised stock options from years past, 401K decisions and any other adjustments that are not a reflection of actual work that year. The OFCCP total compensation results are uninterpretable, because stock awards make up sizeable percentages of compensation, especially in the [redacted] and in [redacted] in particular.

191. The OFCCP also only selectively reported its results in their SAC. In their model analyzing total compensation, there are no statistically significant differences in pay between African-Americans and Whites, but rather than report that, they switch to an analysis of base pay (unlike any of their other analyses). The SAC also reports results claiming to show that Asians are less likely as Whites in PRODEV to occupy higher global career levels on the managerial career path. Yet their back-up shows that Asians are more likely to be in higher positions in the IC path. Their analysis does not take into account the positions applied for, and when I correct for this, I show that new hires are for the most part placed where they apply – but my point here is that the OFCCP selectively reported its results to support its claims in the SAC. Similarly, the OFCCP claims that pay differences for women increase over time;

yet their own results for INFTECH contradict their claim about the pay gap growing with tenure for all women.

192. For the reasons enumerated herein, it is my opinion that the analyses presented by the OFCCP to support their claims in the SAC are mis-specified, suffer from omitted variable bias, and have a number of important methodological flaws. As a result, my opinion is that the OFCCP analyses do not support the inferences of pay discrimination that they seek to make.

Executed this 19th day of July, 2019 in Los Angeles, California.

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Ali Saad, Ph.D.

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Attachment A: Saad CV and Testimony

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ALI SAAD, Ph.D., MANAGING PARTNER

Dr. Saad is the Managing Partner of Resolution Economics LLC. He has a Ph.D. in Economics from the University of Chicago. Prior to Resolution Economics, Dr. Saad was a partner at Deloitte & Touche LLP and at Altschuler, Melvoin and Glasser LLP. Before that he was in the disputes consulting group at Price Waterhouse, first in New York, and then in Los Angeles. Prior to his consulting career, Dr. Saad served as an Assistant Professor of Economics at Baruch College of the City University of New York (CUNY).

Professional Experience

Dr. Saad's experience is extensive in the area of statistical and economic analysis of liability and damages related to employment litigation matters. His experience is extensive in the application of economics and statistical methods to class action employment discrimination matters. He is also experienced in designing, implementing, and analyzing surveys and observation studies as well as conducting empirical analyses related to exempt/non-exempt status, hours worked, uncompensated time, meal and rest breaks, rounding, and other wage and hour issues. He has also performed statistical and damages analyses for a broad range of commercial litigation matters including breach of contract, insurance coverage, environmental claims, patent infringement, antitrust and real estate financing. Dr. Saad has testified a number of times at deposition and trial. Dr. Saad also regularly consults to clients regarding business issues related to employment practices.

Employment Matters

Dr. Saad provides a variety of services related to employment litigation. His experience is extensive in conducting statistical and economic analysis related to issues of liability for employment discrimination matters. He also has designed and conducted many surveys and observational studies related to wage and hour issues. Dr. Saad has also performed analyses of economic damages in both class action and single plaintiff matters.

Statistical and Economic Analysis in Discrimination Matters

Assignments representative of Dr. Saad's experience in performing analyses in connection with employment discrimination matters include the following:

- Consulting and expert witness services in national class action race discrimination matter involving issues of pay, promotion, work assignment, and a variety of other challenged employment practices. Services included creating databases from diverse and voluminous source materials, and conducting extensive statistical analyses.

- Consulting and expert witness services in national class action gender discrimination matter involving issues of job assignment and promotion. Services included creating databases from diverse and voluminous source materials, and conducting extensive statistical analyses.

- Consulting and expert witness services in a class action case alleging that contracts were misleading. Services included processing and analyzing large quantities of data, and performing statistical analysis of the criteria determining class membership.

- Consulting and expert witness services in connection with a major class action alleging gender discrimination in pay and promotion at a large high-tech employer. Services included creating analytical databases, and developing economic and statistical arguments concerning the relationship between productivity-related variables, pay/promotion, and gender.

- Consulting and expert witness services in an antitrust and discrimination matter in which a group of businesses alleged violations of antitrust and discrimination laws by another group of businesses. Services included data construction, and statistical analysis related to issues of liability.

- Consulting and expert witness services on behalf of plaintiffs' counsel in a series of cases alleging race discrimination in hiring. Services included creating analytical databases, studying the relationship between race and hiring, and examining the features of the external labor market.

- Consulting and expert witness services in connection with a class action claim of discrimination based on age in connection with a series of layoffs resulting from the combination of two large retail chains. Services included creating analytical databases, studying the relationship between layoff and age, and examining the relationship between age and workforce composition over.

- Consulting and expert witness services in connection with EEOC allegations of race discrimination in recruiting, hiring, and initial placement at a large service providing company. Services included developing databases from diverse paper and electronic sources, and providing statistical arguments concerning the relationship between race and various other factors.

- Consulting and expert witness services to defendant's counsel in connection with a major class action alleging gender discrimination in multiple employment practices at a national retail chain. Services included developing a database from voluminous paper documents, and conducting analysis related to hiring, initial placement, and initial pay.

- Consulting and expert witness services to defendant's counsel in connection with an EEOC investigation of racial discrimination in hiring by a major service providing organization. Services included developing a database, and conducting statistical analysis related to hiring.

- Consulting services to defendant's counsel in connection with a U.S. Department of Labor OFCCP investigation of pay equity at a high-tech company. Services included design and oversight of a statistical analysis of pay equity, assessment of the OFCCP methodology, and participation in conciliation discussions between the company and the OFCCP.

- Consulting and expert witness services to defendant's counsel in connection with an allegation of age discrimination in terminations resulting from a series of mass layoffs. Services provided included developing statistical arguments concerning the relationship between age and termination.

- Consulting services to defendant's counsel in connection with a Department of Justice investigation regarding allegations of racial profiling by a large city police department. Analyzed departmental data related to over 130,000 traffic stops, pedestrian stops, and other types of police contacts that occurred in four selected weeks in 1997 and four selected weeks in 1999. Cross-referenced traffic stops data with other information sources including human resources data, precinct level paper records, and the officer discipline system to test various hypotheses.

- Consulting services and expert testimony to defendant's counsel in connection with a multi-plaintiff matter alleging race and gender discrimination in promotion and placement into coveted positions by a large city police department. Performed statistical analysis of promotion and placement into coveted positions. Quantified economic damages for several plaintiffs under failure to promote and wrongful termination theories.

- Consulting services in a case against a city government alleging discrimination in recruiting and hiring of police and firefighters. Services included using Census and other large-scale data sources to assess labor market characteristics by detailed geographic location, and conducting extensive analysis of the impact of employment tests on hiring.

- Consulting and expert witness services to defendant's counsel in a matter where plaintiff alleged that defendant's hiring practices discriminated against women. Services included converting diverse paper source materials into a usable database, and developing statistical evidence concerning plaintiff's allegation.

- Consulting services in several class action recruiting and hiring matters. Services included use of detailed census and other data to estimate labor market availabilities by geographic location, and analyzing employment practices in light of these availability findings.

- Consulting services to a major bank involved in an analysis of its fair lending practices. Services included using bank data on applicants for mortgages and other loans, and adding various demographic and geographic information to assess if the bank made loans on the basis of race, or controlling for other, observable factors could explain patterns in loan making.

- Consulting services on behalf of defendant's counsel in a major class action matter involving allegations of gender discrimination in promotion. Services included building analytical database from many sources, using the database to conduct extensive statistical analysis of plaintiffs' allegations, and estimating damages resulting from non-promotion for approximately 3,000 women occupying different jobs over a ten-year period.

- Consulting and expert witness services on behalf of defendant's counsel in two related cases alleging age discrimination in termination. Prior to plaintiffs' vesting for certain long term benefits. Services included using defendant's human resource data to test plaintiffs' specific allegations, developing statistical arguments concerning the relationship between age and termination, and performing analyses of plaintiff's damages in each case.

- Consulting services on behalf of plaintiff's counsel in distribution of award in an age discrimination matter with 75 plaintiffs. Services included developing a method to efficiently compute damages for all plaintiffs, and working with counsel, an arbitrator, and plaintiffs' committee to explain the process to plaintiffs' group.

Wage and Hour Matters

Assignments representative of Dr. Saad's experience in wage and hours matters include:

- Consulting and expert witness services to defense counsel in a national class-action wage and hour matter alleging that several thousand loan originators at a large financial institution were misclassified under FLSA. Conducted statistical analyses of hours worked records, compensation data, plaintiffs' declarations, and other data to determine if select groups of plaintiffs would be representative of the class.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several thousand General Managers and Assistant Managers at a large office supply retailer were misclassified as exempt employees. Services included designing and conducting a survey to examine whether class members were appropriately classified, analyzing the company's labor model and human resources data, and conducting statistical analyses related to a variety of class certification issues.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several thousand Assistant Managers at a large general merchandise retailer were misclassified as exempt employees. Services included designing and conducting both a survey and an observational study, to examine whether or not class members were appropriately classified. Services also included conducting extensive statistical analyses of the data collected by the survey and the observational study, and preparing materials for use in class certification proceedings.

- Consulting services to defense counsel in a class action matter alleging failure to pay overtime wages to independent sales and service representatives for a large national tool franchiser. Services included designing and implementing an hours survey to determine whether the additional hours worked claimed by some plaintiffs was representative of the additional hours worked by the class as a whole. Determined that the problem was isolated to certain geographic areas rather than nationwide.

- Consulting and expert witness services to defense counsel in a wage and hour matter alleging that several hundred store managers and assistant store managers at a chain of retail discount stores were misclassified. Services included creating and implementing a survey to examine whether class members were classified appropriately and conducting statistical analyses related to commonality of class-members and other class certification issues.

- Consulting services to defense counsel in a multi-plaintiff wage and hour matter alleging that the defendant employer failed to compensate security guards for uniform changing time and other claims of off-the-clock work. Services included designing and conducting an observation study to measure time associated with various activities.

- Consulting services to defense counsel in wage and hour matter alleging that store managers at a chain of convenience store/ gas station operations were misclassified as exempt workers. Services included designing and conducting a random sampling scheme and observational study to evaluate the amount of time that class members spent on exempt and non-exempt duties.

- Consulting services to defense counsel in a class-action wage and hour matter alleging uncompensated meal periods and breaks, unpaid overtime wages, and minimum wage violations at a field maintenance company.

Services included creating a database of hours worked from paper and electronic records, and then providing damages estimates based on a variety of assumptions and legal theories.

- Consulting services to defense counsel in a class action matter alleging a variety of wage and hour violations for hourly workers at a chain of warehouse stores. Services included analyzing data to test allegations of improper time adjustments, missed meal and rest periods, uncompensated split shifts, reporting time violations, overtime and regular rate issues, and off-the-clock work.

Employment Damages

Assignments representative of Dr. Saad's experience estimating economic damages include the following:

- Consulting services to plaintiff's counsel in a case involving a breach of employment contract allegation by a high-level executive in the emerging communications industry. Services included damages analysis based on valuation of stock options and estimation of future earnings.

- Consulting services to defendant's counsel in a case involving a wrongful termination allegation by a high-level executive in the telecommunication industry. Services included damages analysis based on valuation of stock options using the Black-Scholes Option Pricing Framework and a Monte Carlo Simulation Model.

- Consulting and expert witness services on behalf of defendant's counsel in a matter brought by a former executive who alleged wrongful termination and age discrimination against a major defense contractor following a reduction in force. Critiqued work product of the opposing expert, evaluated mitigation issues, calculated loss of earnings damages and valued losses related to stock options.

- Consulting and expert witness services on behalf of defendant's counsel in a medical malpractice action where the underlying damages issue was valuing an income stream from a closely held cash business. Performed accounting of plaintiff's financial records to determine the existence and the extent of fraud. Created financial models to calculate damages under a variety of scenarios.

- Consulting and expert witness services to defendant's counsel in a wrongful termination matter brought by senior executive of a high-tech company who alleged age discrimination. Performed analysis of mitigation factors, calculated loss of earnings, and valued future stock options.

Commercial Litigation

Dr. Saad has assisted clients in a variety of commercial litigation matters, including patent infringement, insurance coverage, antitrust, breach of contract, and real estate financing. Assignments representative of Dr. Saad's experience in these areas include the following:

- Consulting and expert witness services in a series of cases involving the real property title insurance industry. Services included performing extensive statistical analyses in connection with both liability and damages issues.

- Consulting and expert witness services in a case alleging breach of loan commitment to a commercial real estate concern. Services included constructing financial models, developing economic arguments relating to fixed versus variable rate loans, and assisting counsel in deposing the opposing expert.

- Consulting and expert witness services in a case involving a breach of contract allegation in the computer hardware industry. Services consisted of performing a damages calculation, and rebutting the opposing expert's analysis.

- Consulting and expert witness services in a case alleging that one entity caused another entity's property to be misused. Services included database creation, and statistical analysis related to issues of causation. Results indicated that there was a statistically significant relationship between defendant's actions and plaintiff's economic condition.

- Consulting services on behalf of defendant's counsel in a breach of contract matter in the context of natural resource raw materials shipping. Services included developing economic arguments regarding the but-for pricing of both the shipping service as well as the material being shipped.

- Consulting and expert witness services on behalf of defendant's counsel in a major insurance coverage case, in which the underlying claims resulted from tens of thousands of asbestos claims. Services included developing strategy for dealing with large amounts of paper information, creating a database for analysis, and performing a variety of statistical analyses.

- Consulting services on behalf of plaintiff's counsel in an antitrust matter in the consumer electronics product market. The antitrust practice alleged was predatory pricing. Services included preparing a damage analysis.

- Consulting services on behalf of defendant's counsel in a patent infringement matter in the computer hardware industry. Services included researching transfer pricing issues and analyzing complex company P&L data in preparation for damages calculation.

- Consulting services on behalf of defendant's counsel in a real estate financing dispute. Dispute revolved around the financing of a major New York office property. Services included analysis of interest rates and their relationship to potential damages at various points in time, as well as the construction of a financial model of the property with the but-for financing in place.

- Consulting services on behalf of plaintiff's counsel in an antitrust matter involving allegations of non-competitive practices and predatory pricing in the home cable television market. Services included an analysis of "raising rivals costs", as well as a statistical analysis of pricing of complex products over time.

Summary of Employment Experience

Resolution Economics LLC:
Managing Partner, October 1998 to date.

University of Southern California
Adjunct Associate Professor in the Department of Economics**,** January 1999 to September 2001.

Deloitte & Touche, LLP:
Partner, Dispute Consulting Services, (Los Angeles), 1998.

Altschuler, Melvoin and Glasser LLP:
Partner, Economics and Litigation Services, (Los Angeles), 1995 to 1998.

Price Waterhouse LLP:
Senior Manager, Manager, Litigation and Corporate Recovery Services Group, (New York and Los Angeles), January 1989 – November 1989, June 1990 to 1995.

Olympia & York Companies (USA):
Assistant VP and Senior Economist, (New York), November 1989 - June 1990.

Baruch College, City University of New York (CUNY):

Instructor and Assistant Professor of Economics, Department of Economics and Finance, 1982-1988; Center for the Study of Business and Government, Research Associate, 1983-1986; U.S. Small Business and Veterans Administrations, Consultant, 1985-1986.

Education

Ph.D., Economics, The University of Chicago.

B.A., History, Economics, The University of Pennsylvania

Publications

Financial Success and Business Ownership among Vietnam and other Veterans (with S. Lustgarten) SBA - 7210 - VA - 83, 1986.

"Schooling and Occupational Choice in 19th Century Urban America", Journal of Economic History, vol. 49, no. 2, June 1989.

"Employment Discrimination Litigation", chapter in Litigation Services Handbook, ed. by Roman Weil, et al., 1995, 2001, 2006, 2012, 2017.

“Employment Discrimination”, chapter in Litigation Support Report Writing, ed. by Jack P. Friedman, et al, 2003.

Paul Grossman, Paul Cane, and Ali Saad, "Lies, Damned Lies, and Statistics: How the Peter Principle Warps Statistical Analysis of Age Discrimination Claims", The Labor Lawyer, vol. 22, no. 3, Winter/Spring 2007, pp. 251-268.

Saad, Ali, "Beyond the Peter Principle – How Unobserved Heterogeneity in Employee Populations Affects Statistical Analysis in Age Discrimination Cases: Application to a Termination/RIF Case", AELC Conference Volume, 2007.

Saad, Ali, "Filling the Data Vacuum in Wage and Hour Litigation: The Example of Misclassification Cases, Emphasis on Class Certification", SIOP Annual Conference Proceedings, 2009.

Saad, Ali, "Wage and Hour Cases - Filling the Data Vacuum: Misclassification Cases and Other Observational Studies", SIOP Annual Conference Proceedings, 2012.

Presentations

Dr. Saad has delivered many presentations at professional conferences, to law firms and to industry groups.

Academic Honors

Finalist, Allan Nevins National Doctoral Dissertation Award
NIMH Doctoral Fellowship, The University of Chicago
Magna Cum Laude, The University of Pennsylvania
Honors in History, Economics, The University of Pennsylvania
Omicron Delta Epsilon, Honor Society in Economics

Professional Affiliations

American Economic Association
American Bar Association (associate membership)

Ali I. Saad, Ph.D.
Attachment to Resume

Last Four Years of Testimony:

In the matter of Scott, et al., v. Airport Management Services, et al., Case No: BC593927 (Superior Court for the State of California, County of Los Angeles) in connection with wage and hour claims. Report filed March 21, 2019. Deposition April 17, 2019.

In the matter of Cortina, et al., v. North American Title Company, Case no. 07 CE CG 01169 JH, (Superior Court of the State of California, County of Fresno), in connection with class action employment matter. Reports filed May 11, 2012, June 25, 2012, and August 13, 19, 21, and 26, 2015. Deposition September 8 and 9, 2015. Trial testimony December 3 and December 10, 2015. Hearing testimony March 14, April 12, May 18, July 12, 2018, September 18, 2018, November 26th, 2018, May 1, 2019.

In the matter of Jewett, et al., v. Oracle America, Inc., Case No: 17-CIV-02669 (Superior Court for the State of California, County of San Mateo) in connection with class action employment discrimination claims. Report filed March 6, 2019. Deposition Testimony March 18, 2019.

In the matter of Smiles, et al., v. Walgreen Company, et al., Case No: RG-17862495 (Superior Court for the State of California) in connection with wage and hour claims. Report filed February 22, 2019, deposition testimony February 25, 2019.

In the matter of Kennard v. Reeves, Case No: BD 604 788 (Superior Court for the State of California) in connection with reasonable compensation issues. Reports filed January 28, 2019 and February 4, 2019. Arbitration Testimony February 22, 2019, May 20, 2019.

In the matter of EEOC, et al., v. Jackson National Life Insurance, et al., Case No: 16-CV-2472-PAB-SKC, (United States District Court for the District of Colorado) in connection with class action discrimination claims. Reports filed August 31, 2018, October 26, 2018 and June 28, 2019. Deposition July 18, 2019.

In the matter of Leanna Delgado v. California Commerce Club, Inc., et al., Case No: BC 586727, (Superior Court for the State of California for the County of Los Angeles) in connection with allegations of age discrimination. Deposition July 25, 2018.

In the matter of Hall v. Rite Aid Corporation, Case No. 37-2009-00087938-CU-OE-CTL, (Superior Court for the State of California for the Country of San Diego) in connection with suitable seating claims. Deposition January 20, 2012, Report filed on June 11, 2018.

In the matter of Harris, et al., v. Union Pacific, Case No: 8:16-cv-381, (United States District Court For the District of Nebraska) in connection with class action discrimination claims. Report filed May 3, 2018. Deposition May 23, 2018.

In the matter of Henderson, et al., v. JP Morgan Chase, Case No. 11-CV-03428 (PLAx), (United States District Court For the Central District of California) in connection with wage and hour claims. Report filed February 26, 2018. Deposition March 21, 2018.

In the matter of Moussouris, et al., v. Microsoft, Case No. 15-CV-1483 (JLR), (United States District Court for the Western District of Washington) in connection with class action claims of gender discrimination in pay, performance and promotions. Reports filed January 5, 2018, April 6, 2018 and April 25, 2018. Deposition January 30, 2018.

In the matter of Creative Artists Agency LLC, v. Martin Lesak, et al., JAMS Ref nos. 120032335, 336 and 337 (Arbitral Tribunal of JAMS) in connection with breach of contract claims. Deposition January 16 and 21, 2018 and March 19, 2018. Arbitration testimony March 26, April 16, and September 7, 2018.

In the matter of Negrete, et al., v. Conagra Foods, Inc., Case No. 2:16-cv-631-FMO-AJW, (United States District Court For the Central District of California) in connection with class action wage and hour claims. Report filed February 28, 2018. Deposition April 18, 2018. Revised report filed on June 18, 2018 to respond to a revised report filed by plaintiff's expert.

In the matter of Woods, et al., v. JFK Memorial Hospital, Inc., Case No. INC 1205209, (Superior Court of California, County of Riverside), in connection with wage and hour claims. Report filed October 13, 2017. Deposition November 29, 2017.

In the matter of Bridewell-Sledge, et al., v. Blue Cross of California, et al., Case No. BC 477 451 c/w BC 481 586, (Superior Court of California, County of Los Angeles), in connection with employment discrimination claims. Reports filed September 7, 2017 and June 13, 2018. Deposition October 30, 2017.

In the matter of Truitt, et al., v. Atlanta Independent School System, Case No. 1:15-cv-4295-SCJ-WEJ, (United States District Court, Northern District of Georgia, Atlanta Division), in connection with allegations of employment discrimination. Report filed August 31, 2017. Deposition September 20, 2017.

In the matter of Williams, et al., v. TGI Fridays, Inc. Case No. 15-cv-0426, (United States District Court, Northern District of Illinois), in connection with allegations of wage and hour violations. Report filed August 4, 2017, deposition August 25, 2017.

In the matter of Victor Cejka, et al., v. Vectrus Systems Corporation, et al. Case No. 15-cv-02418-MEH, (United States District Court, District of Colorado), in connection with alleged employment damages. Report filed July 17, 2017, Rebuttal report filed August 14, 2017. Trial testimony June 18, 2018.

In the matter of EEOC, v. GMRI, Inc. Case No. 15-cv-20561-JAL, (United States District Court, Southern District of Florida, Miami Division), in connection with allegations of employment discrimination. Report filed April 21, 2017, deposition June 8, 2017.

In the matter of Bowerman, et al., v. FAS, Civil Action No. 13-00057-WHO, (United States District Court, Northern District of California), in connection with wage and hour allegations. Rebuttal Report filed April 6, 2017, deposition April 11, 2017.

In the matter of Romero, et al., v. Allstate Insurance Company, et al., Consolidated Cases, Civil Action No. 01-3894-MAK, (United States District Court, Eastern District of Pennsylvania), in connection with employment discrimination allegations. Rebuttal Report filed March 20, 2017, deposition March 29, 2017.

In the matter of Urbano, et al., v. SMG Holdings, et al., Case No.: 5:15-cv-00603-MMM (MRW), (United States District Court for the Central District of California), in connection with wage and hour allegations. Report filed October 14, 2016, deposition October 26, 2016.

In the matter of In re: AutoZone, Inc., Wage and Hour Employment Practices Litigation, Case No.: 3:10-cv-02159-CRB (JSC), (United States District Court for the Northern District of California), in connection with wage and hour allegations. Report filed April 29, 2016, deposition May 27, 2016.

In the matter of EEOC v. Texas Roadhouse, Inc., et al. Case No.:1:11-cv-11732 (United States District Court for the District of Massachusetts), in connection with allegations of age discrimination. Reports filed April 22, 2016 and July 20, 2016. Deposition June 17, 2016; trial testimony January 26, 2017.

In the matter of Luanna Scott, et al., v. Family Dollar Stores, Inc., Case No.:3:08-cv-540 (United States District Court for the Western District of North Carolina), in connection with allegations of gender discrimination. Reports filed January 28, 2016, May 31, 2016. Deposition February 10, 2016.

In the matter of Valerie Horvath v. Western Refining Wholesale, Inc., Case no. Case No.:CIV-ds1311846 (Superior Court for the State of California, County of San Bernardino), in connection with allegations of age discrimination. Report filed November 19, 2015. Deposition January 14, 2016.

In the matter of Curley, et al., v. Savemart, et al. Case no RG13685740, (Superior Court of California, County of Alameda), in connection with class action wage and hour matter. Report filed September 2, 2015. Deposition December 18, 2015 and January 20, 2016.

In the matter of Hurt, et al., v. Commerce Energy, Inc, et al., Case no. 1:12-CV-00758, (United States District Court for the Northern District of Ohio), regarding analysis of data in connection with federal and state class action wage and hour claims. Reports filed May 29 and June 17, 2014. Deposition June 24, 2014. Trial testimony May 22, 2018.

Attachment B: Data and Documents Considered

Attachment B – Data and Documents Considered

I. Court Documents

Amended Complaint, Filed January 25, 2017

OFCCP's Supplemental Objections and Answers to Defendant Oracle America, Inc.'s Interrogatories, Set One (As Amended), Filed October 11, 2017

OFCCP's Motion for Leave to File a Second Amended Complaint, Filed January 22, 2019

Second Amended Complaint, Filed March 8, 2019

Consent Findings and Order, Filed April 25, 2019

Order Adopting Consent Findings Regarding College Recruiting Program Allegations, Filed April 30, 2019

Order Granting in Part and Denying in Part OFCCP's Motion to Compel Historical Data of Comparator Employees, Filed May 16, 2019

II. Depositions and Declarations

a. OFCCP v. Oracle

Videotaped Deposition of Kate Waggoner, May 1, 2019

- Deposition Errata Sheet for the Deposition of Kate Waggoner, Testifying on Behalf of Oracle America, Inc. Taken on May 1, 2019
- Exhibits 1 – 16

b. Jewett, et al. v. Oracle America, Inc.

ORACLE_HQCA_0000398926_Videotaped PMK Deposition of Oracle America, Inc., By: Anje Dodson, July 17, 2018

- ORACLE_HQCA_0000398389 - ORACLE_HQCA_0000398921 (Exhibits 1 – 22)

ORACLE_HQCA_0000399391_Videotaped PMK Deposition of Oracle America, Inc., By: Chad Wayne Kidder, October 23, 2018

- ORACLE_HQCA_0000399379 - ORACLE_HQCA_0000399389 (Exhibits 74-75)

ORACLE_HQCA_0000400584_Videotaped PMK Deposition of Oracle America, Inc., By: Kate Waggoner Volume 1, July 26, 2018 and July 27, 2018

- ORACLE_HQCA_0000399631 - ORACLE_HQCA_0000400354 (Exhibits 23 – 46)

ORACLE_HQCA_0000400868_Videotaped PMK Deposition of Oracle America, Inc., By: Kate Waggoner Volume 2, July 27, 2018

- ORACLE_HQCA_0000400357 - ORACLE_HQCA_0000400577 - (Exhibits 47 – 62) ORACLE_HQCA_0000400579 (Exhibit 64)

CONFIDENTIAL

ORACLE_HQCA_0000399314_Videotaped PMK Deposition of Oracle America, Inc., By: Kristina Karstensson Edwards, October 16, 2018

- ORACLE_HQCA_0000399311 (Exhibit 57); ORACLE_HQCA_0000399190 - ORACLE_HQCA_0000399291 (Exhibits 65 – 73)

ORACLE_HQCA_0000544833_Declaration of Anshuman Sharma in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 11, 2019

ORACLE_HQCA_0000544765_Declaration of Ashlee Kling in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed February 26, 2019

ORACLE_HQCA_0000544752_Declaration of Balaji Bashyam in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 4, 2019

ORACLE_HQCA_0000544776_Declaration of Barbara Lundhild in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 1, 2019

ORACLE_HQCA_0000545106_Declaration of Campbell Webb in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 5, 2019

ORACLE_HQCA_0000544762_Declaration of Chad Kidder in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment, executed January 11, 2019

ORACLE_HQCA_0000544758_Declaration of Chad Kidder in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 1, 2019

ORACLE_HQCA_0000544820_Declaration of Chintu Patel in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 1, 2019

ORACLE_HQCA_0000544837_Declaration of Darryl Tewes in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 1, 2019

ORACLE_HQCA_0000544768_Declaration of Denise Lee in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 15, 2019

ORACLE_HQCA_0000544746_Declaration of Joseph Albowicz in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 10, 2019

ORACLE_HQCA_0000544846_Declaration of Kate Waggoner in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 16, 2019

ORACLE_HQCA_0000544772_Declaration of Michael Leftwich in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed February 28, 2019

ORACLE_HQCA_0000544827_Declaration of Richard Sarwal in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 5, 2019

ORACLE_HQCA_0000607281_Declaration of Steven Miranda in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 17, 2019

ORACLE_HQCA_0000544843_Declaration of Vickie Thrasher in Support of Defendant Oracle America, Inc.'s Motion for Summary Judgment or, in the alternative, Summary Adjudication, executed January 9, 2019

ORACLE_HQCA_0000545111_Declaration of Vivian Wong in Support of Defendant Oracle America, Inc.'s Opposition to Plaintiffs' Motion for Class Certification, executed March 1, 2019

III. Oracle Documents

ORACLE_HQCA_0000000407_Global Compensation Training - 2011 Managing Pay Final (Native).PPTX

ORACLE_HQCA_0000000464_USEmployeeHandbook.pdf

ORACLE_HQCA_0000014418_IRC1757825.pdf

ORACLE_HQCA_0000015152_IRC 1727737.pdf

ORACLE_HQCA_0000020125_Sourcing Handbook.pdf

ORACLE_HQCA_0000021914_Document1.pdf

ORACLE_HQCA_0000021918_Updated College Recruiting ProcessOverview.pdf

ORACLE_HQCA_0000021930_College Recruiting Internal Website - Storeyboard Template.pdf

ORACLE_HQCA_0000021971_HM Internal Site Changes.pdf

ORACLE_HQCA_0000021994_COMPLETE LIST OF SCHOOLS.pdf

ORACLE_HQCA_0000021999_Directions for Qualifying.pdf

ORACLE_HQCA_0000022000_Hardware PhDs list of schools.pdf

ORACLE_HQCA_0000022003_Oracle College Recruiting Resourcing Outline for 2011 FY.pdf

ORACLE_HQCA_0000022006_Resourcing Guidelines.pdf

ORACLE_HQCA_0000022013_Sourcing from Resume Drop Sites.pdf

ORACLE_HQCA_0000022470_BDC Pre-screen (6).pdf

ORACLE_HQCA_0000022721_EvaluationForm.pdf

ORACLE_HQCA_0000022736_ncg_undergrad_screening_rev2.pdf

ORACLE_HQCA_0000022905_HQCA Job Descriptions.xlsx

ORACLE_HQCA_0000022906 Career Level Guidelines Matrix Oracle.xls

ORACLE_HQCA_0000022922_Annual Stock Focal Process updatedJune13 updated.pdf

ORACLE_HQCA_0000022940_Equity_Award_Impact_On_Offer_140526.pdf

ORACLE_HQCA_0000022954 PD Promotion Template.pdf

ORACLE_HQCA_0000022959_FY14 Stock Grant Eligibility.pdf

ORACLE_HQCA_0000022967 IC Promotion Template.pdf

ORACLE_HQCA_0000022968 Management Promotion Template.pdf

ORACLE_HQCA_0000022973_FY14 Stock Grant Eligibility.pdf

ORACLE_HQCA_0000022980_PM Global Training Schedule FY14-15Announcement Final.pdf

ORACLE_HQCA_0000022984 Mgr Prod Dev Promotion Template Feb-09.docx

ORACLE_HQCA_0000022987_Product Development IC Promotion Template_2011.pdf

ORACLE_HQCA_0000022992_Perf Appr Comm Plan & Launch FY14 Year-End Perf Appr & FY15 GoalSetting Process EEs- 6.23.14_v2.pdf

ORACLE_HQCA_0000023006 PD Manag Promotion Template.pdf

ORACLE_HQCA_0000023012_Native_TM85_Managers_Preparing_Talent_Review_ Content_Fusion.pptx

ORACLE_HQCA_0000024196_Recruiting Support Staff (RSS) Training 09.17.2013 (Native).PPT

ORACLE_HQCA_0000024950_FY14 Recruiter Discretionary bonus plan - Admin Guidelines NA - Recruiter (Native).xlsx

ORACLE_HQCA_0000024951_1-Document.pdf

ORACLE_HQCA_0000024952_2-Document.pdf

ORACLE_HQCA_0000024953_3-Document.pdf

ORACLE_HQCA_0000040960_Self ID Form.pdf

ORACLE_HQCA_0000041852_Recruiting Operations Review (Joyce version 032414 (Native).PPTX

ORACLE_HQCA_0000041864_Oracle Performance Appraisal 20170810.pdf

ORACLE_HQCA_0000042091_MASTER US Manager Orientation 1201 (Native).PPTX

ORACLE_HQCA_0000042095_Customer Services CompTraining 3 15 final (Native).PPT

ORACLE_HQCA_0000042098_Customer Services Comp Training 3 15 - w_new arrows (Native).PPTX

ORACLE_HQCA_0000042101_MASTER US Manager Orientation 1202 lg (Native).PPTX

ORACLE_HQCA_0000053186_Global Referral Team_Knowledge Sharing_Sept 2016 (Native).PPTX

ORACLE_HQCA_0000056239_HR REFRESH_CWB_TRAINING_APR2011v3_Updated_June2013V3 (Native).PPTX

ORACLE_HQCA_0000056276_FWCBONUSMgrTrainingR4newCorpTemplate.pdf

ORACLE_HQCA_0000056566_New Recruiter OnboardingPresentation (Native).PPT

ORACLE_HQCA_0000056741_NCG & Campus Recruiting2 (Native).PPT

ORACLE_HQCA_0000056957_CWB New Manager Training (Native).PPT

ORACLE_HQCA_0000062712_HR Global Approval Matrix_HR Version_01_Nov_2014 (Native).XLSX

ORACLE_HQCA_0000364183_native.pptx

ORACLE_HQCA_0000364184.pdf

ORACLE_HQCA_0000364186.pdf

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ORACLE_HQCA_0000364213.pdf

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ORACLE_HQCA_0000364223.pdf

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ORACLE_HQCA_0000364272_native.pptx

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ORACLE_HQCA_0000364301.pdf

ORACLE_HQCA_0000414169_Oracle Patent Award Program effective 6-26-14.pdf

ORACLE_HQCA_0000414171_US Equity Choice FAQ.pdf

ORACLE_HQCA_0000414176_lisa.hanson@oracle.com_9478290_116388.pdf

ORACLE_HQCA_0000414177_lisa.hanson@oracle.com_9517664_54906.pdf

ORACLE_HQCA_0000414178_lisa.hanson@oracle.com_9517664_58670.pdf

ORACLE_HQCA_0000414179_lisa.hanson@oracle.com_9517664_60184.pdf

ORACLE_HQCA_0000414367_suzanne.castillo@oracle.com_6600384_35120.pdf

ORACLE_HQCA_0000414368_Oracle Patent FACT Sheet 2013.pdf

ORACLE_HQCA_0000414372_patent Primer 07-07-2014.pptx

ORACLE_HQCA_0000416489_Equity0Choice0FAQ[1].pdf

ORACLE_HQCA_0000416494_Equity Choice FAQ.pdf

ORACLE_HQCA_0000416500_[redacted]@oracle.com_4431785_41527.pdf

ORACLE_HQCA_0000416510_WrittenCloseOut_[redacted].pdf

ORACLE_HQCA_0000416512_RE Written Investigation Follow Up_SD.pdf

ORACLE_HQCA_0000416515_WrittenCloseOut_[redacted].pdf

ORACLE_HQCA_0000416517_Equal Pay Inquiry_self_[redacted].pdf

ORACLE_HQCA_0000416518_[redacted]@oracle.com_28936679_25.pdf

ORACLE_HQCA_0000416519_[redacted]@oracle.com_2753331_53757.pdf

ORACLE_HQCA_0000416520_[redacted] 2017.09.19 DFEH RTS.pdf

ORACLE_HQCA_0000416526_2000 LTIP 02 01 2018.pdf

ORACLE_HQCA_0000416561_2000 LTIP 05 31 2011.pdf

ORACLE_HQCA_0000416603_2000 LTIP 06 16 2014.pdf

ORACLE_HQCA_0000416646_2000 LTIP 6 30 16.pdf

ORACLE_HQCA_0000416684_2000 LTIP Pro 020118.pdf

ORACLE_HQCA_0000416719_2000 Plan 06302016.pdf

ORACLE_HQCA_0000416757_2000 Plan 12012017.pdf

ORACLE_HQCA_0000416793_2000LTPLANPRO14.pdf

ORACLE_HQCA_0000416837_Investigation Results_[redacted]_12.7.17.pdf

ORACLE_HQCA_0000416857_Amended_and Restated_2000_LTIP_2.1.18.pdf

ORACLE_HQCA_0000416892_Amended_and Restated_2000_LTIP_5.31.11.pdf

ORACLE_HQCA_0000416934_Amended_and Restated_2000_LTIP_6.14.14.pdf

ORACLE_HQCA_0000416978_Amended_and Restated_2000_LTIP_6.30.16.pdf

ORACLE_HQCA_0000417016_Amended_and Restated_2000_LTIP_12.1.17.pdf

ORACLE_HQCA_0000417061_confirm equal pay.pdf

ORACLE_HQCA_0000417062_Question on Benefits Compensation.pdf

ORACLE_HQCA_0000417063_RE quick call.pdf

ORACLE_HQCA_0000417316_shauna.holman.harries@oracle.com_9515916_112783.pdf

ORACLE_HQCA_0000417308- 417309.tif

ORACLE_HQCA_0000417318_Global Rehire Guidelines FY19 -20180913.pdf

ORACLE_HQCA_0000417382- 417642.pdfs: Job Descriptions

IV. OFCCP Produced Documents

DOL000001395-000001406.pdf

2017.10.26 [OFCCP] Attachment-DOL000039877.pdf

2017.10.26 [OFCCP] Attachment-OFCCP v Oracle - Additional Data Needed Re Statistics.docx

Backup to Second Amended Complaint:

- basepay_over_time.do
- Directive 310- Calculating Back Pay.pdf
- DOL 000040761 (SAC Tables 1-6).xlsx
- OFCCP v. Oracle; OALJ Case No. 2017-OFC-00006, SAC Tables 1-6.pdf
- ORACLE Damage Calculation.xlsx
- Oracle_Combine_Data.do
- Oracle_ordered_logits_assignment.do
- Oracle_Regressions.do
- rr-18-07.pdf
- Starting Salary.do
- wage changes.do

DOL000004722.pdf

DOL000005298-5330.pdf

DOL000026401.xlsx

DOL000026402.xlsx

DOL000026403.xlsx

DOL000030699.pdf

DOL000030705.pdf

DOL000031068.pdf

DOL000031113.pdf

DOL000031116.pdf

DOL000031119.pdf

DOL000031233.pdf

DOL000031245.pdf

DOL000031294.pdf

DOL000031345.pdf

DOL000031349.pdf

DOL000031357.pdf

DOL000031952.pdf

DOL000032196.xlsx

DOL000032197.xlsx

DOL000032198.xlsx

DOL000039442-39447.pdf

V. Data Correspondence

2017.10.11 [Oracle] Connell Ltr to [OFCCP] Bremer re prod of Database, Add'l Disc.pdf

2017.10.26 [OFCCP] [Pilotin] Email to [Oracle] Connell, et al re Info on OFCCP Analysis

2017.10.31 [Oracle] Horton email to [OFCCP] w FTP Oracle doc prod 13, 14, 15 and 16.pdf

2017.10.31 [Oracle] Horton email-attch-Hard Disk Drive Production - Bates Number Index.xlsx

2017.11.14 [OFCCP] Herold Ltr to [Oracle] Connell w Qs 10.11.2017 data prod.pdf

2017.11.28 [Oracle] Pitcher ltr to [OFCCP] re produced data.pdf

2017.12.05 [OFCCP] Pilotin Ltr to [Oracle] Connell Add'l Qs re 10.11.2017 Data Prod.pdf

2017.12.08 [Oracle] Pitcher Ltr to [OFCCP] Pilotin re Resps to Qs re 10.11.2017 Data Prod.pdf

2017.12.18 [Oracle] Pitcher Ltr to [OFCCP] Pilotin resp 12.05.2017 ltr Qs re data.pdf

2018.06.08 [OFCCP] Bremer ltr to [Oracle] Connell re data requests (DOC2....pdf

2018.06.08 [REDACTED] [OFCCP] Bremer ltr to [Oracle] Connell w Data Qs (DOC240).pdf

2018.06.29 [REDACTED] [Oracle] Connell ltr to [OFCCP] Bremer in resp 2018.06.08 dat....pdf

2018.06.29 [REDACTED] [Oracle] Pitcher ltr to [OFCCP] Bremer in resp 2018.06.08 dat....pdf

2018.07.06 [REDACTED] [OFCCP] Bremer ltr to [Oracle] Pitcher re Data Que....pdf

2018.07.13 [Oracle] [Pitcher] Ltr to [OFCCP] Bremer re Resp to 07.06.201....pdf

2019-05-24 Daquiz Letter to Mr. Parker.pdf

2019-06-13 Letter to W. Parker from Daquiz.pdf

2019.02.19 [Oracle] [Parker] Ltr to [Court] ALJ Clark re Met and Conferred on Schedule.pdf

2019.04.11 [Oracle] Parker Ltr to [OFCCP] Daquiz re Resps to Amended RFP....pdf

2019.04.12 [Oracle] Mantoan ltr to Bremer re data production.pdf

2019.04.22 [Oracle] Parker ltr to [OFCCP] Daquiz.pdf

2019.04.26 Daquiz email to Parker RE OFCCP v Oracle, Case No 2017-OFC-00....pdf

2019.05.06 [OFCCP] Daquiz Email to [Oracle] Parker re Oracle Resending N....pdf

2019.05.14 [Oracle] Fuad Ltr to [OFCCP] Daquiz re Follow Up on May 3 Ltr....pdf

2019.06.07 [Oracle] Pitcher Ltr to [OFCCP] Bremer re Supplemental Data Production.pdf

2019.07.03 Mantoan Ltr to Bremer re Additional Information re Previously Produced Data.pdf

VI. Data

ORACLE_HQCA_0000062856_Thomas Kurian HC information for Orrick v4 (USA only)_native.xlsx

ORACLE_HQCA_0000062858 (AAP_Location List.xlsx).xlsx

ORACLE_HQCA_0000062859_Candidate Offers.xlsx

ORACLE_HQCA_0000062862_Contact Info Group I Fusion.xlsx

ORACLE_HQCA_0000062863_Contact Info Group I Taleo.xlsx

ORACLE_HQCA_0000062864_Contact Info Group I.xlsx

ORACLE_HQCA_0000062865_Group I iRec docs.xlsx

ORACLE_HQCA_0000062866_Group I Taleo - File List - By Candidate.CSV

ORACLE_HQCA_0000062867_Group I Taleo - File List - By Requisition.CSV

ORACLE_HQCA_0000070721_AllEarnings.xlsx

ORACLE_HQCA_0000070722_AllEarnings2.xlsx

ORACLE_HQCA_0000070723_Application - Candidate Skills.xlsx

ORACLE_HQCA_0000070724_Application - CSW History.xlsx

ORACLE_HQCA_0000070725_Application - Education.xlsx

ORACLE_HQCA_0000070726_Application - Experience.xlsx

ORACLE_HQCA_0000070727_Application - History.xlsx

ORACLE_HQCA_0000070728_Application - Source.xlsx

ORACLE_HQCA_0000070729_Application Data.xlsx

ORACLE_HQCA_0000070730_Appraisal_Audit_All_Data.xlsx

ORACLE_HQCA_0000070731_Candidate - Demographics.xlsx

ORACLE_HQCA_0000070732_Candidate - Languages.xlsx

ORACLE_HQCA_0000070733_Candidate - Referrals.xlsx

ORACLE_HQCA_0000070734_Candidate Preferences - Job Field.xlsx

ORACLE_HQCA_0000070735_Candidate Preferences - Location.xlsx

ORACLE_HQCA_0000070736_Candidate Preferences - Organization.xlsx

ORACLE_HQCA_0000070737_CC Data Dictionary.xlsx

ORACLE_HQCA_0000070738_Emp_Personal_Experience_Qualification_Assign_Details.xlsx

ORACLE_HQCA_0000070739_File Attachments - By Candidate.xlsx

ORACLE_HQCA_0000070740_File Attachments - By Requisition.xlsx

- Attachments referenced in file; produced Volume13

ORACLE_HQCA_0000070741_gsi_comp_history.xlsx

ORACLE_HQCA_0000070742_gsi_cwb_audit.xlsx

ORACLE_HQCA_0000070743_gsi_cwb_detail.xlsx

ORACLE_HQCA_0000070744_gsi_focal_only_audit.xlsx

ORACLE_HQCA_0000070745_hcm_wfc_audit.xlsx

ORACLE_HQCA_0000070746_hcm_wfc_details.xlsx

ORACLE_HQCA_0000070747_HQCA_IREC_DATA.xlsx

- Attachments referenced in file; produced Volume13

ORACLE_HQCA_0000070748_Merged Assignment History, Medicare and Sal Admin.xlsx

ORACLE_HQCA_0000070749_Requisition - Collaborators Data.xlsx

ORACLE_HQCA_0000070750_Requisition - Description and Qualification Data.xlsx

ORACLE_HQCA_0000070751_Requisition - Other Locations.xlsx

ORACLE_HQCA_0000070752_Requisition Data.xlsx

ORACLE_HQCA_0000070753_Talent_Review_Audit.xlsx

ORACLE_HQCA_0000070754_Talent_Review_Audit_Notes.xlsx

ORACLE_HQCA_0000070755_us_audit_adhoc_comp_total.xlsx

ORACLE_HQCA_0000070756_us_audit_adhoc_comp_wf.xlsx

ORACLE_HQCA_0000070757_us_audit_adhoc_comp_wf_attach.xlsx

- Attachments referenced in file; produced Volume13

ORACLE_HQCA_0000070758_Z_PromApproverAttachmentKey.xlsx

- Attachments referenced in file; produced Volume13

ORACLE_HQCA_0000070759_Z_PromApproverMtxRpt.xlsx

ORACLE_HQCA_0000360321_H1B.xlsx

ORACLE_HQCA_0000364082-0000364182 (2013-2016 Organization Hierarchy Files)

ORACLE_HQCA_0000403939_AllEarnings_Updated_Population.xlsx

ORACLE_HQCA_0000404317_AllEarnings_Supplemental_Production.xlsx

ORACLE_HQCA_0000581268_gsi_comp_history_Updated_Population.xlsx

ORACLE_HQCA_0000581269_gsi_cwb_audit_Updated_Population.xlsx

ORACLE_HQCA_0000581270_gsi_cwb_details_Updated_Population.xlsx

- Attachments referenced in file: ORACLE_HQCA_0000581274 to ORACLE_HQCA_0000581347

ORACLE_HQCA_0000581271_us_audit_adhoc_comp_total_Updated_Population.xlsx

ORACLE_HQCA_0000581272_us_audit_adhoc_comp_wf_attach_Updated_Population.xlsx

- Attachments referenced in file: ORACLE_HQCA_0000581348 to ORACLE_HQCA_0000581392

ORACLE_HQCA_0000581273_us_audit_adhoc_comp_wf_Updated_Population.xlsx

ORACLE_HQCA_0000437695_CF_116190287_503759264.xls

ORACLE_HQCA_0000581393_AppraisalData_Supplemental Production.xlsx

ORACLE_HQCA_0000581394_AppraisalData_Updated_Population.xlsx

ORACLE_HQCA_0000581395_Emp_Personal_Experience_Qualification_Assign_Details_Supplemental_Production.xlsx

ORACLE_HQCA_0000581396_Emp_Personal_Experience_Qualification_Assign_Details_Supplemental_Updated_Population.xlsx

ORACLE_HQCA_0000581397_hcm_wfc_audit_Supplemental_Production.xlsx

ORACLE_HQCA_0000581398_hcm_wfc_audit_Updated_Population.xlsx

ORACLE_HQCA_0000581399_hcm_wfc_details_Supplemental_Production.xlsx

- Attachments referenced in file: ORACLE_HQCA_0000581415 to ORACLE_HQCA_0000581424

ORACLE_HQCA_0000581400_hcm_wfc_details_Updated_Population.xlsx

- Attachments referenced in file: ORACLE_HQCA_0000581410 to ORACLE_HQCA_0000581414

ORACLE_HQCA_0000581401_Merged_Assignment_History_Medicare_and_Sal_Admin_Supplemental_Production.xlsx

ORACLE_HQCA_0000581402_Merged_Assignment_History_Medicare_and_Sal_Admin_Updated_Population.xlsx

ORACLE_HQCA_0000581403_Stock_Data_Product_Statement_Combined.xlsx

ORACLE_HQCA_0000581404_Talent_Review_Audit_Notes_Supplemental_Production.xlsx

ORACLE_HQCA_0000581405_Talent_Review_Audit_Notes_Updated_Population.xlsx

ORACLE_HQCA_0000581406_Talent_Review_Audit_Supplemental_Production.xlsx

ORACLE_HQCA_0000581407_Talent_Review_Audit_Updated_Population.xlsx

ORACLE_HQCA_0000581408_TalentProfile_Supplemental_Production.xlsx

ORACLE_HQCA_0000581409_TalentProfile_Updated_Population.xlsx

ORACLE_HQCA_0000581425_iRec_apl_employment_history_Supplemental_Production.xls

ORACLE_HQCA_0000581426_iRec_apl_employment_history_Updated_Population.xls

ORACLE_HQCA_0000581427_iRec_apl_qualifications_Supplemental_Production.xls

ORACLE_HQCA_0000581428_iRec_apl_qualifications_Updated_Population.xls

ORACLE_HQCA_0000581429_iRec_applicant_Profiles_Supplemental_Production.xls

ORACLE_HQCA_0000581430_iRec_applicant_Profiles_Updated_Population.xls

ORACLE_HQCA_0000581431_iRec_hqca_vacancies_Supplemental_Production.xls

ORACLE_HQCA_0000581432_iRec_hqca_vacancies_Updated_Population.xls

ORACLE_HQCA_0000581433_iRec_offer_approval_comm_history_Supplemental_Production.xls

ORACLE_HQCA_0000581434_iRec_offer_approval_comm_history_Updated_Population.xls

ORACLE_HQCA_0000581435_iRec_offer_approval_history_Supplemental_Production.xls

ORACLE_HQCA_0000581436_iRec_offer_approval_history_Updated_Population.xls

ORACLE_HQCA_0000581437_iRec_offer_candidates_Supplemental_Production.xls

ORACLE_HQCA_0000581438_iRec_offer_candidates_Updated_Population.xls

ORACLE_HQCA_0000581439_iRec_offer_icds_Supplemental_Production.xls

ORACLE_HQCA_0000581440_iRec_offer_icds_Updated_Population.xls

ORACLE_HQCA_0000581441_iRec_offer_status_history_Supplemental_Production.xls

ORACLE_HQCA_0000581442_iRec_offer_status_history_Updated_Population.xls

ORACLE_HQCA_0000581443_iRec_offer_workflow_attachments_Supplemental_Production.xls

- Attachments at ORACLE_HQCA_0000590597 to ORACLE_HQCA_ 0000590815

ORACLE_HQCA_0000581444_iRec_offer_workflow_attachments_Updated_Population.xls

- Attachments at ORACLE_HQCA_0000590818 to ORACLE_HQCA_0000591452

ORACLE_HQCA_0000581445_iRec_other_attachments_Supplemental_Production.xls

- Attachments referenced in file: ORACLE_HQCA_0000591454 to ORACLE_HQCA_0000591464

ORACLE_HQCA_0000581446_iRec_other_attachments_Updated_Population.xls

- Attachments referenced in file: ORACLE_HQCA_0000591465 to ORACLE_HQCA_0000591525

ORACLE_HQCA_0000581447_iRec_Resumes_Supplemental_Production.xls

- Attachments referenced in file: ORACLE_HQCA_0000591526 to ORACLE_HQCA_0000592522

ORACLE_HQCA_0000581448_iRec_Resumes_Updated_Population.xls

- Attachments referenced in file: ORACLE_HQCA_0000592523 to ORACLE_HQCA_0000595455

ORACLE_HQCA_0000581449-0000581466: 2017-2018 Organization Hierarchy Files

ORACLE_HQCA_0000581470_CWB_international workbench _International_Transfer_Population.xlsx

ORACLE_HQCA_0000581471_Salary_Range_History.xlsx

ORACLE_HQCA_0000581472_Application_Candidate Skills_Updated Population.csv

ORACLE_HQCA_0000581473_Application_CSW History_Updated Population.csv

ORACLE_HQCA_0000581474_Application _Education_Updated Population.csv

ORACLE_HQCA_0000581475_Application _Experience_Updated Population.csv

ORACLE_HQCA_0000581476_Application_ History_Updated Population.csv

ORACLE_HQCA_0000581477_Application _Source_Updated Population.csv

ORACLE_HQCA_0000581478_Application Data_Updated Population.csv

ORACLE_HQCA_0000581479_Candidate_ Demographics_Updated Population.csv

ORACLE_HQCA_0000581480_Candidate_ GovtClearance_Updated Population.csv

ORACLE_HQCA_0000581481_Candidate_ Languages_Updated Population.csv

ORACLE_HQCA_0000581482_Candidate_Preferences_ Job Field_Updated Population.csv

ORACLE_HQCA_0000581483_Candidate_Preferences_ Location_Updated Population.csv

ORACLE_HQCA_0000581484_Candidate_ Preferences_ Organization_Updated Population.csv

ORACLE_HQCA_0000581485_Candidate _Referrals_Updated Population.csv

ORACLE_HQCA_0000581486_ Files_ by Requisition_Updated Population.csv

- Attachments referenced in file and in ORACLE_HQCA_0000581491: ORACLE_HQCA_0000581492 to ORACLE_HQCA_0000588418

ORACLE_HQCA_0000581487_Requisition_ Collaborators Data_Updated Population.csv

ORACLE_HQCA_0000581488_Requisition_Description and Qualification Data_Updated Population.csv

ORACLE_HQCA_0000581489_Requisition_ Other Locations_Updated Population.csv

ORACLE_HQCA_0000581490_Requisition Data_Updated Population.csv

ORACLE_HQCA_0000581491_ Files_ by Candidate_Updated Population.csv

ORACLE_HQCA_0000588420_Application_Candidate_Skills_Supplemental_Production.csv

ORACLE_HQCA_0000588421_Application_CSW_History_Supplemental_Production.csv

ORACLE_HQCA_0000588422_Application_Data_Supplemental_Production.csv

ORACLE_HQCA_0000588423_Application_Education_Supplemental_Production.csv

ORACLE_HQCA_0000588424_Application_Experience_Supplemental_Production.csv

ORACLE_HQCA_0000588425_Application_History_Supplemental_Production.csv

ORACLE_HQCA_0000588426_Application_Source_Supplemental_Production.csv

ORACLE_HQCA_0000588427_Candidate_Demographics_Supplemental_Production.csv

ORACLE_HQCA_0000588428_Candidate_Languages_Supplemental_Production.csv

ORACLE_HQCA_0000588429_Candidate_Preferences_Job_Fields_Supplemental_Production.csv

ORACLE_HQCA_0000588430_Candidate_Preferences_Location_Supplemental_Production.csv

ORACLE_HQCA_0000588431_Candidate_Preferences_Organization_Supplemental_Production.csv

ORACLE_HQCA_0000588432_Candidate_Referrals_Supplemental_Production.csv

ORACLE_HQCA_0000588433_Files_by_Candidate_Supplemental_Production.csv

ORACLE_HQCA_0000588434_Files_by Requisition_Supplemental_Production.csv

- Attachments referenced in file and in ORACLE_HQCA_0000588433: ORACLE_HQCA_0000588439 to ORACLE_HQCA_0000590595

ORACLE_HQCA_0000588435_Requisition_Collaborators_Data_Supplemental_Production.csv

ORACLE_HQCA_0000588436_Requsition_Data_Supplemental_Production.csv

ORACLE_HQCA_0000588437_Requisition_Description_and_Qualification_Data_Supplemental_Production.csv

ORACLE_HQCA_0000588438_Requisition_Other_Locations_Supplemental_Production.csv

ORACLE_HQCA_0000590596_RAA Job Function.xlsx

ORACLE_HQCA_0000591453_CC Data Dictionary Supplement.xlsx

ORACLE_HQCA_0000597171_AppraisalData_Historical_Population.xlsx

ORACLE_HQCA_0000597172_Emp_Personal_Experience_Qualification_Assign_Details_Historical_Population.xlsx

ORACLE_HQCA_0000597173_gsi_comp_history_Historical_Population.xlsx

ORACLE_HQCA_0000597174_gsi_cwb_details_Historical_Population.xlsx

- Available attachments at ORACLE_HQCA_0000597188 to ORACLE_HQCA_0000597680

ORACLE_HQCA_0000597175_Merged Assignment History, Medicare and Sal Admin_Historical_Population.xlsx

ORACLE_HQCA_0000597176_iRec_apl_employment_history_Historical_Population.xls

ORACLE_HQCA_0000597177_iRec_apl_qualifications_Historical_Population.xls

ORACLE_HQCA_0000597178_iRec_applicant_profiles_Historical_Population.xls

ORACLE_HQCA_0000597179_iRec_hqca_vacancies_Historical_Population.xls

ORACLE_HQCA_0000597180_iRec_offer_approval_comm_history_Historical_Population.xls

ORACLE_HQCA_0000597181_iRec_offer_approval_history_Historical_Population.xls

ORACLE_HQCA_0000597182_iRec_offer_candidates_Historical_Population.xls

ORACLE_HQCA_0000597183_iRec_offer_icds_Historical_Population.xls

ORACLE_HQCA_0000597184_iRec_offer_status_history_Historical_Population.xls

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- Available attachments at ORACLE_HQCA_0000595456 to ORACLE_HQCA_0000595512

ORACLE_HQCA_0000597187_iRec_resumes_Historical_Population.xls

- Available attachments at ORACLE_HQCA_0000595513 to ORACLE_HQCA_0000597170

ORACLE_HQCA_0000597892_AllEarnings_Historical_Population.xlsx

ORA_OFCCP018 Index.xlsb

ORA_OFCCP026.dat

ORA_OFCCP027.dat

ORA_OFCCP028.dat

ORA_OFCCP029.dat

ORA_OFCCP030.dat

ORA_OFCCP031.dat

Resumes, hiring documents, promotion templates, dive and save templates, and other compensation related attachments in Productions 26-32

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Attachment C: Tables

Employee Counts for HQCA

- INFTECH, PRODEV, and SUPP Job Functions -

Year	# of Unique Employees	# Protected Group
2013	5,713	3,996
2014	5,662	3,980
2015	5,687	4,020
2016	5,605	4,019
2017	5,514	3,978
2018	5,348	3,886
2013-2014	6,300	4,410
2013-2018	8,465	6,035

The Distribution of Total Compensation in 2014 by Career Level

- Full-Time, Full-Year Employees -

Career Level	N	Mean	Minimum	1st Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	99th Percentile	Maximum
IC0	2	[redacted]									
IC1	8										
IC2	221										
IC3	664										
IC4	1,219										
IC5	844										
IC6	81										
M1	2										
M2	124										
M3	419										
M4	397										
M5	316										
M6	178										
M7	22										
ALL	4,497										

The Distribution of Total Compensation in 2014 by Job Title

- 15 Most Populated Job Titles Across PRODEV, INFTECH, and SUPP -

- Full Time, Full Year Employees -

Job Title	N	Mean	Minimum	1st Percentile	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	99th Percentile	Maximum
Software Development VP	119	[redacted]									
Software Development Snr Director	188										
Software Development Director	247										
Software Developer 5	375										
Software Development Snr Manager	316										
Software Development Manager	87										
Product Manager/Strategy 5-ProdDev	138										
Applications Developer 5	154										
Software Developer 4	611										
Product Manager/Strategy 4-ProdDev	82										
Applications Developer 4	145										
Software Developer 3	295										
Software Developer 2	131										
Applications Developer 3	133										
Technical Analyst 4-Support	75										

The OFCCP's NOV Analysis Shows No Systematic Pattern of Statistically Significant Results for Women vs. Men

- OFCCP Presented the Three Statistically Significant Results and Ignored Thirteen Job Functions With Insignificant Results -

	Female vs. Male			
Job Function	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
ADMIN	130	117	8.68%	1.42
ALLROLES	33	15	0.55%	0.04
BUSPRAC	228	139	-0.16%	-0.07
CONS	52	10	-3.08%	-0.75
FACS	54	12	-6.90%	-1.55
FINANCE	282	147	2.44%	1.61
HR	72	58	6.28%	1.17
INFTECH	484	133	-3.33%	-2.61
LEGAL	68	41	1.64%	0.84
MANUDIST	50	17	5.24%	0.92
MARKET	301	177	-2.28%	-1.26
PRESALES	229	40	-2.66%	-1.53
PRODEV	4,315	1,207	-3.91%	-8.24
SALES	827	227	-1.52%	-1.75
SUPP	248	47	-7.35%	-3.67
TRAIN	46	22	5.15%	0.90

Model controls for female, standard job title (ones with less than 5 employees are grouped together), part-time/full-time, exempt status, time in company, and estimated previous experience (age minus 18).

The OFCCP's NOV Analysis Shows No Systematic Pattern of Statistically Significant Results for Asians and African Americans

- OFCCP Presented the One Statistically Significant Results and Ignored Fifteen Job Functions With Insignificant Results -

	Asian vs. White				African American vs. White			
Job Function	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
ADMIN	130	27	0.03%	0.01	130	4		
ALLROLES	33	18	-14.10%	-0.81	33	2		
BUSPRAC	228	67	2.06%	0.84	228	4		
CONS	52	38	4.31%	0.95	52	3		
FACS	54	10	2.06%	0.42	54	3		
FINANCE	282	131	0.25%	0.14	282	5	-6.12%	-1.09
HR	72	21	0.84%	0.17	72	2		
INFTECH	484	308	-0.91%	-0.63	484	9	-0.34%	-0.08
LEGAL	68	20	-2.93%	-1.32	68	4		
MANUDIST	50	15	5.63%	0.75	50	5	1.47%	0.14
MARKET	301	88	1.35%	0.64	301	3		
PRESALES	229	87	4.38%	2.76	229	8	3.15%	0.83
PRODEV	4,315	3,086	-3.35%	-6.37	4,315	27	-5.23%	-2.00
SALES	827	130	-1.96%	-1.80	827	30	-0.71%	-0.34
SUPP	248	192	1.65%	0.69	248	3		
TRAIN	46	20	-7.59%	-1.15	46	1		

Model controls for race, standard job title (ones with less than 5 employees are grouped together), part-time/full-time, exempt status, time in company, and estimated previous experience (age minus 18).

Organization Counts for HQCA

- INFTECH, PRODEV, and SUPP Job Functions -

Year	# of Unique Organizations
2013	681
2014	639
2015	634
2016	601
2017	528
2018	497
2013-2014	733
2013-2018	1,039

Modified Regression Analysis of Total Compensation by Gender or Race Shows No Systematic Pattern of Statistically Significant Results Across Years or Job Function

		Female vs. Male				Asian vs. White				African American vs. White			
Job Function	**Year**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
INFTECH	2013	440	124	-3.35%	-1.75								
	2014	447	124	-3.42%	-1.49								
	2015	556	136	-3.60%	-1.67								
	2016	604	143	-0.86%	-0.41								
	2017	544	132	-3.08%	-1.33								
	2018	521	127	-5.72%	-2.37								
PRODEV	2013	3,901	1,123	-1.75%	-2.12	3,783	2,746	-1.17%	-1.36	1,062	25	-0.90%	-0.17
	2014	3,872	1,110	-1.31%	-1.39	3,756	2,764	-0.94%	-0.93	1,018	26	-2.81%	-0.46
	2015	3,814	1,081	-1.41%	-1.43	3,687	2,750	-0.54%	-0.51	962	25	-6.49%	-1.05
	2016	3,809	1,055	-1.42%	-1.48	3,659	2,778	-0.40%	-0.39	910	29	-7.27%	-1.27
	2017	3,816	1,052	-0.96%	-0.93	3,669	2,820	-1.03%	-0.92	876	27	-6.53%	-1.04
	2018	3,585	999	-0.82%	-0.76	3,435	2,662	-2.52%	-2.11	800	27	-7.51%	-1.08
SUPP	2013	233	42	-5.30%	-2.16								
	2014	220	42	-6.09%	-2.57								
	2015	103	31	3.00%	0.65								
	2016	95	23	18.56%	1.66								
	2017	85	20	1.57%	0.17								
	2018	83	21	10.03%	1.00								

Model controls for gender/race, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

In the Individual Contributor Career Levels, Total Compensation is Comprised Largely of Base Salary
At Higher Manager Career Levels, Stock Awards Make Up the Bulk of Total Compensation

- 2013-2018, Full Time Full Year Employees, By Career Level -

Career Level	Number of Incumbent Years	Average Base Pay	Average Stock Amount	Average Bonus Amount	Average Total Compensation	% Receiving Stock	% Receiving Bonus	Base Pay as a % of Total Compensation	Stock as a % of Total Compensation	Bonus as a % of Total Compensation
IC0	11	[redacted]								
IC1	79									
IC2	1,166									
IC3	3,655									
IC4	7,146									
IC5	5,174									
IC6	575									
M1	10									
M2	685									
M3	2,275									
M4	2,444									
M5	2,033									
M6	1,151									
M7	134									

Modified Regression Analysis of Total Compensation by Gender or Race Shows No Systematic Pattern of Statistically Significant Results in IC Career Levels Across Years or Job Function

		Female vs. Male				Asian vs. White				African American vs. White			
Job Function	**Year**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
INFTECH	2013	313	92	-4.12%	-2.13								
	2014	316	93	-3.98%	-1.76								
	2015	384	106	-6.53%	-2.99								
	2016	422	114	-4.67%	-2.14								
	2017	368	103	-6.05%	-2.39								
	2018	342	93	-6.01%	-2.42								
PRODEV	2013	2,598	828	-0.97%	-1.15	2,512	1,847	-1.35%	-1.42	686	21	5.20%	0.98
	2014	2,587	818	-0.27%	-0.29	2,502	1,879	-2.31%	-2.16	646	23	-0.89%	-0.14
	2015	2,544	794	-0.70%	-0.71	2,456	1,868	-2.03%	-1.82	609	21	0.81%	0.12
	2016	2,548	772	-1.33%	-1.38	2,440	1,881	-0.77%	-0.68	584	25	-2.21%	-0.37
	2017	2,545	765	-1.26%	-1.21	2,439	1,894	-0.92%	-0.76	568	23	-4.18%	-0.68
	2018	2,359	727	-0.86%	-0.80	2,250	1,749	-2.25%	-1.78	524	23	-8.06%	-1.23
SUPP	2013	186	38	-4.60%	-1.84								
	2014	173	37	-3.29%	-1.47								
	2015	82	26	6.70%	1.28								
	2016	72	18	2.24%	0.22								
	2017	66	15	-17.75%	-3.20								
	2018	64	16	-6.88%	-0.84								

Model controls for gender/race, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

Modified Regression Analysis of Total Compensation by Gender or Race Shows No Systematic Pattern of Statistically Significant Results in M Career Levels Across Years or Job Function

* Results suppressed if fewer than 5 employees in the protected class.

		Female vs. Male				Asian vs. White				African American vs. White			
Job Function	**Year**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
INFTECH	2013	127	32	-4.82%	-0.93								
	2014	131	31	0.17%	0.03								
	2015	172	30	6.66%	1.08								
	2016	182	29	6.81%	1.16								
	2017	176	29	3.83%	0.65								
	2018	179	34	-1.92%	-0.32								
PRODEV	2013	1,303	295	-2.48%	-1.14	1,271	899	0.73%	0.37	376	4		
	2014	1,285	292	-1.40%	-0.54	1,254	885	1.95%	0.83	372	3		
	2015	1,270	287	-2.37%	-0.91	1,231	882	2.74%	1.13	353	4		
	2016	1,261	283	-0.38%	-0.16	1,219	897	0.17%	0.07	326	4		
	2017	1,271	287	0.73%	0.28	1,230	926	-1.59%	-0.63	308	4		
	2018	1,226	272	-0.04%	-0.01	1,185	913	-3.27%	-1.25	276	4		
SUPP	2013	47	4										
	2014	47	5	-40.62%	-9.12								
	2015	21	5	-72.60%	0.00								
	2016	23	5	38.41%	0.00								
	2017	19	5	-10.07%	0.00								
	2018	19	5	-25.40%	0.00								

Model controls for gender/race, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

Modified Regression Analysis of Total Compensation by Gender or Race Shows No Systematic Patterns of Statistically Significant Results in Any Career Level in PRODEV, 2014

- The Only Significant Result Shows Women with Higher Compensation (IC6) -

		Female vs. Male				Asian vs. White				African American vs. White			
Job Function	Global Career Level	# Obs. Used	# Protected Group	Pay Diff. (%)	T-Value	# Obs. Used	# Protected Group	Pay Diff. (%)	T-Value	# Obs. Used	# Protected Group	Pay Diff. (%)	T-Value
PRODEV	IC1	7	4			7	5	2237.8%	0.00	2	0		
PRODEV	IC2	203	67	2.0%	0.95	195	176	-0.5%	-0.13	20	1		
PRODEV	IC3	548	218	-0.7%	-0.53	533	451	0.7%	0.36	90	8		
PRODEV	IC4	989	336	-0.5%	-0.33	956	737	-3.4%	-1.91	226	7	-6.5%	-0.65
PRODEV	IC5	753	187	2.4%	0.91	725	480	-2.3%	-1.01	252	7	-12.6%	-0.95
PRODEV	IC6	87	6	109.4%	2.80	86	30	-1.5%	-0.10	56	0		
PRODEV	M2	105	33	3.8%	0.43	102	89	-4.5%	-0.31	13	0		
PRODEV	M3	370	104	0.5%	0.15	361	299	-1.6%	-0.40	63	1		
PRODEV	M4	347	85	-0.3%	-0.07	340	238	4.9%	1.34	104	2		
PRODEV	M5	283	44	-1.4%	-0.16	281	178	2.8%	0.43	103	0		
PRODEV	M6	161	24	-3.5%	-0.14	152	75	-21.1%	-1.05	77	0		
PRODEV	M7	19	2			18	6	-98.4%	0.00	12	0		

Model controls for gender/race, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

Modified Regression Analysis of Total Compensation for Asians vs. Whites in PRODEV Shows No Statistically Significant Effect of H1B Status

Year	Coefficient	T-Value
2013	0.0181	1.53
2014	0.0207	1.53
2015	0.0045	0.34
2016	0.0075	0.59

Note: The coefficient is never statistically significant. Model controls for Asian, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, whether they arrived at Oracle as an experienced hire or through an acquisition, and whether on H1B visa.

There are Differences in The Job Level Applied for by Men and Women

- 2013-2018 Experienced Hires -

Career level applied to		Females		Males	
		Count	Percent	Count	Percent
Individual Contributers (Chi-sq test p-value: <.0001)	IC1	3	1.0%	8	0.8%
	IC2	22	7.1%	42	4.1%
	IC3	109	35.0%	240	23.7%
	IC4	128	41.2%	455	44.9%
	IC5	46	14.8%	232	22.9%
	IC6	3	1.0%	36	3.6%
	Total	**311**	**100.0%**	**1013**	**100.0%**
Managers (Fisher's exact test p-value: 0.3567)	M2	3	6%	19	7%
	M3	14	27%	56	20%
	M4	21	41%	96	34%
	M5	9	18%	73	26%
	M6	4	8%	40	14%
	Total	**51**	**100%**	**284**	**100%**

There are Differences in The Job Level Applied for by Asians and Whites

- 2013-2018 Experienced Hires -

Career level applied to		Asians		Whites	
		Count	Percent	Count	Percent
Individual Contributers (Chi-sq test p-value: <.0001)	IC1	3	0.3%	3	1.1%
	IC2	49	5.1%	5	1.9%
	IC3	276	28.8%	52	19.8%
	IC4	430	44.9%	111	42.2%
	IC5	177	18.5%	79	30.0%
	IC6	23	2.4%	13	4.9%
	Total	**958**	**100.0%**	**263**	**100.0%**
Managers (Fisher's exact test p-value: 0.0060)	M2	19	8.3%	2	2.9%
	M3	57	25.0%	7	10.3%
	M4	77	33.8%	25	36.8%
	M5	53	23.2%	19	27.9%
	M6	22	9.6%	15	22.1%
	Total	**228**	**100.0%**	**68**	**100.0%**

Comparison of Actual vs. Applied for Job Level for Women vs. Men

- 2013-2018 Experienced Hires into IC Career Levels -

Actual Placement v. Application	# Females	% Females	# Males	% Males
Higher	37	11.9%	157	15.5%
Same	225	72.3%	669	66.0%
Lower	49	15.8%	187	18.5%
Total	**311**	**100.0%**	**1013**	**100.0%**

Chi-sq test p-value: 0.1063

Comparison of Actual vs. Applied for Job Level for Women vs. Men

- 2013-2018 Experienced Hires in M Career Levels -

Actual Placement v. Application	# Females	% Females	# Males	% Males
Higher	9	17.6%	40	14.1%
Same	37	72.5%	230	81.0%
Lower	5	9.8%	14	4.9%
Total	**51**	**100.0%**	**284**	**100.0%**

Fisher's exact test p-value: 0.2763

Comparison of Actual vs. Applied for Job Level for Asians vs. Whites

- 2013-2018 Experienced Hires into IC Career Levels -

Actual Placement v. Application	# Asian	% Asian	# White	% White
Higher	142	14.8%	41	15.6%
Same	625	65.2%	191	72.6%
Lower	191	19.9%	31	11.8%
Total	**958**	**100.0%**	**263**	**100.0%**

Chi-sq test p-value: 0.0095

Comparison of Actual vs. Applied for Job Level for Asians vs. Whites

- 2013-2018 Experienced Hires into M Career Levels -

Actual Placement v. Application	# Asian	% Asian	# White	% White
Higher	32	14.0%	7	10.3%
Same	185	81.1%	56	82.4%
Lower	11	4.8%	5	7.4%
Total	**228**	**100.0%**	**68**	**100.0%**

Fisher's exact test p-value: 0.5529

Comparison of Actual vs. Applied for Job Level for African Americans vs. Whites

- 2013-2018 Experienced Hires into IC Career Levels -

Actual Placement v. Application	# African American	% African American	# White	% White
Higher	1	14.3%	41	15.6%
Same	5	71.4%	191	72.6%
Lower	1	14.3%	31	11.8%
Total	**7**	**100.0%**	**263**	**100.0%**

Fisher's exact test p-value = 0.9779

- Based on OFCCP Data and OFCCP Regression Model -
The OFCCP's Regression Analysis of Total Compensation Shows No Statistically Significant Results for Asians vs. Whites
- INFTECH and SUPP Job Functions -

		Asian vs. White			
Job Function	**Year**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
INFTECH	2013	407	281	-1.13%	-0.37
	2014	411	285	-1.92%	-0.55
	2015	520	394	-0.60%	-0.20
	2016	560	427	2.49%	0.89
SUPP	2013	223	179	6.04%	1.15
	2014	212	176	4.22%	0.78
	2015	95	68	11.24%	1.54
	2016	88	63	14.15%	1.73

Model controls for Asian, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

- Based on OFCCP Data and OFCCP Regression Model - The OFCCP's Model Predicts Higher Pay for Asians vs. Whites for Most Tenure Groups

- Base Pay by Tenure Group -
- INFTECH and SUPP Job Functions -

Job Function	Experience	# Obs. Used	# Protected Group	Pay Diff. (%)	T-Value
INFTECH	1 to <3	257	197	-7.31%	-1.89
	3 to <5	256	195	4.51%	1.14
	5 to <7	177	134	4.31%	0.92
	7 to <9	208	157	7.90%	1.97
SUPP	1 to <3	103	92	12.39%	2.02
	3 to <5	98	78	9.62%	1.80
	5 to <7	76	60	-8.96%	-1.17
	7 to <9	95	70	0.28%	0.05

Model controls for Asian, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

- Based on OFCCP Data and OFCCP Regression Model - The Pay Gap Does Not Increase With Tenure in INFTECH and is Not Statistically Significant for the Youngest Tenure Group in SUPP for Females vs. Males

- Base Pay by Tenure Group -

- INFTECH and SUPP Job Functions -

Job Function	Experience	# Obs. Used	# Protected Group	Pay Diff. (%)	T-Value
INFTECH	1 to <3	289	56	-10.19%	-2.99
	3 to <5	283	63	-5.05%	-1.38
	5 to <7	201	47	-5.32%	-1.25
	7 to <9	220	75	1.42%	0.44
SUPP	1 to <3	106	14	-5.76%	-1.24
	3 to <5	110	19	-9.65%	-2.15
	5 to <7	83	24	-11.65%	-2.13
	7 to <9	96	21	-12.14%	-2.50

Model controls for female, standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Modified Regression Analysis of Total Compensation Shows No Statistically Significant Results for Asian Males vs. White Males in Any Year Within PRODEV

		Asian Males vs. White Males			
Job Function	**Year**	**# Obs. Used**	**# Protected Group**	**Pay Diff. (%)**	**T-Value**
PRODEV	2013	2,688	1,884	-0.27%	-0.25
	2014	2,673	1,905	-0.35%	-0.28
	2015	2,633	1,901	-0.26%	-0.20
	2016	2,632	1,945	-0.21%	-0.17

Model controls for Asian male, standard job title, part-time/full-time, time in company (Oracle America), total Oracle tenure (including time at acquisition and non-USA affiliate), previous experience (age minus total Oracle tenure minus 22), cumulative time spent on leave of absence, whether leave of absence was in current year, time in job, organization, whether the employee ever has a patent bonus, and whether they arrived at Oracle as an experienced hire or through an acquisition.

Attachment D: Supervisor Pie Charts

Supervisors Two Levels Above Employee: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions -

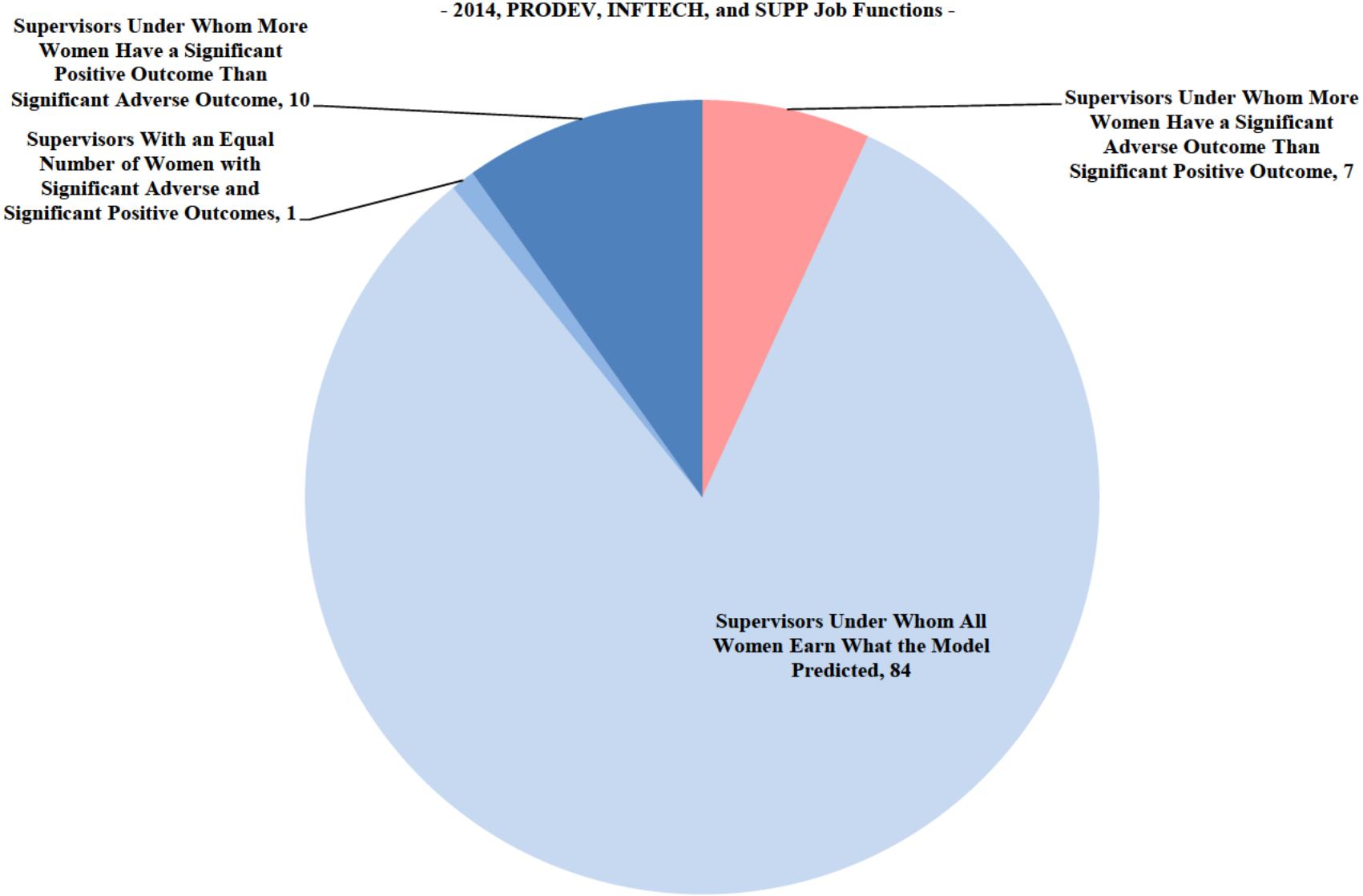

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 42.0% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees by Supervisors Two Levels Above: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

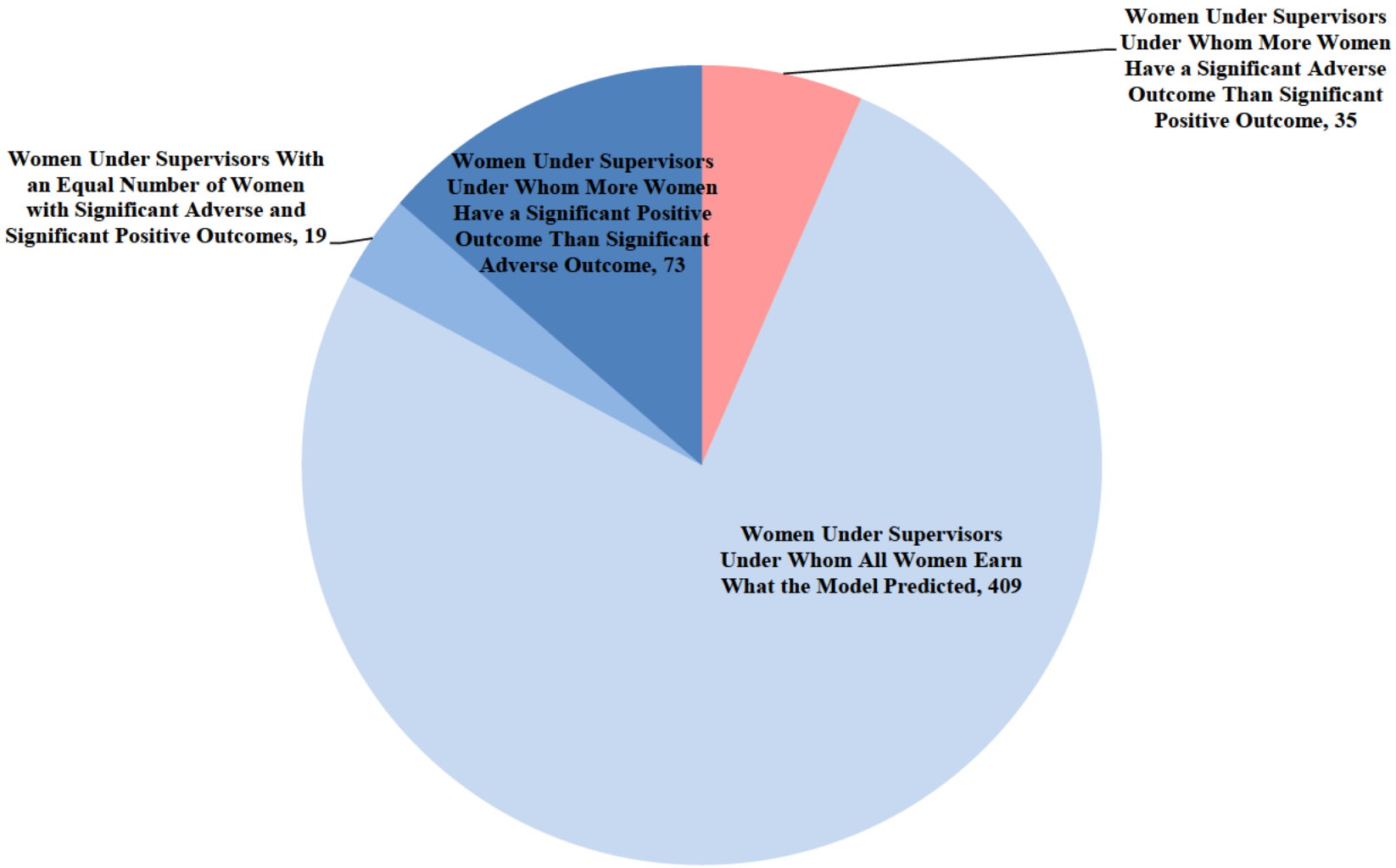

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 42.0% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Three Levels Above Employee: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -

- 2014, PRODEV, INFTECH, and SUPP Job Functions-

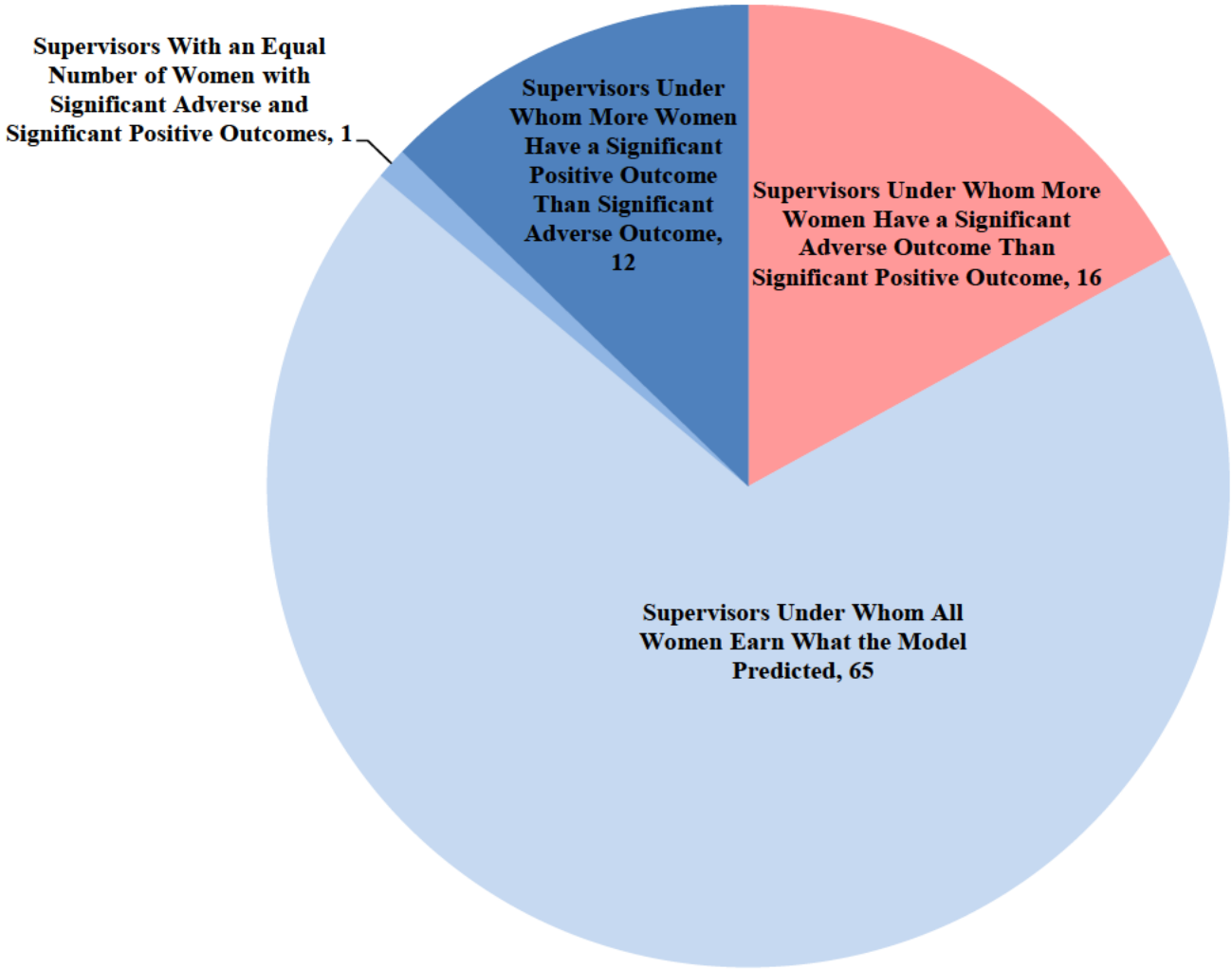

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 76.3% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees by Supervisors Three Levels Above: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

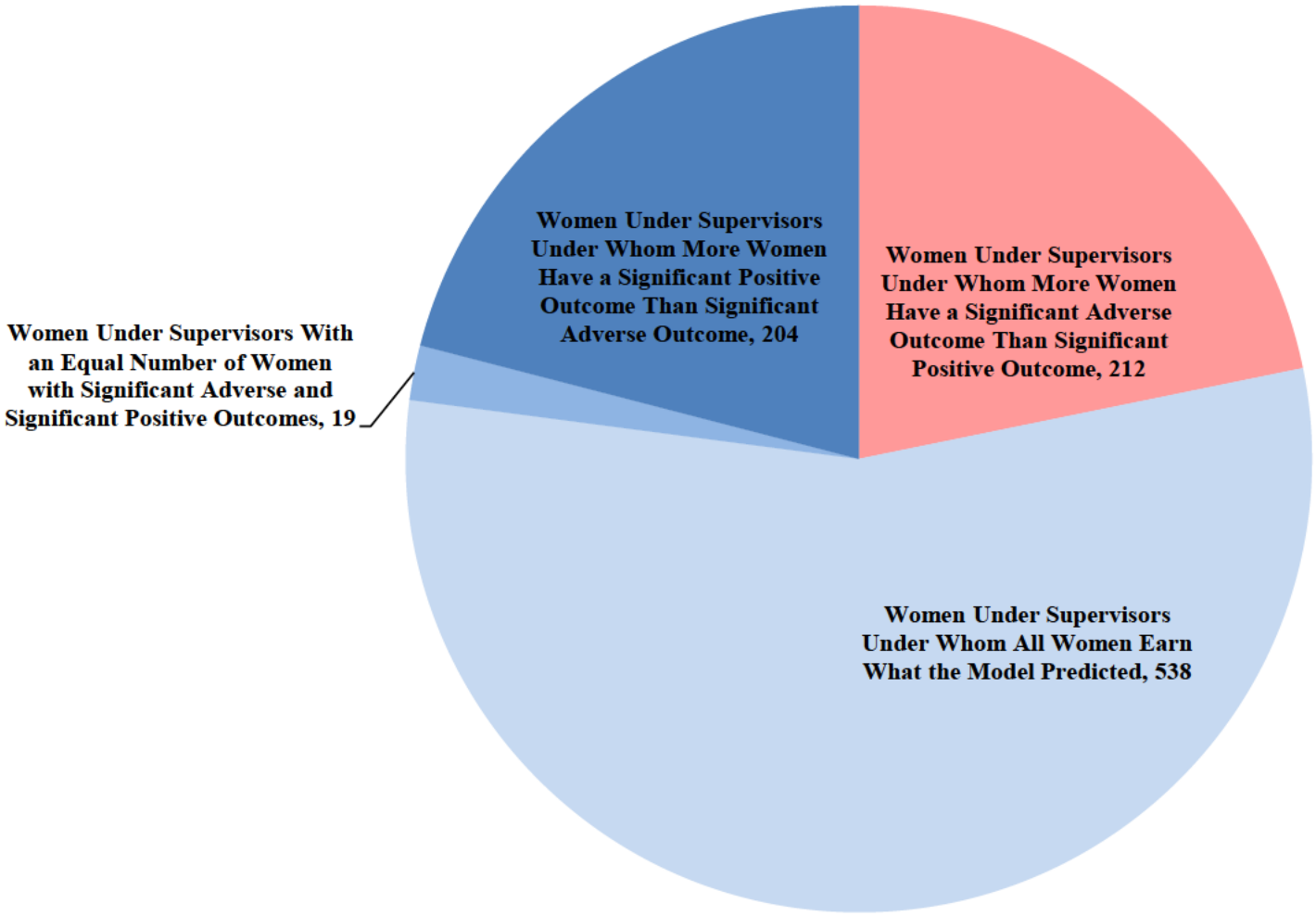

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 76.3% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Four Levels Above Employee: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

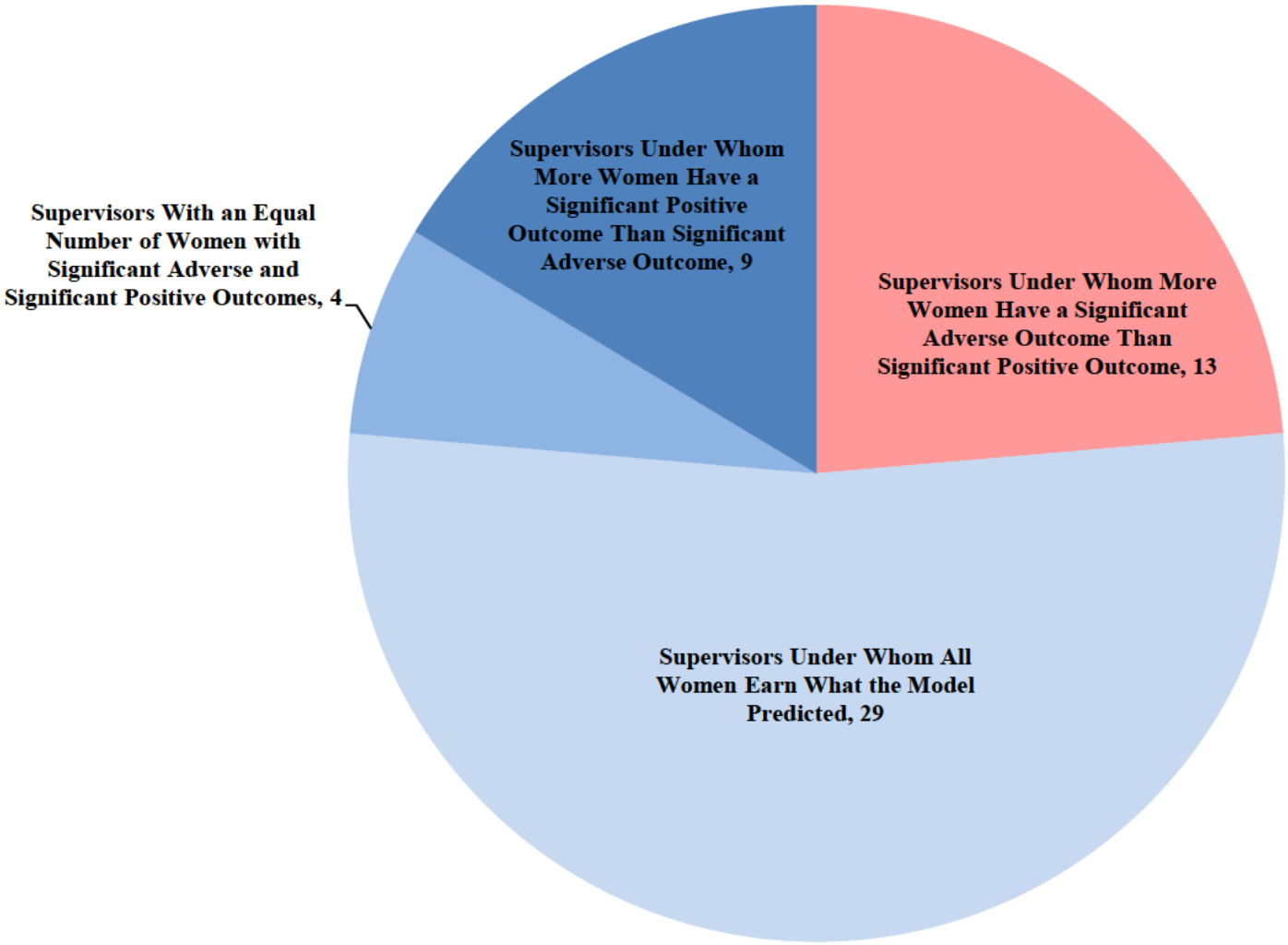

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 89.3% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees by Supervisor Four Levels Above: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

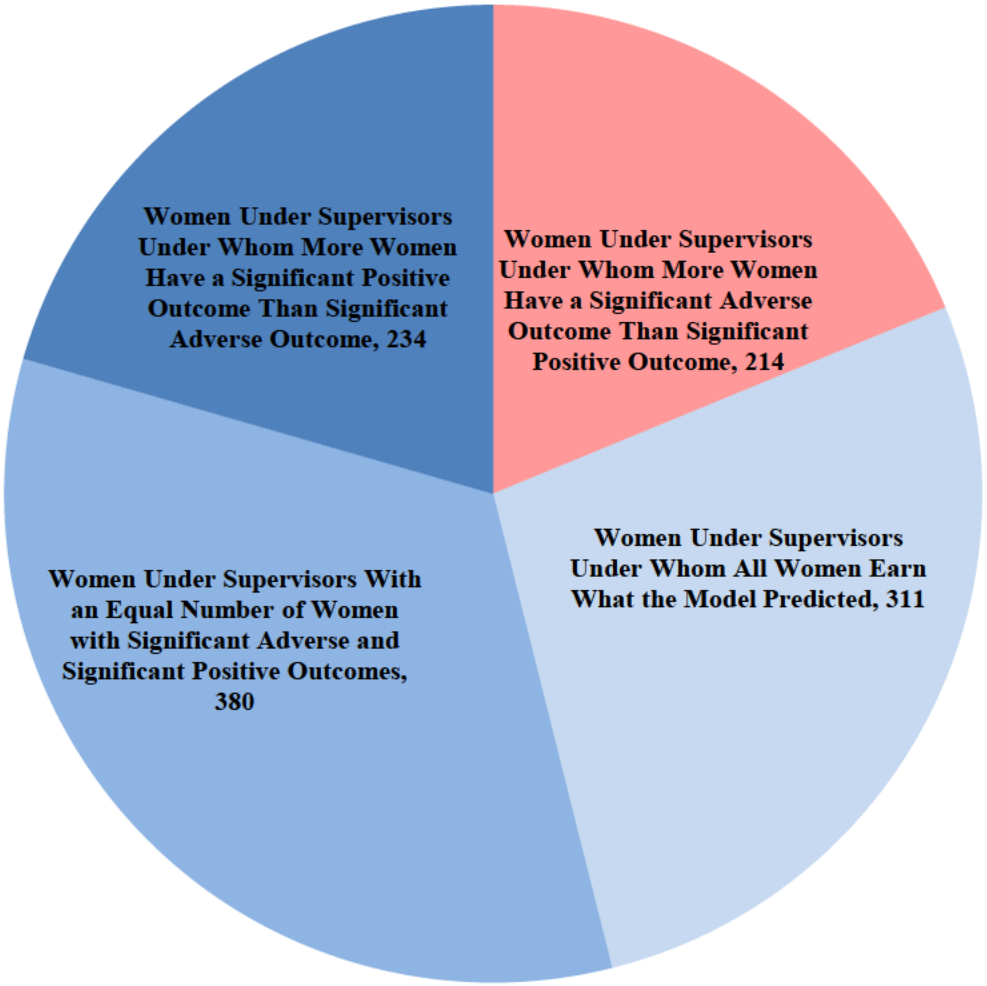

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 89.3% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Five Levels Above Employee: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

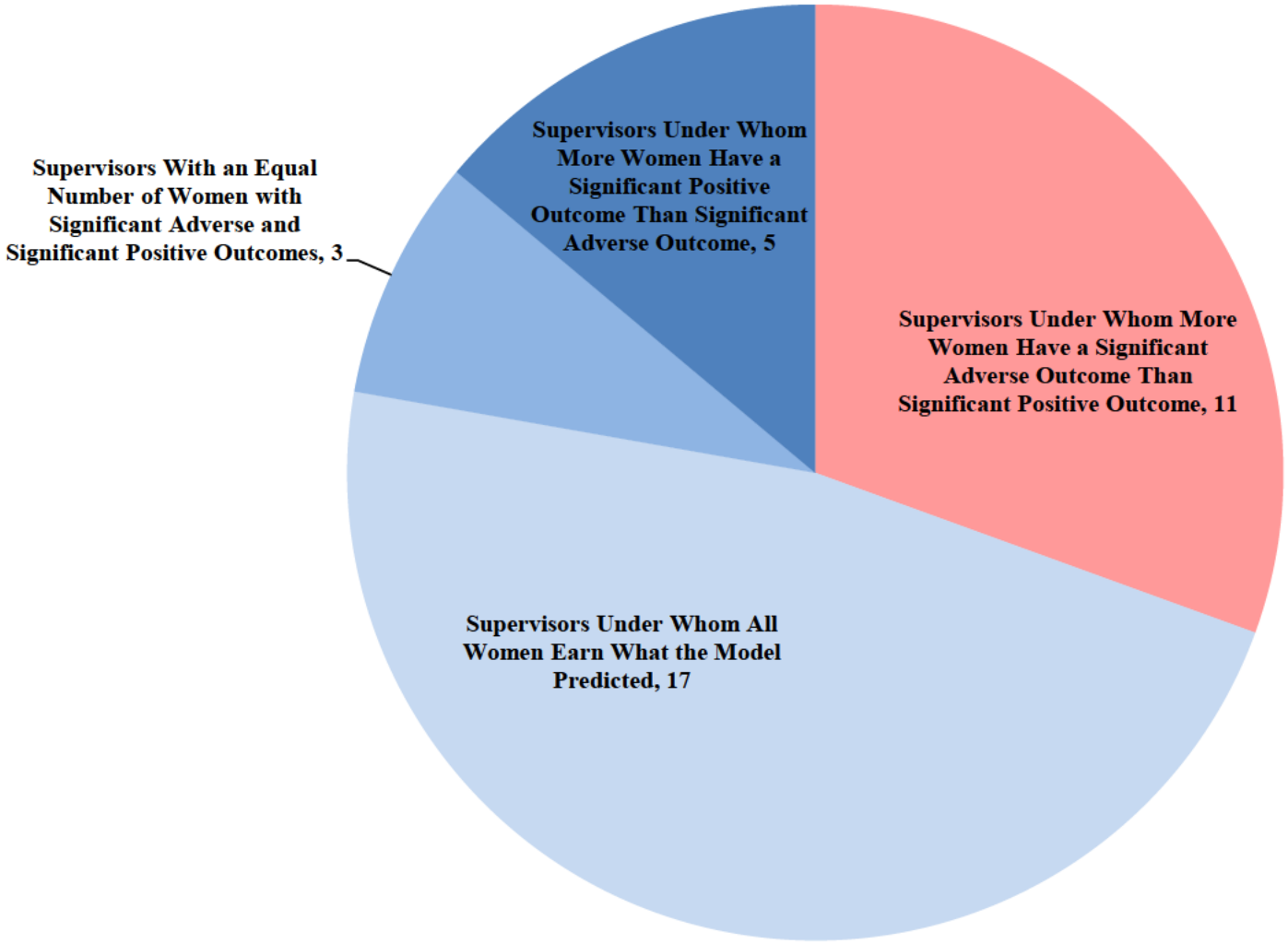

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 96.6% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees by Supervisors Five Levels Above: Total Compensation (Medicare Wages) for Women

- Prediction Based on OFCCP Model, Without a Gender Control -
- 2014, PRODEV, INFTECH, and SUPP Job Functions-

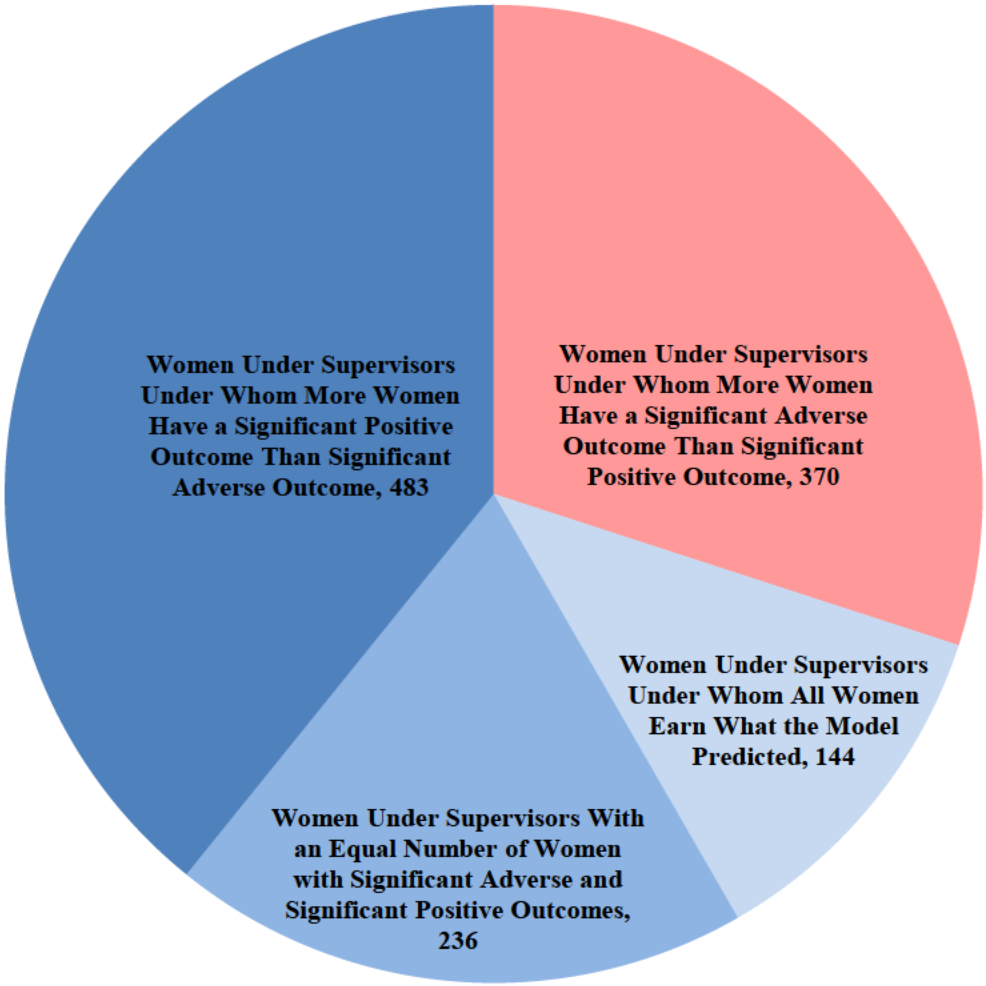

Chart is limited to supervisors with at least 10 employees and 2 women, accounting for 96.6% of women employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Two Levels Above Employee: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

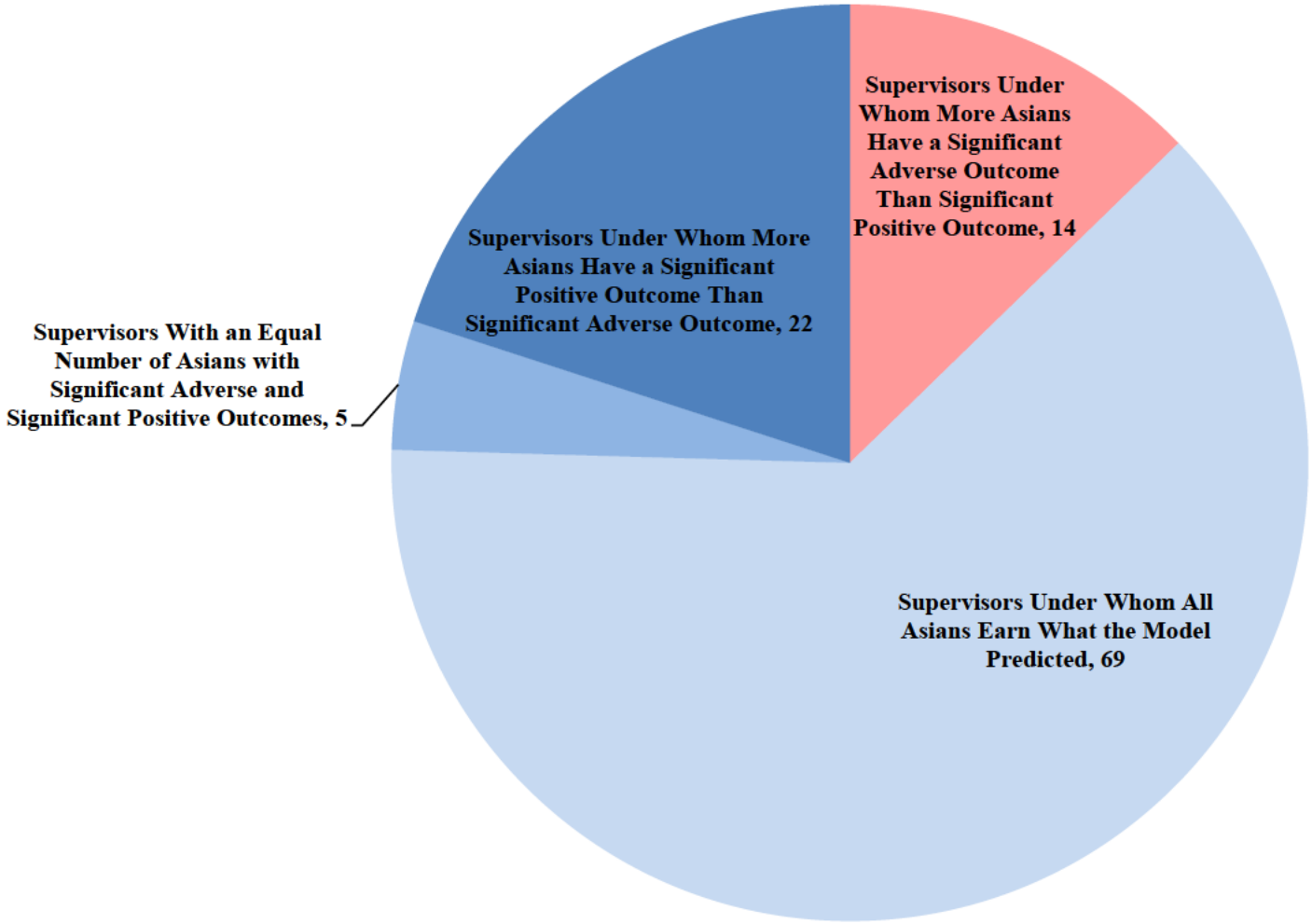

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 52.2% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees Under Supervisors Two Levels Above: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

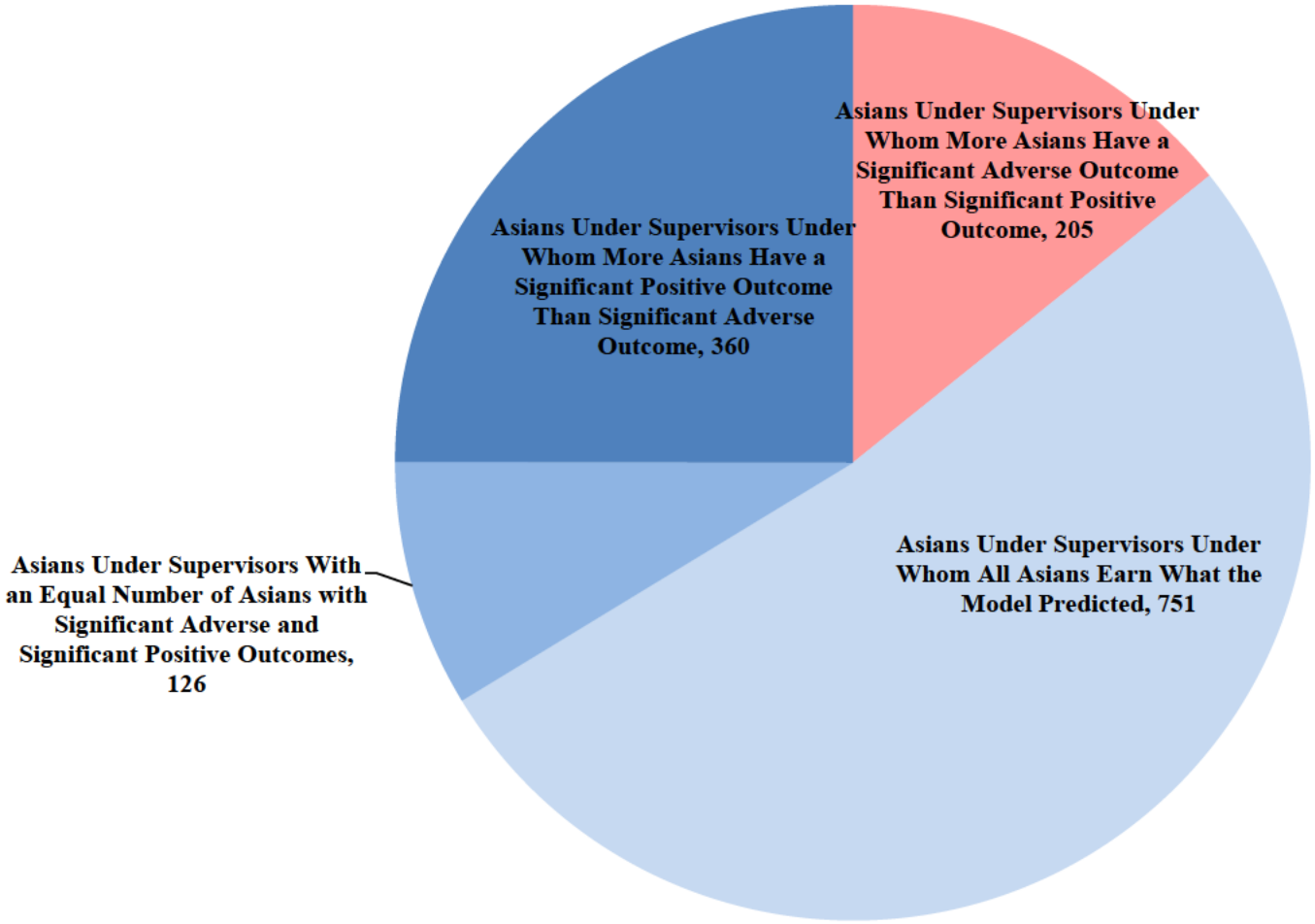

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 52.2% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Three Levels Above Employee: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

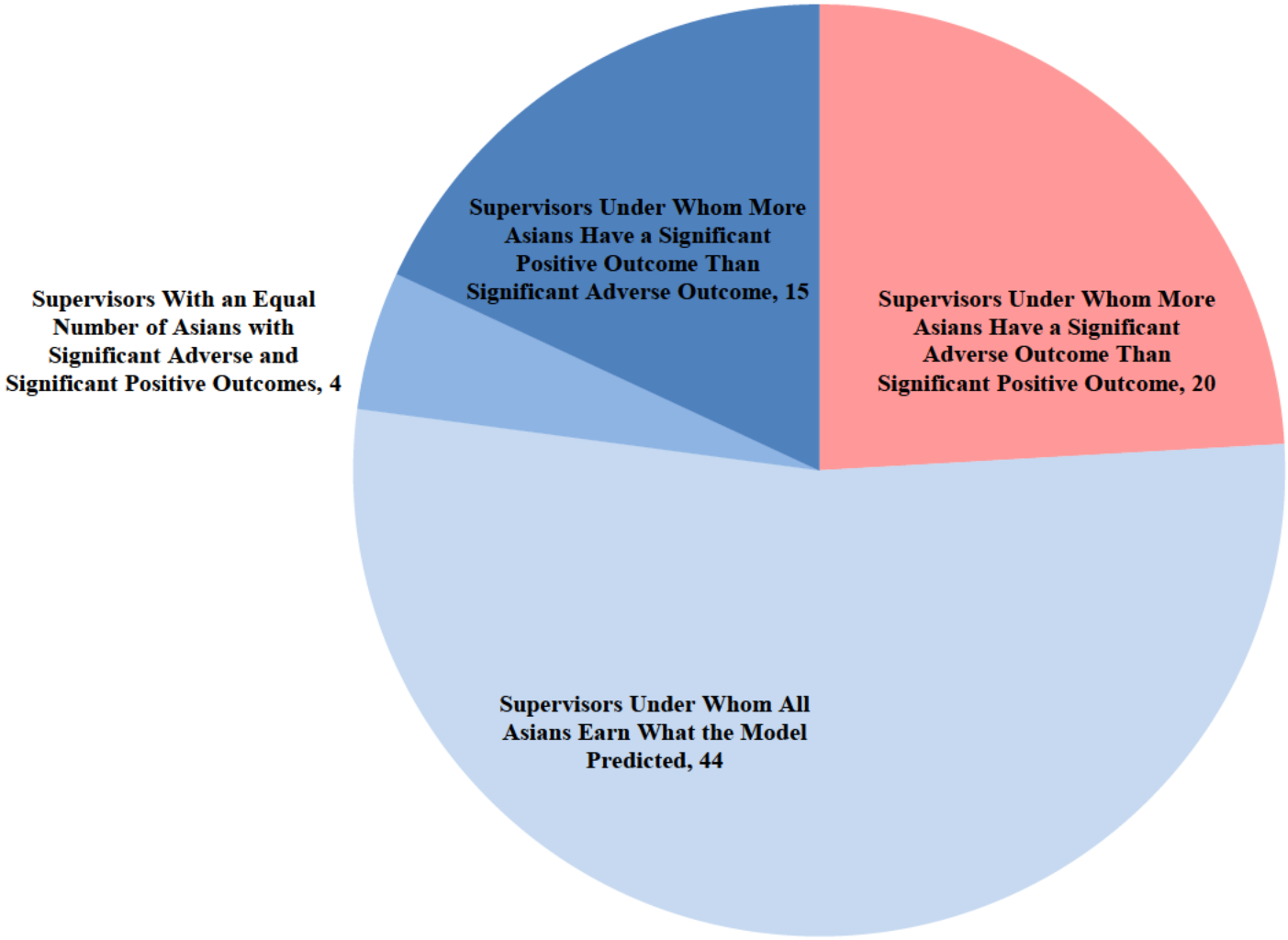

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 81.4% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees Under Supervisors Three Levels Above: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

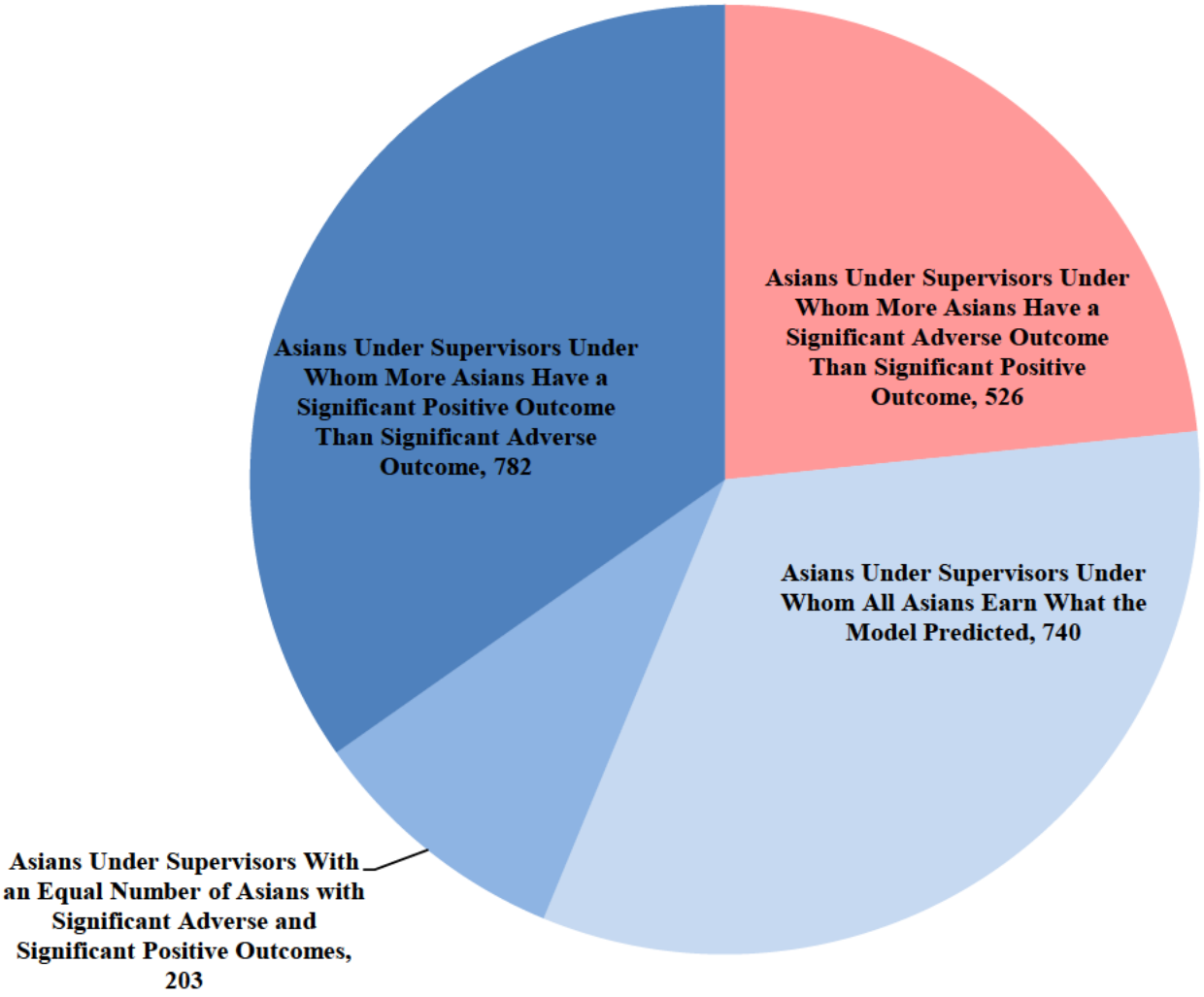

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 81.4% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Four Levels Above Employee: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

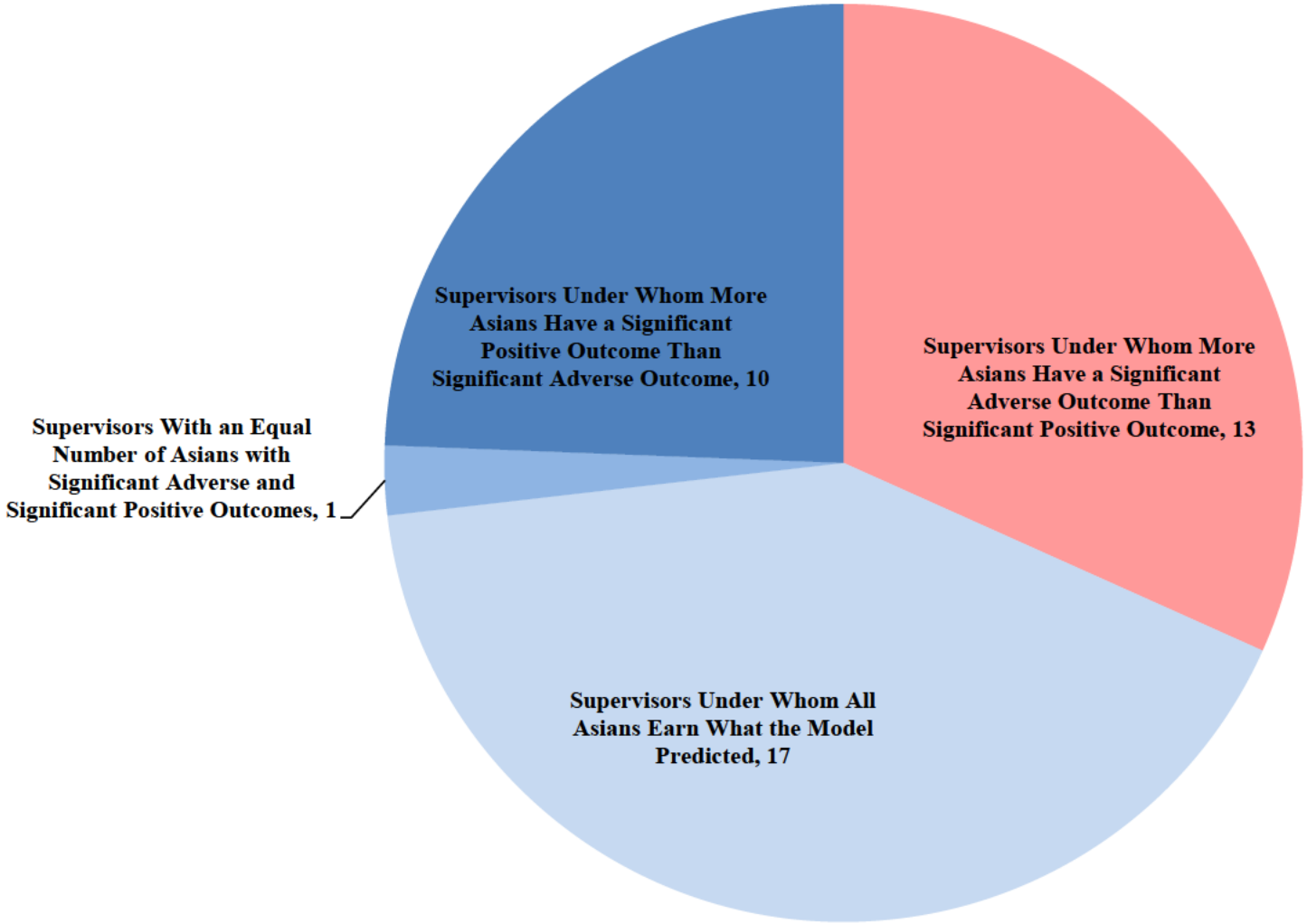

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 92.9% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees Under Supervisors Four Levels Above: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

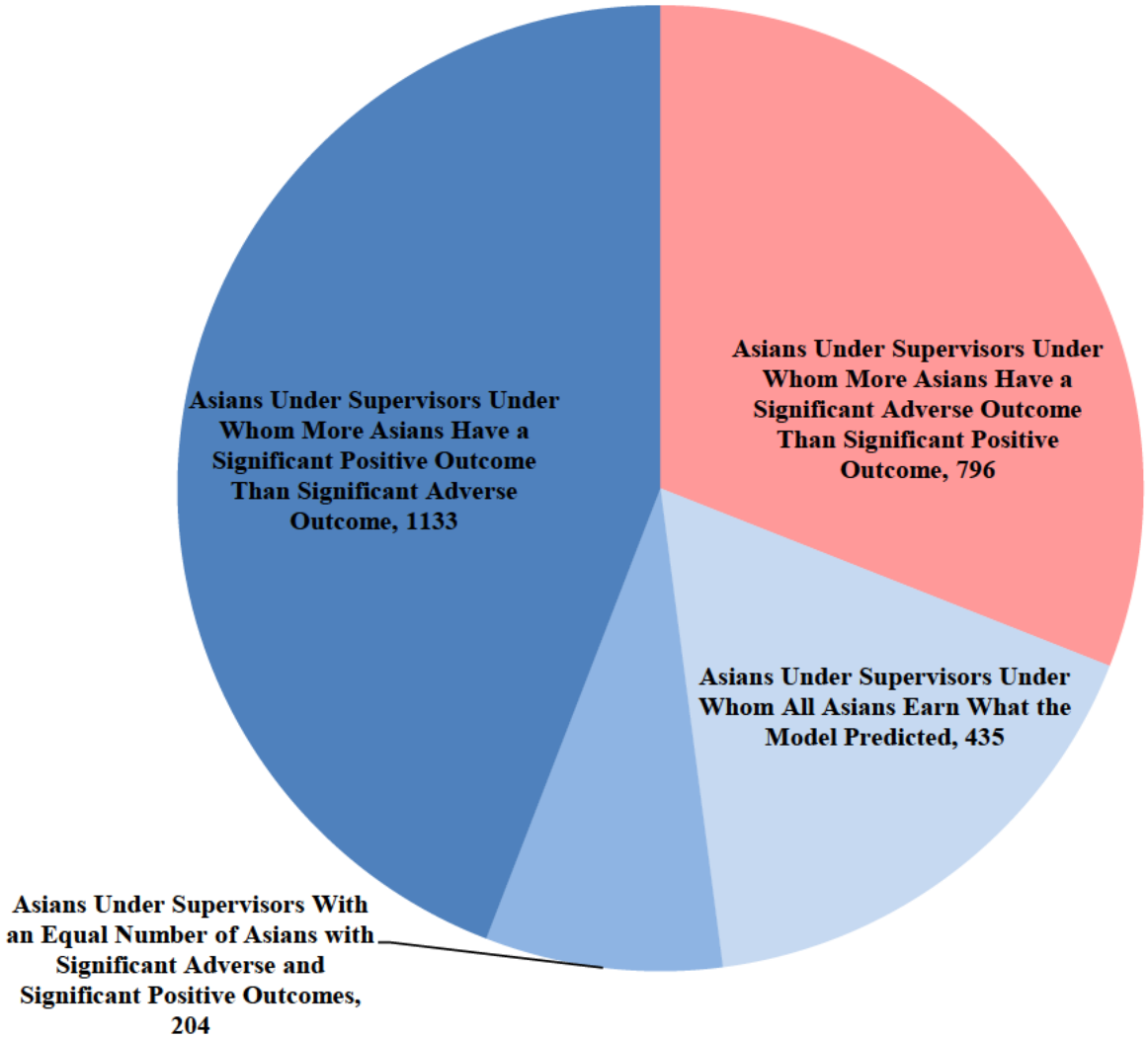

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 92.9% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Employees Under Supervisors Five Levels Above: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

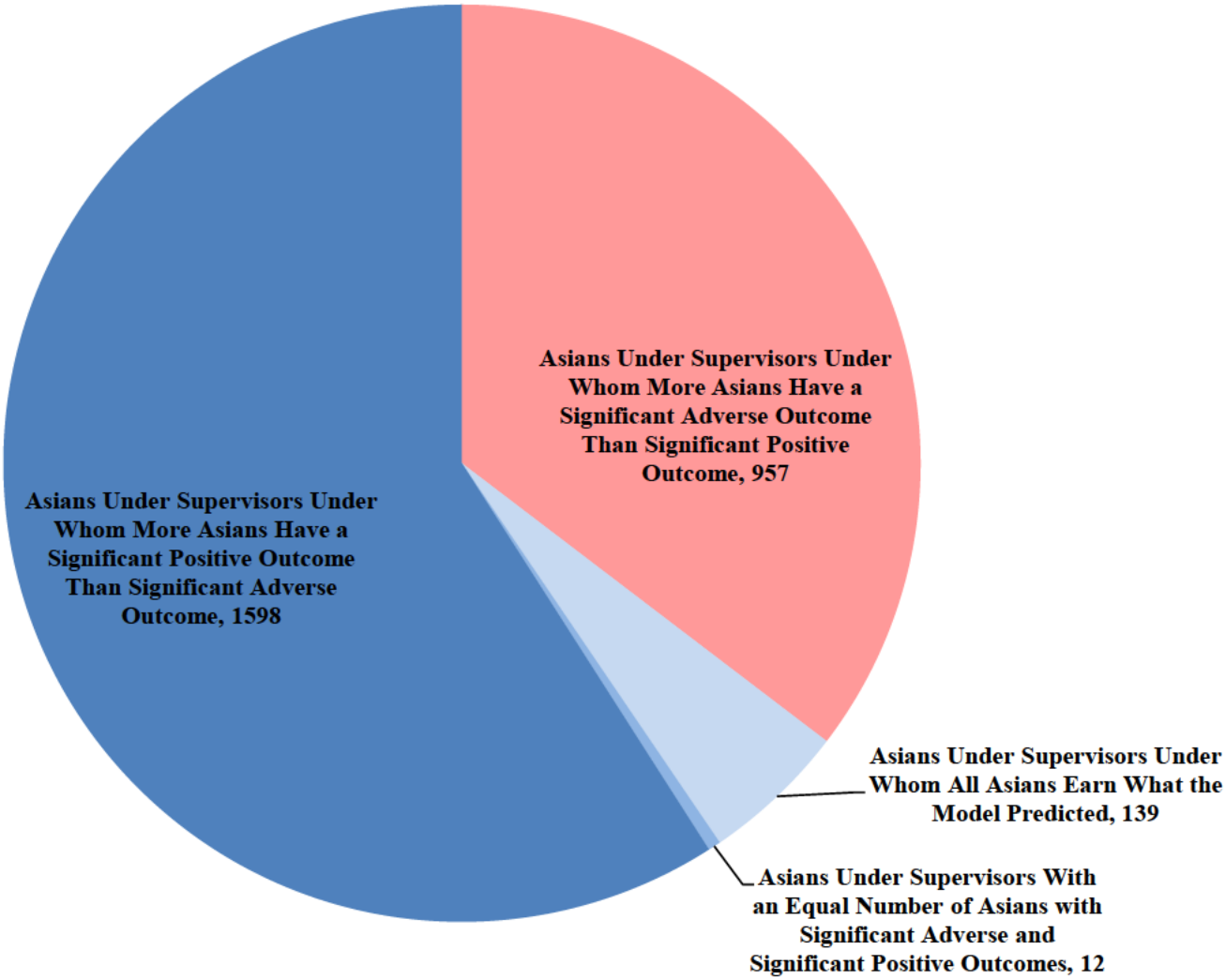

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 97.9% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Supervisors Five Levels Above Employee: Total Compensation (Medicare Wages) for Asians

- Prediction Based on OFCCP Model, Without a Race Control -

- PRODEV Job Function, 2014 -

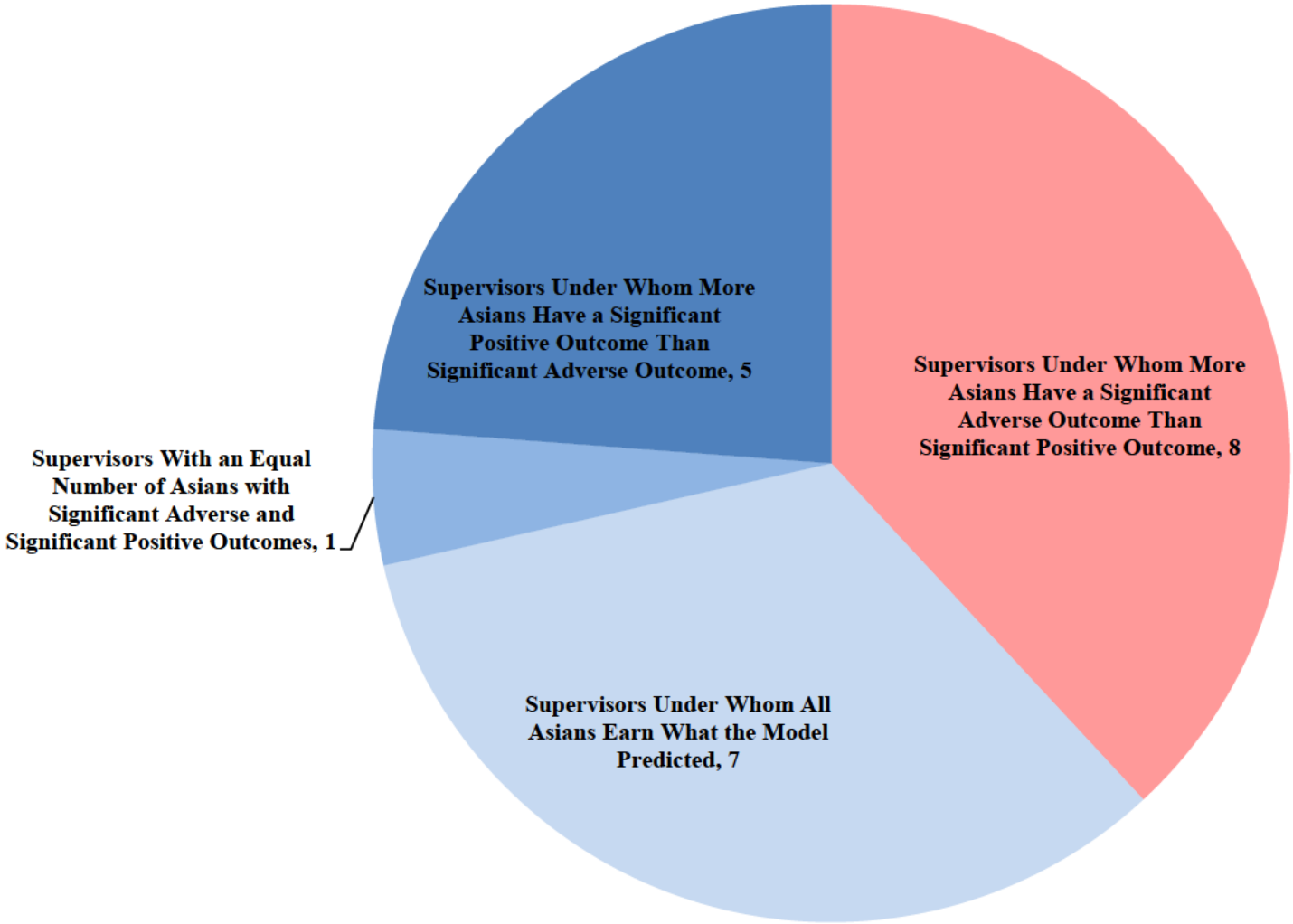

Chart is limited to supervisors with at least 10 employees and 2 Asians, accounting for 97.9% of Asian employees.
Model controls for standard job title, part-time/full-time, time in company, and previous experience (age minus time in company minus 18).

Attachment E: Clusters

Within job titles, skills and responsibilities vary widely

1. The OFCCP regression models control for "global career level, job specialty, and standard job title."[1] Although job titles can be used to segment the data to a certain extent, it appears that employees performing dissimilar work continue to be grouped together using this approach. Organization, or cost center, was used in my models to group employees by products and services they work on but it is not entirely well suited to group employees doing similar work, due to its dual business and accounting function.[2] In order to test whether job content varies within a job title, new hire requisitions were analyzed to determine whether there are other ways to think about the differences in job requirements even holding job title constant.[3]

2. Several studies have used clustering algorithms to extract skill requirements from the text of job requisitions, with a particular emphasis on identifying the specific skills required for different types of IT jobs. Much of this research stems from a need to identify high demand skills in the face of rapid change in the types of skills required by IT jobs.

3. Woweczko (2015) analyzed online job advertisements in Ireland to extract information on skills needs from job descriptions, and presents word clouds[4] showing the top bigrams[5] for

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[1] Second Amended Complaint, paragraph 13, p. 6.

[2] "At the most granular level of the financial and accounting hierarchy, "cost center" (sometimes called "organizations") are used for purposes of tracking budget and other financial outcomes. A cost center can encompass a single product or service team, but not every product or service team has its own cost center." Miranda Declaration, paragraph 8.

[3] The requisition data contains information relating to job listings and included generic company information, as well as detailed text that described the specific job requirements. The generic text was not analyzed. Rather, the job specific detailed text was analyzed for this analysis.

[4] "Word cloud" is a term of art used to visually depict the importance of each word, where importance is measured using word frequency within and across documents calculated by the clustering technique. Less frequent words may appear larger if the algorithm determines they are more important.

[5] A bigram is a pair of consecutive written elements, in this case two consecutive words in a field of text.

seven different IT occupations. Woweczko concludes that the skills extracted using this method are more detailed than what would be found in standard occupational descriptions.[6]

4. Litecky, et al. (2010) examined online listings for software engineers on Monster.com, HotJobs.com and SimplyHired.com, finding that "even a brief examination of these tools shows that US job titles vary substantially and that job definitions are often misleading."[7] Their study used cluster analysis of job skill terms found in the listing text and identified 20 IT job categories and associated skill sets. They found that among the advertisements analyzed there were five clusters for software developers: "The software developers group consists of five clusters of traditional non-Web-based development, with moderate demands for programming in general, software development, and object-oriented programming skills, plus specific language skills such as C/C++, Java, or C#. For example, two clusters focus on C/C++ and generic programming skills. The two clusters are distinguished through the supplementary skills required for those jobs. C/C++ programmer jobs focus primarily on programming-language skills, whereas the system-level C/C++ programmer jobs also require skills in general programming, software development, operating systems, security, and Perl. This indicates that the latter cluster undertakes work at the operating systems level as well as supporting traditional Perl-based work."[8] In this case, the word cloud analysis revealed differences in skill requirements for different segments of the software developer job spectrum.

5. Creating economic variables from text based sources is not new. Economists have a long history of utilizing coded text data in their analyses. One familiar example is the data on

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[6] Woweczko, Izabella A. (2015) Skills and Vacancy Analysis with Data Mining Techniques, *Informatics*, 2, pp. 31-49.
[7] Litecky, Chuck, et al. (January/February 2010), Mining for Computing Jobs, *IEEE Software*.
[8] Ibid, p. 80.

workers' occupations and industries collected by the US Census Bureau.[9] The census questionnaire asks respondents "What kind of work was this person doing?" and "What were this person's most important activities and duties?" with a "fill-in-the-blank field" that allows a free-form response. There is no drop down menu option for respondents to choose from. Rather than let respondents decide what their occupational category is, the Census Bureau applies their expertise in the nature of work and what occupation it constitutes to convert free form text descriptions of what people say they do at work to a census OCC code. In the case of the Census, the written responses are then reviewed and coded into standardized occupation classifications, which can then be included as categorical or stratifying variables in quantitative analyses. Similarly, the questionnaire asks about the industry in which one works using both free-form and check-box questions which are then clerically coded by Census Bureau staff.[10] The resulting coded occupations and industries can then be utilized by economists and other researchers in their analyses.

6. I have in my previous work performed conversion of detailed textual descriptive material into job categories. For example, in a hiring case I and my team processed 30,000 handwritten employment applications and created a set of job categories. These categories were then used in statistical analysis of hiring. In another case, I and my team processed tens of thousands of promotion job postings, and converted qualitative material into data that would be subjected to statistical analysis. In short, processing of text and other qualitative material into quantitative or categorical formats is nothing new.

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[9] United States Census Bureau: Industry and Occupation (https://www.census.gov/topics/employment/industry-occupation/about/occupation.html).
[10] Ibid.

7. Economists and other professionals have increasingly incorporated in their research analysis of text-based data sets to extract and classify textual information.[11] Some of these studies have focused on using textual analysis to examine media sentiment,[12] policy uncertainty,[13] and the health and stability of financial systems.[14] Economists have utilized text data derived from analysis of Google searches,[15] Yelp reviews,[16] and Twitter messages[17] in empirical analyses.

8. Here, I use these techniques to analyze the 521 detailed text job requisitions for the largest job title in the data, Software Developer 4. Following methodology that is typical in the application of text processing, the job posting text was prepared for analysis by removing what are referred to as stop words, as well as punctuation and irregular characters that are not useful

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[11] See, for example: Einav, Liran and Jonathan D. Levin (2014) The Data Revolution and Economic Analysis. *Innovation Policy and the Economy*, 14, pp. 1-24; and Gentzkow, Matthew, Bryan T. Kelly and Matt Taddy. (Forthcoming) Text as Data. *Journal of Economic Literature*.

[12] See, for example: Gentzkow, Matthew, Jesse M. Shapiro and Michael Sinkinson (2014). Competition and Ideological Diversity: Historical Evidence from US Newspapers. *American Economic Review*, 104(10), pp. 3073-3114; Gentzkow, Matthew and Jesse M. Shapiro (2010), What Drives Media Slant? Evidence from U.S. Daily Newspapers. *Econometrica*, 78(1), 35-71; and Groseclose, Tim and Jeffrey Milyo, A Measure of Media Bias. *The Quarterly Journal of Economics*, 120(4), pp. 1191-1237.

[13] See Baker, Scott R., Nicholas Bloom and Steven J. Davis (2016), Measuring Economic Policy Uncertainty. *The Quarterly Journal of Economics*, 131(4), pp. 1593-1636.

[14] See, for example: Romer, Christina D. and David H. Romer (2017) New Evidence on the Aftermath of Financial Crises in Advanced Countries. *American Economic Review*, 107(10), pp. 3072-3118; and Born, Benjamin, Michael Ehrmann and Marcel Fratzscher. (2013) Central Bank Communication on Financial Stability. *The Economic Journal*, 124, pp. 701–734.

[15] See, for example: Chae DH, Clouston S, Hatzenbuehler ML, Kramer MR, Cooper HLF, Wilson SM, et al. (2015) Association between an Internet-Based Measure of Area Racism and Black Mortality. *PLoS ONE* 10(4):e0122963; and Saiz, Albert and Uri Simonsohn (2013) Proxying for Unobserved Variables with Internet Document-Frequency. *Journal of the European Economic Association*, 11(1), pp. 137-165.

[16] Taddy, Matt. (2015) Distributed Multinomial Regression. *The Annals of Applied Statistics*, 9(3), pp. 1394-1414.

[17] Taddy, Matt. (2013) Measuring Political Sentiment on Twitter: Factor Optimal Design for Multinomial Inverse Regression. *Technometrics*, 55(4), Special Issue (November 2013), pp. 415-425.

for analysis.[18] Hierarchical clustering, a type of machine learning algorithm, was applied to the text in the qualifications section of the requisitions data to identify similarities and differences between words used to describe the job requirements of each requisition. The algorithm calculates these similarities and differences found in the text by determining the uniqueness of words using a mathematical equation. No analyst judgement is applied at the requisition level.

9. The measure used here to evaluate the importance of a specific term or word is called "Term Frequency, Inverse Document Frequency" (TF-IDF). The TD-IDF is equal to the term frequency weighted by the fraction of documents the word appears in. Technically, the TF-IDF score of a word equals the frequency of word multiplied by the log of the ratio of the number of documents to the number of documents with that word. The algorithm places a higher value on words that from their frequency appear to delineate required skills within subsets of requisitions – such as "cloud" or "fusion."

10. For example, the word "Oracle" appears in almost all requisitions and thus does not provide any information for distinguishing among requisitions. A word's "importance" is scored by combining the frequency of a word in a document, adjusted by the frequency with which it appears in the other documents. Suppose we have a sample of 100 requisitions. Suppose the requisition we are looking at includes the word "computer" 10 times and the word "manage" twice; assume 97 of the other requisitions for this job code also include the word "computer" and just 9 include the word "manage." We calculate the TF-IDF score of the word "computer" by computing "10 * ln(100/97)" which is equal to 0.274. The TF-IDF score of the word "manage" is calculated as "2 * ln(100/9)" which is equal to 4.816. If a particular term appears in every document then it is not useful for distinguishing between subsets of documents; the TF-IDF score for that word equals zero and it is not given any weight.

[18] Stop words are commonly used words such as "a," "the," "is," etc.

11. Ultimately the algorithm clusters similar requisitions into groups that are most similar based on the importance and frequency of the specific terms contained in the descriptions. The analysis applied to the Software Developer 4 requisitions resulted in the creation of 24 unique clusters. The first indication of differences between the clusters can be seen by examining the average starting salary across clusters in the graph below. If one were to place all fulltime Software Developer 4 requisitions into one group, the overall average starting salary would be roughly [redacted]. However, after clustering the requisitions by the descriptions, it is evident that there are distinct differences in starting pay within the Software Developer 4 requisitions at Oracle Headquarters. As the chart shows, there is a range of average starting salaries between employees in each of the clusters ranging from an average starting salary of [redacted] in Cluster 13 to an average starting salary of [redacted] in Cluster 2.

Cluster ID	Average Starting Salary By Requisition Cluster
1	[redacted]
2	[redacted]
3	[redacted]
4	[redacted]
5	[redacted]
6	[redacted]
7	[redacted]
8	[redacted]
9	[redacted]
10	[redacted]
11	[redacted]
12	[redacted]
13	[redacted]
14	[redacted]
15	[redacted]
16	[redacted]
17	[redacted]
18	[redacted]
19	[redacted]
20	[redacted]
21	[redacted]
22	[redacted]
23	[redacted]
24	[redacted]

13. The differences between the clusters can be seen when the text in the qualifications portion of the requisitions is depicted by importance of words in a cluster in a visual "word cloud."[19] The word clouds for all 24 clusters of requisitions for Software Developer 4s are below but I will discuss two clusters here as examples. Each word cloud below presents the 50 most important words per cluster, with the most important terms being presented in large blue or

[19] For the purpose of presenting terms or words in a word cloud, important terms are identified as those with the highest proportion in a cluster minus their proportion across all clusters.

purple font, and the less important terms being presented in small red font. When visually comparing the word clouds, it is evident that there are distinct differences in the importance of terms that appear in each of the clusters.

Cluster 13

Exhibit 25

14. The word cloud above is based on the 10 requisitions in Cluster 13, which has an average starting salary of [redacted] The terms with the greatest weight that appears in Cluster 13 are "test" and "testing," which suggests that this cluster of requisitions relates to testing applications that are developed by others. Closer manual inspection of the text in the qualifications section of the requisitions supports this finding. As just one example, a portion of the responsibilities section of requisition IRC2797620 in Cluster 13 states,

"As fusion apps system testing team, we are responsible for fusion apps SAAS setups OVM, high availability, enterprise manager, enterprise deployment, and lifecycle testing, which includes

• design, implement, and execute test cases based on design specifications

• develop automation framework in java for web 2.0 applications

• develop programs in java to automate test cases

• execute, debug, and fix automated test suites

• report bugs and track for a resolution

• work with global development teams to build testing solutions and troubleshoot issues in order to deliver product in high quality"

Cluster 2

Exhibit 26

15. The average starting salary of Cluster 2 is higher, at [redacted]. The chart above shows that the incidence of terms for Cluster 2 is different than those that appear in Cluster 13. The

highest weighted term in Cluster 2 is "exadata," with "database" and "storage" also being common terms. The prominent terms that appear in Cluster 2 indicate that this group of requisitions is associated with developing Oracle's Exadata database machine. For example, an excerpt of requisition IRC2189577 in Cluster 2 states,

"As a member of the sustaining engineering database team, specializing in the future technology of engineered system, you will articulate, manage, integrate and test critical security and database fixes for Exadata engineered systems. You will work at the forefront of defining the future direction of releases, by being responsible for articulating all necessary security and other critical fixes from across the Exadata stack which includes Linux, storage, networking and database components, and finally, integrating, testing and filtering out the critical and important content by working in close collaboration with various technical teams across the organization and Linux community."

16. The cluster analysis is consistent with the idea that controlling only for job title and not more detailed aspects of work does not group employees doing substantially similar work. This will bias the OFCCP estimates of gender and race pay disparities if employees are not distributed similarly by demographic group across clusters. For example, if women are distributed across these clusters differently than men are – and women were 20.0% of new hires in Cluster 13 and 7.7% of new hires in Cluster 2 – then not accounting for within-job title differences in skills and responsibilities will lead to omitted variable bias in regression models. Because the OFCCP does not accurately or fully control for the nature of the work employees are doing, their analysis suffers from measurement error.

<u>Word Clouds for All 24 Clusters:</u>

Cluster 1

Cluster 2

sustaining
distributed
utilities
hardware
appliance
tuning
fixes
features
future
scripting
environment
engineered
smart
shell
paced
asset
fast
work
systems
linux
high
solaris
platform
exadata
database
virtualization
upgrades
storage
perl
networking
deployment
software
critical
job
years
oracle
machine
aspects
technology
flash
history
scripts
life
industry
workloads
multiple
end
cycle
maintenance
offerings

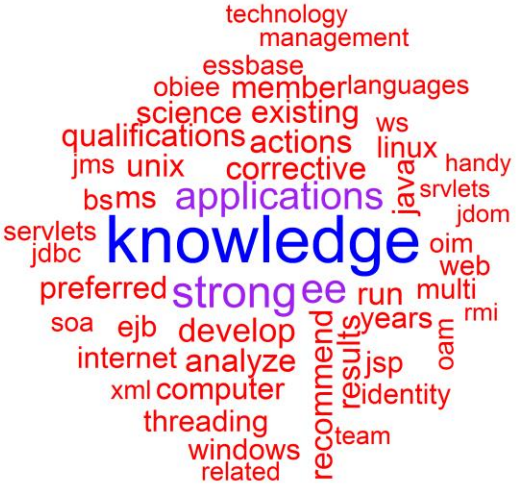
Cluster 3

willingness
configuration
vm
engineer
development
system
networking
working
backup
virtualization
disaster
systems
level
os
knowledge
nfs
firmware
test
recovery
linux
solaris
hands
excellent
soc
labs
storage
san
infiniband
sun
driver
software
oracle
tests
protocols
nas
kernel
hardware
device
background
drivers
hw
understanding
experience
programming
languages
candidate
python
debug
appliance
virtual

Cluster 4

benchmarks
manageability
databases
hardware
problems
market
algorithms
cluster
programming
availability
important
computer
scalability
server
storage
operating
exadata
data
oracle
vos
ms
clusterware
high
systems
asm
sql
rdbms
highly
file
processor
database
query
performance
rac
columnar
research
phd
group
memory
division
transaction
system
optimization
processing
network
scheduling
technologies
language
designing
future

Cluster 5


technology
management
essbase
obiee
member
languages
science
existing
ws
qualifications
actions
linux
handy
jms
unix
corrective
java
srvlets
bs
ms
applications
jdom
servlets
knowledge
oim
jdbc
web
preferred
strong
ee
run
multi
rmi
soa
ejb
develop
years
oam
internet
analyze
jsp
recommend
results
xml
computer
identity
threading
team
windows
related

Cluster 6

analyzer
jmeter
response
network
achieve
improving
recorder
highest
hardware
reliability
make
web
programming
profiling
flight
server
products
java
technology
load
python
ee
status
drive
fusion
apps
bottlenecks
performance
jprofiler
areas
latest
psr
demonstrated
cpu
memory
tools
scalability
aspects
engineering
standard
elite
middleware
end
high
se
expertise
application
software
businesses
problem

Cluster 7

candidate
service
technical
drive
ready
innovation
senior
proven
ensuring
professional
rigorous
fields
bug
high
search
discovery
reviews
cloud
solution
secure
java
strong
scalable
code
big
principal
detail
end
passion
quality
talented
fixing
ee
highly
staff
unit
enterprise
experience
build
include
design
responsibilities
seeking
servlets
writing
framework
easy
member
related
oriented

Cluster 8

industry
opportunity
seeking
openstack
technology
devops
employment
continuous
build
processing
ruby
distributed
analytics
monitoring
large
big
services
develop
marketing
hadoop
data
service
spark
saas
cloud
public
drive
join
real
leverage
platform
scale
private
paas
solutions
business
engineers
engineer
building
techniques
part
agile
production
iaas
infrastructure
verification
blockchain
work
paced
bluekai

Cluster 9

geographically
background
operating
percolate
replication
complex
databases
consensus
motivated
projects
good
concepts
guard
group
distributed
limited
top
problems
valued
deal
bottom
system
fashion
ideas
availability
active
data
deliver
skills
software
proficient
sql
highly
timely
customer
talented
individuals
driven
programming
relational
build
supervision
proficiency
concurrent
solve
engineers
debugging
innovative
strong
database

Cluster 10

required
filesystems
performance
distributions
industry
engineered
unbreakable
infiniband
promotes
drivers
mainline
team
debug
oss
projects
open
driver
focus
device
oracle
vm
core
git
uek
linux
kernel
ocfs
general
developer
working
enterprise
btrfs
patches
exadata
role
source
xen
adoption
patch
community
rds
upstream
filesystem
hypervisor
stability
flagship
work
virtualization
large
developers

Cluster 11

implementation
independently
complex
members
ensure
practices
resolve
situations
role
engineering
internal
solutions
expertise
effectively
workshops
area
engagements
teamwork
manner
product
solid
customers
understanding
products
technical
pre
demonstrates
pocs
rapidly
works
sales
customer
team
creativity
issues
field
support
teams
limited
oracle
leadership
resources
successful
consultants
external
architecture
frequently
escalations
complete
manages

Cluster 12

communication
improve
parallelizing
client
patching
environment
frameworks
enabling
deployments
parsing
developing
operations
occurring
member
lifecycle
xml
services
complex
experience
premise
latest
skills
fusion
jmx
existing
critical
upgrade
excellent
applications
web
frequent
loading
product
english
software
apis
projects
cross
time
sdks
performance
providing
solve
equivalent
small
dynamic
orchestrating
reducing
application
spoken

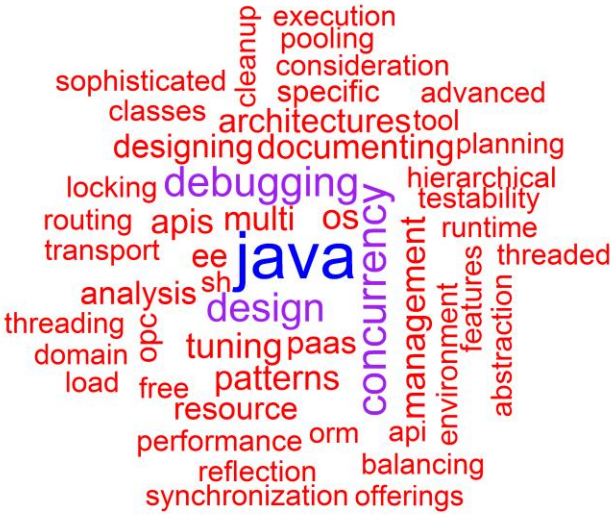
Cluster 13

programs
capability
troubleshoot
recovery
automate
specifications
enterprise
learning
orientated
automation
lifecycle
apps
fix
resolution
bugs
cases
test
suites
player
life
high
env
deliver
java
testing
skills
responsible
teams
perl
global
midtier
saas
fusion
execute
good
trouble
develop
involves
report
framework
track
products
applications
shooting
availability
debug
order
automated
python
previous

Cluster 14

unauthorized
customers external
internal hosting
concepts compliance
wide sensitive vulnerabilities
defense threats information
authentication audit provide consolidating
attacks secure
detect data oracle
protect group security member
gbu systems
desirable database key
groups access vault oci
application product cloud
management service sql
controls products building
encryption privacy
enterprise
firewall
assist
cryptography

Cluster 15


execution
pooling
consideration
specific
advanced
cleanup
sophisticated
classes
architectures
tool
designing
documenting
planning
locking
debugging
hierarchical
testability
routing
apis
multi
os
runtime
transport
ee
java
threaded
sh
analysis
design
threading
opc
tuning
paas
domain
load
free
patterns
resource
concurrency
management
environment
features
abstraction
performance
orm
api
reflection
balancing
synchronization
offerings

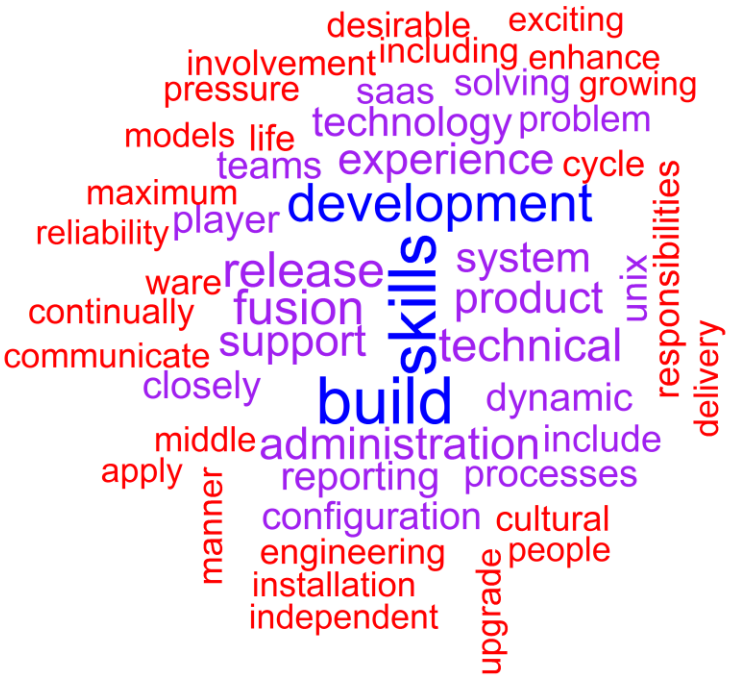
Cluster 16

identity
cloud
management
development
access
infrastructure
servicesoracle
idcsmanager
generation
product
design
implement
products
features
ibm
focus
involved
service
tasked
soa
directory
key
backend
ee paas
emerging
conferences
committees
team
architecture
public
fusion
security
provisioning
offering
architect
market
requirements
variety
ldap
party
standard
server
part
ui
managing
solutions
administration

Cluster 17

participate
infrastructure
independently
years
automated
infrastructures
leadership
specifications
agile
service
cloud
preferred
abbot
manual
integration
continuous
frameworks
teams
release
understanding
coverage
automation
jsf
test
technical
plans
selenium
testing
qa
jsp
processes
tools
quality
junit
work
identity
tests
development
involved
engineer
experience
lead
adf
home
required
oats
grown
candidate
jdeveloper
product

Cluster 18


desirable
exciting
involvement
including
enhance
pressure
saas
solving
growing
technology
problem
models
life
teams
experience
cycle
maximum
development
reliability
player
skills
system
ware
release
unix
responsibilities
continually
fusion
product
support
technical
communicate
closely
build
dynamic
delivery
middle
administration
include
apply
reporting
processes
manner
configuration
cultural
engineering
people
installation
independent
upgrade

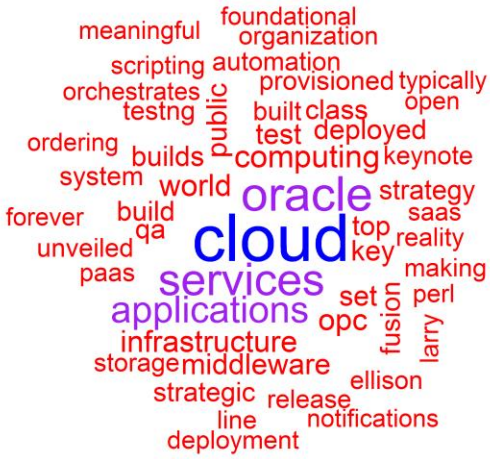
Cluster 19

familiarity
models
engineers
deployment
rapid
support
global
understanding
underlying
xen
automated
bgp
tools
automation
forwarding
development
datacenter
services
backbone
strong
software
devices
monitoring
large
network
restful
platforms
defined
complete
knowledge
networks
virtualization
linux
infrastructure
kvm
experience
growth
ip
protocols
networking
architects
configuration
scale
sdn
technologies
openvswitch
vlans
bridging
background
engineering

Cluster 20

interaction
understanding
physical
install
middleware
lifecycle
skills
projects
architects
frameworks
deep
customers
executives
applications
candidate
architectural
sql
center
oracle
fast
visible
tooling
paced
fusion
challenging
infrastructure
cloud
pl
extremely
including
leaders
responsible
technical
customer
spread
provisioning
successful
initiatives
provide
complex
degree
operations
leadership
products
substantial
position
includes
plays
excellence
directions

Cluster 21


meaningful
foundational
organization
scripting
automation
orchestrates
provisioned
typically
testng
public
built
class
open
ordering
test
deployed
builds
computing
keynote
system
world
oracle
strategy
forever
build
qa
cloud
top
saas
unveiled
key
reality
paas
services
making
set
perl
applications
opc
fusion
larry
infrastructure
storage
middleware
ellison
strategic
release
line
notifications
deployment

Cluster 22

enterprises
principle
professionalism
academic
continuing
component
effort
implementation
ownership
social
design
act
management
lifecycle
degree
participating
ultimately
technologies
patch
middleware
core
enable
fusion
global
complete
primary
consists
team
objectives
support
addition
facing
development
block
building
integrity
responsible
sql
oracles
distributed
years
intelligent
integrated
ddl
highly
interacting
outstanding
leverages
engine
taking

Cluster 23

troubleshoot
talented
private
expert
hiring
designer
provide
desktop
states
popular
restful
dom
developer
edge
end
json
javascript
latest
growing
team
creative
cutting
application
monitoring
web
experience
understanding
html
tools
utilize
ajax
css
writing
provisioning
spent
meets
front
phase
build
user
united
scrum
join
browser
specifications
services
resolve
professionals
prototype
preferably

Cluster 24

individually
complex
advanced
degree
standard
networks
code
develop
direction
definition
based
databases
developing
management
relevant
member
equivalent
customer
skills
tasks
programs
applications
ability
background
evolution
software
troubleshoot
active
bs
engineering
focus
idm
sustaining
members
strong
area
teams
debugging
identity
ms
operating
procedures
team
projects
debug
division
functional
related
practices
designing