

Rebuttal Report
Evaluating Whether Employment Outcomes for
Brokers and Broker Trainees at Merrill Lynch Are Racially Neutral

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I. Introduction

In this report, we respond to the comments and analyses of Dr. Ali I. Saad that are included in his report of November 14, 2008.¹ Because Dr. Saad's report summarizes work that took place over a year,² involves over \$10 million of effort, relies on new databases that have not been previously provided to us, and includes 146 pages of substantive results, it is not possible for us to review Dr. Saad's analyses with full attention to every calculation and analysis in the three months that we have been given to respond.³ Given these constraints, we first provide an overview of the areas where Dr. Saad agrees and those where he disagrees with the results in our initial report.⁴ Second, we respond to Dr. Saad's criticisms of the analyses included in our initial report. Third, we turn to the several important problems with Dr. Saad's analyses. There may be many other problems with his analyses that we do not review here, but given the constraints and the fact that these reports are only for purposes of class certification, we do not do so at this time.

Dr. Saad agrees with our assessment of the extent of racial differences in compensation at Merrill Lynch, as shown in Tables 1 through 6 of our initial report. These racial differences in compensation can arise for only two basic reasons: (1) African American Financial Advisors ("FAs") have different opportunities than white FAs to earn compensation at Merrill Lynch (i.e., racial discrimination); or (2) African American FAs are systematically inferior to white FAs in their job performance (i.e., racial differences in productivity that are independent of, or "external" to, any Merrill Lynch treatment that

¹ *Expert Report of Ali Saad, Ph.D. Regarding Class Certification Issues*, November 14, 2008.

² The computer backup that Dr. Saad provided in support of his report includes databases created in February of 2007.

³ As a professor at the University of Pennsylvania, Dr. Madden is also bound by the university's rules on outside consulting which limit her time to devote to this matter to one day a week.

⁴ *Evaluating Whether Employment Outcomes for Brokers and Broker Trainees at Merrill Lynch Are Racially Neutral*, *Expert Report of Janice Fanning Madden, Ph.D. and Alexander Vekker, Ph.D.*, June 5, 2008.

differs by race). We conclude that the evidence does not demonstrate that racial differences in compensation can be explained by the second reason, while Dr. Saad apparently believes that his analyses show that to be the case.

We provided evidence in our initial report that Merrill Lynch transferred fewer assets to African American FA trainees, called “POAs,” from the very beginning of the FA training or POA program, than it did to white POAs, and that the transfer differentials by race continue throughout the FA career. We find (as does Dr. Saad) that the largest racial differences in transfers occur at the time of entry to the POA program.⁵ These early disadvantages resulting from Merrill Lynch’s actions directly lead to fewer assets under management and lower production credits for African Americans, and more indirectly, lead to African Americans having fewer opportunities to attract new assets under their own management by using the transferred clients as a base for developing new clients. Because the effects of an early disadvantage are cumulative in that they affect future productivity and therefore future Merrill Lynch assignments of various kinds of support such as account transfers, the racial differentials in early transfers also affect, or “racially taint,” measures such as production credits going forward.

We also provided evidence that African American POAs were less likely than white POAs to be included in pools and teams. Pool and team memberships increase growth in assets under management and therefore future compensation. By his failure to provide any alternative evidence, Dr. Saad appears to accept our study of racial differentials in pooling and teaming opportunities for POAs. We also found that the differentials in pooling and teaming by race continue throughout the FA career. Dr. Saad incorrectly alleged that errors in our analyses account for the results for FAs and that, when corrected,

⁵ Dr. Saad’s Exhibit 3 shows that white POAs receive an average of \$404,482 more in asset transfers than do African American POAs in the initial month of the program. Dr. Saad also finds that, even ignoring the information that he has that there are also smaller transfers going to African Americans in succeeding months, for this initial month alone the racial difference is more than two standard deviations. We are surprised that he would then go on to try to dismiss this finding by saying that the *statistical significance* (which is already inaccurately measured due to his ignoring the rest of the data in the table) of this difference is “eliminated” by falsifying two data entries (Dr. Saad report p. 13). We have never seen such an approach used in any peer reviewed scientific literature. The technique of falsifying data to “eliminate” statistical significance has no place in accepted scientific methodology.

there are no racial differentials in pooling and teaming. We address Dr. Saad's allegations about these analyses in detail in Section IV of this report.

Dr. Saad apparently agrees with us that there is no difference in the productivity of African American and white FAs with respect to producing revenue on the accounts that Merrill Lynch transfers to them. In particular, by his silence on the matter, we assume that Dr. Saad agrees with our analyses that show that African American and white FAs are equal in their ability to produce production credits on accounts that are transferred to them.⁶

Dr. Saad asserts, however, that African Americans are systematically inferior to whites in generating new accounts as a result of a hypothesized difference by race in access to wealth among FAs who are employed in the same offices with the same length of time at Merrill Lynch. Dr. Saad further asserts that a hypothesized systematic difference in access to wealth affects the relative ability of African American FAs in the same office and with the same length of time at Merrill Lynch as white FAs to generate new accounts. He provides no explanation, however, as to why the hypothesized racial differences in access to wealth would create racial differences in the generation of new accounts, while having *no effect* on the selling of services to current Merrill Lynch clients (as evidenced by the performance of African American, relative to white, FAs in generating production credits (PCs) on transferred and current accounts). He also provides no explanation of why, if a racial differential in access to wealth were to affect the productivity of FAs, he finds large statistically significant racial differentials in total current production after controlling for the racial differential in production from self-generated accounts (which he proposes as a measure of differential access to wealth). We analyze

⁶ Merrill Lynch has produced documents in this litigation that support the same conclusion. John Zazzu (*FA Diversity Comparison: Data as of September 2003*, Human Resources Management Support & Analysis) reports that African American FAs have higher overall revenue velocity (which is revenue/assets) and revenue premium (which is revenue/production credits) than white FAs, after controlling for LOS. (MLE 0037-000271 and MLE 0037-000272)

Dr. Saad's evidence for and against a racial difference in access to wealth among similarly situated Merrill Lynch FAs in detail in Sections II and VI of this report.

In sum, Dr. Saad's criticisms of the analyses in our initial report are either incorrect or, when accommodated, lead to no change in the direction or overall statistical significance of the racial disparities that we report. Furthermore, much of Dr. Saad's own independent analyses, when properly reported and evaluated, support the conclusions in our initial report and undermine his own.

Section II of this report compares our results to those produced by Dr. Saad with respect to racial differentials in the compensation of FAs. Section III responds to Dr. Saad's criticisms of our analyses of account transfers to FAs and POAs. Section IV responds to Dr. Saad's criticisms of our analyses of racial differentials in pooling and teaming among FAs and reviews the uncontested racial differentials among POAs. Section V reviews the evidence of racial differentials in attrition for FAs and POAs. Section VI examines the numerous problems with Dr. Saad's theory of racial differentials in access to wealth among Merrill Lynch FAs and POAs. We also show that there is no empirical evidence that supports racial differentials in access to wealth as an explanation for the systematically lower production by African American FAs.

II. Compensation

In our initial report, we found that African American FAs earned 33 to 42% less in annual compensation than did white FAs with the same experience, education, office location, and management responsibilities in each year from 2001 through 2006 (pp. 11-19 and Tables 1-6). While these analyses controlled for length of service, time at Merrill Lynch, education, office location and management responsibilities, we did not add additional controls for the measures of productivity maintained by Merrill Lynch. As these productivity measures are affected both directly and indirectly by Merrill Lynch's decisions and policies with respect to office assignments, support staff assignments,

access to teams or pools, transferred accounts, and access to mentors, they are potentially tainted by racially discriminatory actions. Any analysis that includes them, then, is assuming there is no discrimination. An analysis that is premised on the assumption that discrimination does not exist cannot then be a test of whether discrimination does exist. We do not study, and are not aware that, Merrill Lynch applied any of its *compensation algorithms*, which use Merrill Lynch's productivity measures, differentially by race. Rather, the allegation of discrimination to be analyzed is whether there are racial disparities in Merrill Lynch's distribution of the various inputs that directly and indirectly affect FA and POA production or success. As Dr. Saad describes it, "total production is suspected to be improperly correlated with another variable of interest, i.e., race." (p. 31)

Dr. Saad's own analyses provided in the computer backup supporting his report confirm that: (1) total current production is, in fact, different by race at levels comparable to the compensation differentials that we have documented; and (2) the differences in current production between African American and white FAs *cannot* be explained by access to wealth as measured by self generation of accounts in the first three months as an FA, or even by self-generated accounts accumulated over the entire career.⁷ Specifically, Dr. Saad's computer backup shows his finding that: (1) African American FAs received 35.7% to 53.3% fewer current production credits, (ranging from 3.02 to 5.90 standard deviations difference) between 2002 and 2006 than did whites with the same experience *and the same levels of production credits on self-generated assets in their first three months as a POA*; and (2) African American FAs received 14.4% to 39.7% fewer current production credits, (ranging from 1.60 to 5.13 standard deviations difference)⁸ between 2002 and 2006 than did whites with the same experience and

⁷ We do not necessarily agree with Dr. Saad's characterization of accounts as "self-generated." We use his concept, however, for purposes of understanding and responding to his results.

⁸ Because the numbers of African American FAs included in these analyses are small, only 18 in 2002 for example, the tests for racial differences are less precise and have less power to detect discrimination or disparities were they truly to exist.

the same levels of production credits on total current self-generated assets. Because Dr. Saad also finds that production credits translate almost perfectly into compensation,⁹ these differences in current production credits by race for FAs with the same self-generated production, either early in the career or currently, translate into compensation differentials by race of the same magnitudes as those found in our initial report. Therefore, Dr. Saad's analyses are consistent with, and fully support, the conclusions in our initial report with respect to compensation. We explain Dr. Saad's findings and analyses in more detail below.

Dr. Saad's so called "Instrumental Variables" analysis, described in his report at pages 31-33 and partially reported in his Exhibits 21 and 22, actually finds that total production credits, which Merrill Lynch can influence and therefore can use to differentially affect (and compensate) African American FAs, are racially "tainted." Dr. Saad's description of how he performed this analysis in his written report seriously misleads the Court with respect to the analyses that he presents in Exhibits 21 and 22. He writes in his report that he used production credits on self-generated assets in the first three months of the POA program for Exhibit 22 to predict current "untainted" production and overall self-generated production (described as "stage one") for Exhibit 21 to predict current "untainted" production. He says that he then used that prediction as the measure of current production in the second stage. In fact, the computer output that Dr. Saad produced to verify the actual steps taken to calculate the results in his Exhibits 21 and 22 shows that this is not the case for his "first stage" analysis. Dr. Saad actually uses *race*, as well as the self-generated production measures and length of service (LOS), in the "first stage" to predict current production. Table R1a records Dr. Saad's "first stage" findings, as taken from his computer output (included in Attachment A to this report). Table R1a shows Dr. Saad's calculations of the effects of race on the potentially racially tainted variable, current production, after controlling for LOS and production credits from the self-generated accounts that the FA had in her first three months as

⁹ Dr. Saad's computer backup, Attachment A to this report, shows a coefficient of approximately 1 for the effect of current production credits on compensation.

a POA, which is a self-generated production measure less subject to Merrill Lynch's actions than the production credits from all self-generated accounts over a career. In his "first stage" regression results (Table R1a) Dr. Saad finds that African American FAs are getting approximately 35.7% to 53.3% fewer current total production credits than whites *with the same LOS and the same history of production credits on their self-generated accounts from their first three months as a POA.*¹⁰ The racial differences are highly statistically significant in every single year, ranging from 3 to almost 6 standard deviations.

A more specific example of what Dr. Saad's analyses in his Exhibit 22 really do may be helpful. For 2006, Dr. Saad takes an African American and a white FA with the same LOS and looks at their production from their self-generated assets accumulated during their first three months as a POA. For the white FA, he grows the self-generated production from the first three months into current production at the average rate or pattern generally experienced by FAs at her LOS. Dr. Saad then takes this calculated or expected "current production" and enters it as a determinant (a control variable) of the FA's compensation in the analyses that he performs in Exhibit 22. For the African American FA he does the same thing with an important exception. After calculating the expected current production based on the average growth trend from production of self-generated assets in the first three months to the current production for an FA with her LOS, Dr. Saad then reduces the expected "current production" by 48.6% (based on the coefficient of -0.486 reported in column 5 of Table R1a). So, rather than the expected current production that a white FA would receive, Dr. Saad discounts current production *based only on race* and enters that racially-discounted value of current production for the control value into the analysis of compensation in Exhibit 22. This reduction is made for all African American FAs, while all white FAs are expected to get the full average effect of their early production on their current

¹⁰ Since Dr. Saad's dependent variable is the natural logarithm of current production, each regression coefficient may be interpreted as the approximate percentage effect of the dependent variable of a unit change in the independent variable. However, the regression coefficient is only an approximate percent. To get the actual percentage p, one must compute $p = e^{\beta} - 1$ where β is the coefficient. For this coefficient, $e^{-0.357} - 1 = -0.300$.

production. As a result of this totally unjustifiable deduction from expected current production made only for African Americans, Dr. Saad yields his Exhibit 22 that shows no racial differential in compensation. The result occurs only because he made large, racially based deductions in the current production for African Americans only, a critical determinant of compensation in Exhibit 22. He systematically makes it appear as if African American FAs have less current production. Therefore, the true racial differential in compensation is “buried.” It appears as if African Americans are paid less because their current production, as estimated by production on self-generated assets, is lower. In fact, the racial differential in compensation is hidden by a systematic racially-based underestimation of their current production. The racially determined deductions in the expected current production are those that appear on Table R1a.

Table R1b records Dr. Saad’s findings on the “first stage” effects of race on the potentially racially tainted variable, current production, after controlling for LOS and production on all of the FA’s self-generated accounts (that is, the early career self-generated accounts and succeeding self-generated accounts that may have also been affected by any racially discriminatory Merrill Lynch distribution of inputs). He finds that African American FAs receive approximately 14.4% to 39.7% fewer current total production credits than white FAs *with the same LOS and the same production credits on their self-generated accounts*. These racial differences are highly statistically significant in every single year but 2003.

Dr. Saad tells us in his report that he is using “Instrumental Variables” to correct for a problem, which he describes as a correlation between the independent variables of race and production credits. Dr. Saad has not used this technique correctly. Instrumental variable techniques are not designed to deal with correlations among independent variables as he describes at page 31 of his report. If Dr. Saad believes that access to wealth differs by race, that a racial difference in access to wealth is the cause of

racial disparities in compensation, and that production on self-generated assets provide a measure of access to wealth, then all he need do is add this measure to our compensation regression analyses at Tables 1 through 6 of our initial report.

To evaluate the effects of Dr. Saad's claims about access to wealth with a correct econometric specification, we re-estimate compensation differentials for the groups of African American and white FAs that he includes in his Exhibit 22.¹¹ Table R2a shows the estimates of racial disparities in compensation for the FAs included in Dr. Saad's Exhibit 22 if we control only for the characteristics included in our initial report in Tables 1 through 6. Because we are starting with a group of FAs who are hired since 2000, there are few African Americans and the tests of statistical significance are less powerful than when all FAs are analyzed. Furthermore, the compensation differentials in the early years are smaller, but grow over time. For 2002, the estimated differential is 25.98% (and 2.12 standard deviations for the 18 African American FAs included); for 2003, the differential is 23.99%; for 2004, the differential is 34.52%; for 2005, the differential is 41.01%; and for 2006, the differential has grown to 41.09%. Table R2b shows the estimates of racial disparities in compensation for the FAs included in Dr. Saad's Exhibit 22 when we add Dr. Saad's control for racial differences in access to wealth—the production from self-generated assets in the first three months as a POA—as well as all of the other characteristics that we included in Table R2a. The alleged racial difference in access to wealth, as measured by any racial differences in production credits on self-generated accounts from the first three

¹¹ For his Exhibit 22, Dr. Saad includes all white FAs who are in an office that had at least one African American FA *at any point* between 2000 and 2006. While our studies have consistently included only white FAs in offices (or office complexes) in the years when there were both white and African American FAs employed the full year, we use Dr. Saad's unusual definition here to maintain consistency with his Exhibit 22 analyses. Some minor differences in our counts of African American and white FAs remain. These differences arise from inconsistencies in racial identifications within the Merrill Lynch databases. While we and Dr. Saad intend to include all white and all African American FAs, some minor variance in who is included remains because we rely on different fields within the Merrill Lynch databases to identify these individuals. Due to the time constraints, it was not possible for us to produce the analyses based on Dr. Saad's racial identifiers. These differences are very minor, however, and have no effect on the substantive results. We have also converted all statistical coefficients from regression analyses into percentage compensation differences. Dr. Saad has not done so. In his report, he reports the unconverted coefficients.

months as POAs, has little effect on the racial disparities in compensation for this group. For 2002, the estimated differential after controlling for “access to wealth” is 22.4% (Table R2b), compared to 25.98% without the control (in Table R2a); for 2003, the differential is 23.96% compared to 23.99% without a control for access to wealth; for 2004, the differential is 33.26% compared to 34.52% without the control; for 2005, the differential is 39.81% compared to 41.01% without the control; and for 2006, the differential is 39.41% compared to 41.09% without controlling for access to wealth. There is simply no evidence that, when properly estimated, access to wealth can explain the large racial disparities in compensation.

Essentially, then, both we and Dr. Saad find that African American FAs at Merrill Lynch receive substantially lower compensation than white FAs *because they have lower measured current production*. We and Dr. Saad also find that the lower current production cannot be attributed to differences in characteristics not influenced by Merrill Lynch, such as experience or education. Dr. Saad’s work shows, in fact, that the differences in current production also cannot arise from any attributes associated with differences in self-generated account productivity, either as measured by the accounts acquired in the first three months, or over the entire career, of the FAs in his study. Rather, the evidence supports the hypothesis that the racial differences in measured current production are attributable to racial differentials in resources and opportunities provided by Merrill Lynch.

Dr. Saad’s demonstration that racial differences in production earned from self-generated accounts do not explain the large differential by race in current production credits and current compensation, belie his assertions that a racial difference in access to wealth among Merrill Lynch FAs, which he alleges is external to Merrill Lynch, could somehow account for observed differences in compensation. Given these findings, we cannot understand how Dr. Saad concludes that any of the other analyses which he conducts, which we review in Section VI below, provides evidence that a systematic inferior productivity of African Americans, rather than differential treatment after arriving at

Merrill Lynch, can account for the racial differences in Merrill Lynch's current production measures that lead to large differences in compensation.

Dr. Saad also asserts that racial differentials in certifications, rather than in education, account for compensation differentials by race (see his discussion at pages 67-68 of his report, especially footnote 124). We controlled for education in our analyses of compensation (Tables 1 through 6 of our initial report) because education is a characteristic that FAs have when they arrive at Merrill Lynch. Merrill Lynch generally has no effect on the education of FAs. Certifications, however, are different. On his Exhibit 62, Dr. Saad presents data for 2006 on the proportions of white and African American FAs who hold certifications that count for 2 points in the Merrill Lynch ranking system.¹² The opportunities to obtain these certifications are often based on outcomes as employees that are affected by Merrill Lynch actions. For example, the Wealth Management Advisor (WMA) certification requires that the FA have at least 10 clients with over \$1 million invested at Merrill Lynch.¹³ Private Wealth Advisor (PWA) must agree that the smallest relationship opened will be \$10 million and, from 2005, that half of total production must come from relationships of clients with \$10 million or more invested.¹⁴ For these reasons, certifications are potentially "tainted" for the same reasons that Merrill Lynch's measures of current production credits are "tainted."

To assess the role of certifications on racial disparities in compensation, we examine how more external industry certifications,¹⁵ as opposed to internal Merrill Lynch awarded and managed

¹² Dr. Saad's Exhibit actually indicates that the data are for 2005. Based on his computer backup for this Exhibit, the 2005 date appears to be a typo. The Exhibit is for 2006.

¹³ See compensation plans (MLE 00040-000869, MLE 00012-000155, MLE 00040-000668, MLE 00113-000094, MLE 00040-000605, and MLE 00040-000570).

¹⁴ See compensation plans by year (MLE 00040-000869, MLE 00040-000669, MLE 00113-000096, and MLE 00040-000606).

¹⁵ The external certifications included are Chartered Retirement Planning Counselor (CRPC), Certified Financial Planner (CFP), Chartered Financial Consultant (ChFC), Chartered Financial Analyst (CFA), and Certified

certifications, affect compensation.¹⁶ Our analyses of compensation disparities by race do not change when we include controls for industry certifications. The finding that there are statistically significant disparities in compensation by race remains. Table R3 shows the racial disparities in compensation for 2006 before and after the inclusion of certifications in the analyses. The first column shows a compensation disparity of 42.34% and 9.07 standard deviations in 2006 for African American FAs relative to white FAs with the same length of service as an FA, same time as a Merrill Lynch employee, same educational attainment, in the same office, and with the same management responsibilities. This is the same result that was reported in column 1 of Table 6 in our initial report. The second column shows a similar compensation disparity of 41.43% and 8.93 standard deviations in 2006 for African American FAs relative to white FAs who are the same with respect to the characteristics used for the first column, *but who also have the same industry certifications*. In other words, certifications account for a miniscule amount of the racial disparities in compensation.

We now turn to Merrill Lynch practices that can lead to the observed racial differences in current production among FAs with the same production from self-generated accounts.

III. Account Distribution

We performed three sets of analyses of account transfers in our initial report. We presented one set of analyses (Table 7 and our discussion at pages 29-33) using data on total transfers by year and by month to FAs that showed that African American FAs received fewer total transfers annually than whites of equivalent experience regardless of whether we evaluated transfers according to their asset values or their commissions/production credits. A second set of analyses (Table 8 and our discussion at

Investment Management Analyst (CIMA). The data provided by Merrill Lynch on certifications do not appear to be complete for the entire period. Dr. Saad only uses these data for 2006 and we do the same.

¹⁶ Dr. Saad also asserts that certifications affect account distributions. We address this issue in our discussion of account distributions in the next section.

pages 34-37) used data on individual transferred accounts and showed that the accounts that were distributed to African American FAs were of lower quality (in that a higher asset value account, an account belonging to a household with over \$250,000 invested at Merrill Lynch, and a higher commission account) were less likely to be transferred to an African American FA than to a white FA. A third set of analyses (Table 14 and our discussion at pages 43-46) showed that African American POAs received fewer transfers than white POAs in the same month of the POA program, and that the largest differences in transfers by race occurred at the beginning of the program. We review each of the issues that Dr. Saad raises about these analyses in detail below.

Racial Disparities in Distribution of Accounts to FAs

Dr. Saad raises a minor technical issue with respect to our analyses presented in Table 7. He points out that a different approach to clustering results from the same FA was used in producing some of the estimates. This issue has no substantive effect on our results. The racial disparities reported in our initial Table 7 remain, regardless of how multiple entries of the same FA are considered in the analysis. Table R4a repeats Table 7 from the original report, but addresses Dr. Saad's concerns by using the same cluster approach for treating multiple entries of the same FA in different years. The differences from the original Table 7 are minor and occur only for the monthly analyses. The results reported in Table R4a support the same conclusions as those reported in Table 7 from our initial report: African American FAs receive fewer transferred accounts than do white FAs of similar experience and office location.

The issue that Dr. Saad raises of controlling for office complexes, rather than individual offices, in analyzing transfers is a matter of scientific judgment, not of error. Office complexes are the preferred location measure for several reasons. First, while there are reasons external to Merrill Lynch for African American FAs to be distributed across locations or office complexes differently than white FAs, there is

no similar external basis for African American FAs to locate in systematically different offices *within an office complex*. African Americans reside in different regions of the country and in different parts of metropolitan areas than whites. For example, African Americans are less concentrated in the western and more concentrated in the southern U.S. and, within metropolitan areas, are more likely to be located in central cities, while whites are more likely to be located in the suburbs. For these reasons, African American FAs may not have the same distribution across Merrill Lynch office complexes as white FAs do. Office complexes, which include offices within the same region, are appropriate ways to control for the potential residential location differences (central city versus suburbs and region of the country), by race. Second, controlling for office as opposed to office complex reduces the number of transfers studied, which limits sample sizes, making statistical analyses less powerful. Third, there are no “external” to Merrill Lynch explanations of why, within the same office complex, FAs in offices with African Americans would systematically receive fewer transfers than those in offices without African Americans.

While office complex is the preferred control for location differences by race that are truly external to Merrill Lynch, we nonetheless repeat the analyses using office as the location measure to show that the racial disparities in account transfers remain even using this inappropriate and potentially tainted location control. These analyses also cluster results for multiple observations on an FA. These results appear in Table R4b.

Our results reported in Table R4b seem in disagreement with Dr. Saad’s statement, “By accounting for the clustering issue and removing account transfer data records where there is no African American FA present in the same year, month, and office, the Madden/Vekker monthly transfer analyses reveal large, statistically significant *positive, i.e., non-adverse* findings for African American FAs” (pp. 37 to 38). Dr. Saad also indicates that he found another error related to our “office definition” (p. 38). In fact, we made no error. Rather Dr. Saad’s so called findings of favorable effects for African

Americans that Dr. Saad reports are the result of his own errors in using a data field included in our database (among several such unused variables on the database) that we never used or represented as accurate, and therefore never checked or verified, to define office for his own analyses. There is no error in any calculation that we performed or reported. When we now perform the analysis correctly that Dr. Saad reports, and use an accurate office data field rather than the inaccurate one that he uses to produce his reported contrary result, we get the results reported in Table R4b. These results show that, regardless of whether office complex or office is used as a location indicator and of how multiple entries on the same FA are included, African American FAs receive significantly fewer transfers from departing brokers than do whites at the same locations with the same experience at Merrill Lynch.

Finally, we examine whether certifications explain the racial disparities in transfers for FAs, as alleged by Dr. Saad in his report (p. 67). As discussed in the prior section on compensation, the opportunities to obtain certifications, especially those that are internal to Merrill Lynch, are often based on outcomes as employees that are affected by Merrill Lynch actions. As discussed above, the Wealth Management Advisor (WMA) certification requires that the FA have at least 10 clients with over \$1 million invested at Merrill Lynch. Private Wealth Advisor (PWA) must agree that the smallest relationship opened will be \$10 million and, from 2005, that half of total production must come from relationships of clients with \$10 million or more invested. For these reasons, certifications are potentially “tainted” for the same reasons that Merrill Lynch’s measures of current production credits are “tainted.”

To assess the role of certifications on racial disparities in transfers, we examine (as we did for compensation) how a more external industry certification, as opposed to internally awarded and managed certifications, affects transfers.¹⁷ Our analyses of racial disparities in account transfers to

¹⁷ We are examining the direct and indirect effects of certifications on transfers; we are not weighting these certifications by the points that Merrill Lynch awarded for them at various times in their ranking process. Our analyses are designed to examine how these credentials affect transfers *both* directly and indirectly. The direct

FAs¹⁸ do not change when we include controls for industry certifications. The finding that there are statistically significant disparities in account transfers by race remains. Table R4c shows the racial disparities after the inclusion of certifications in the yearly analyses of transfers that we analyzed in Table R4a.¹⁹ The results are very similar to those in Table 3Ra, showing that African American FAs receive fewer transferred accounts than do white FAs of similar experience, office location, and certifications.

Effect of Transfer Account Characteristics on Race of FA Recipient

In our initial report, we concluded that African American FAs who received accounts from departing brokers were disadvantaged relative to white recipients because they received inferior accounts, that is, accounts that had lower asset values, lower production, and were less likely to belong to households with over \$250,000 invested at Merrill Lynch. This conclusion was based on a series of regression analyses that examined which characteristics, if any, of a transferred account affected whether the account was transferred to an African American or a white FA (see our initial report at pp. 34-37 and Table 8).

Dr. Saad criticizes this set of analyses because they include only transfers to individual FAs. He proposes an alternative (his Exhibit 24) that includes transfers to pools and teams. This does not seem a reasonable way to examine whether a *recipient FA's race* affects which individual accounts she receives

effect would be reflected in the Merrill Lynch assignment of points; the indirect effect is the result of an FA having greater capacity or productivity as the result of the training that the certification reflects. Both may affect transfers and therefore the measured racial disparities.

¹⁸ Note that certifications are not relevant for POAs.

¹⁹ As noted above, Merrill Lynch does not appear to have maintained complete records on when a certification was obtained, as opposed to when enrollment for the certification started. Time limitations forced us to simply count an FA as having a certification for the entire period if Merrill Lynch records show her as having enrolled in that certification program. While this introduces "noise" into the analyses, there should be no racial bias. And certainly, for the end of the period, these data must be temporally accurate. 2006 shows similar results as those for the earlier years in which the data may be less accurate.

from a departing broker. Pools or teams, which are made up of more than one person, do not have a clear racial identity. African American FAs who received transfers as pool members were at least 30 times more likely to have pooled with white FAs than with African American FAs. African Americans in the mixed race pools may have shared in transfers that were meant for them, for the entire pool, or for the white FAs in the pool. We cannot tell. If we want to know whether an individual account's characteristics affect whether the account is transferred to an African American or a white FA recipient, the clear test is to look at accounts that are distributed to an individual FA where the race of the recipient is unambiguous.

As Dr. Saad's only criticism of this study was its failure to include pools and teams, and as that criticism makes no sense given the purpose of the analysis, Table 8 from our initial report is the best evidence of whether account characteristics affect whether the account is transferred to an African American or a white FA.

Racial Disparities in Distribution of Accounts to POAs

Dr. Saad asserts that we made several errors in our study of racial differences in transfers among POAs at Merrill Lynch. He correctly reports that we made a coding error that resulted in POAs who had not completed the program being counted as recipients of no transfers for the additional months they had remaining to complete the program. He also correctly reports that a few transfers made by POAs to themselves were mistakenly included as transfers. When we correct these errors,²⁰ as shown in Table R5a, we note that they were hardly "enormous errors" because they have virtually no effect on the results reported in our initial Table 14. The correction shows that the coding errors do not

²⁰ We also discovered two other coding errors that occur in both our Table 14 and in Dr. Saad's Exhibit 3. We all have made a matching error when selecting only those offices or office complexes that included both African American and white POAs. Basically, the match occurred only when a transfer occurred, so mixed race offices and office complexes with no transfers were incorrectly eliminated from the analyses. We all have also inaccurately omitted some POAs in mixed race complexes (offices) who never received any transfers. These coding errors are also corrected in the results.

alter the finding in our initial report that African American POAs receive fewer transfer dollars than whites or that the racial differentials are largest in the early months of the program.

As we explained in our initial report, an independent statistical test of the differences by race for each month of the POA program ignores the dependence across months, and therefore the information included in the other racial disparities shown for the remaining months on Table R5a. For that reason, we relied on the overall test of differences across the 28 months, a test that Dr. Saad has not challenged. Table R5a shows that 26 of the 28 months show African American POAs receiving lower transfers than white POAs in the same office complexes and at the same month in the program (Table 14 from our initial report also showed 26 of 28 months with African American POAs receiving lower transfers). 26 of 28 months would show African Americans receiving fewer transfers were there no difference by race is 0.0000001 on a one tail test, or 0.0000002, 2 in 10,000,000, converting to a two tail equivalent. This is comparable to a difference of 5.20 standard deviations.

Dr. Saad also alleges that we erred by controlling for office complexes, rather than individual offices, in analyzing transfers. For all of the reasons discussed above in the section on transfers to FAs, this is not an error. Office complexes are the preferred measure of location here for the same reasons as they were for the FA analysis. Nonetheless, we repeat the POA analysis reported in Table R5a, but using office rather than office complex, in Table R5b. Table R5b shows that 25 of the 28 months show African Americans receiving lower transfers than white POAs in the same office complexes and at the same month in the program did. The likelihood that 25 of 28 months would show African Americans receiving fewer transfers were there no difference by race is 0.0000015 on a one tail test, or 0.000003, 3 in 1,000,000, converting to a two tail equivalent. This is also comparable to a difference of 4.67 standard deviations. Table R5b based on individual office locations, like Table R5a based on office complexes, shows greater racial disparities in transfers at the very start of the POA program.

Finally, Dr. Saad alleges that we used the wrong test of statistical significance for the individual line items (the differences within months in the program). Dr. Saad does not object, however, to the statistical test that we stated was the appropriate test of whether there is an overall pattern of African American POAs receiving fewer transfers throughout the POA program. That test shows a significant disparity by race after correcting for the coding errors (Table R5a) and even when using office as the control for racial differences in geographic locations (Table R5b).

Even Dr. Saad's own revisions support our conclusion. For the table as recalculated by Dr. Saad, (his Exhibit 3), making all of his proposed changes including office rather than office complex, there are 19 of the 28 months (and 9 of the first 10 months) that show African Americans receiving lower transfers than white POAs in the same offices and at the same month in the program did. The likelihood that this could occur were there no difference by race is .0178 on a one tail test, or 0.0356 on a two tail equivalent, comparable to a difference of 2.10 standard deviations. He uses a tobit regression analysis, which we have used for multivariate but not bivariate analyses, to conduct a biased test for racial disparities in each month of the POA program. Dr. Saad's test of individual months is biased because it assumes that each cell is completely independent of the other cells. Dr. Saad's test of statistical significance assumes the account transfer decisions in each month of the POA program are made with a different (independently determined) policy, by different (independent) decision makers and with respect to different (independent) POAs. A test which corrected these obviously inaccurate assumptions would show greater statistical significance for each month. The better test, however, is the test we use for the entire POA program, a test for which Dr. Saad offers no alternative.

Dr. Saad argues for the use of the tobit in the bivariate analysis based on the skewness of the data.²¹ He also indicates that "bootstrapped confidence intervals" are a better test than the t-test that

²¹ While the data are skewed, they are not as skewed as he reports in his footnote 19. We never run the t-test to which he objects across all MLOS categories. He reports skewness, however, for such a test.

we used in our initial report. He does not mention, however, that the bootstrap test is also a better test than the tobit that he used. Because the tobit requires several restrictions, including the assumption that the size of the racial differential in receiving any transfers is the same as the size of the racial differential in transfers received for those who do receive, the bootstrap approach is preferred. Table R5c repeats the analysis reported in Table R5a, but uses the bootstrap test of significance, rather than the t-test for differences within each MLOS in the POA program.²² The bootstrap test shows 17 MLOS cells as individually and independently statistically significant, while the t-test on the same data in Table R5a shows similar results. Both approaches confirm that the racial disparities are larger in the beginning of the program.

The results from our initial report showed that African American POAs receive fewer transfers, especially in the early months of the POA program, than white POAs. If we correct the coding errors noted by Dr. Saad and control for location using office (or office complex), it is still the case that our analyses, as well as Dr. Saad's own analysis, are consistent with African American POAs receiving fewer transfers, especially in the early months of the POA program, than white POAs.

IV. Teams and Pools

Dr. Saad criticizes our analyses of teaming and pooling referring to so-called "critical flaws," a term that he never defines and that is not commonly used in scientific studies. He raises a conceptual objection that has no merit and some technical issues that also have no bearing on the finding that African American FAs and POAs are less likely than comparable whites to be included in pools and teams at Merrill Lynch. He also criticizes our analysis of the benefits of pools and teams. We reply to these criticisms below.

²² The bootstrap test still ignores the dependence in outcomes across the various MLOS cells, as does the t-test and the tobit. The correct test is our overall test of the pattern of racial disparity, a test which Dr. Saad has not challenged.

Participation in Teams and Pools

Dr. Saad's conceptual objection to our teaming and pooling analyses has no merit. He implies that it is necessary for us to model the "actual pooling process" in order to assess racial differentials attributable to Merrill Lynch. Dr. Saad is wrong. The only "model" issue relevant to a study of whether there are racial differentials in pooling and teaming is that participation is not external to Merrill Lynch (in the way that residential locations of African Americans and whites are). This is obviously the case. Pooling and teaming among brokers creates "internal" groupings of brokers. The details of the ways that pools and teams are created are designed, and ultimately controlled, by Merrill Lynch. Obviously pools and teams are instruments that Merrill Lynch has designed as part of its management of broker activities in order to further its own interests. These are activities that Merrill Lynch encourages among FAs by effectively increasing compensation to participants.²³ Pool and team memberships must be approved by management when they are formed and in each succeeding year that they continue. There is no basis for any contention that pools and teams are somehow "external" to Merrill Lynch or that participation is beyond its control.

Because membership in all teams and pools must be approved each year by management,²⁴ we conducted our study of participation in teams and pools among African American and white FAs who are employed full time for the full year and in office complexes that include both white and African American FAs. If one were to evaluate the racial differential in teams and pools controlling for the racial composition of FAs when each team was formed, the results would be no different because there has

²³ Note that we showed in our original report (pp. 14-19 and Tables 1-6) that racial differentials in teaming and pooling account for some of the racial differentials in the compensation of FAs. We also found that racial differentials in teaming and pooling account for some of the racial differential in attrition among FAs (pp. 39-40 and Table 11) and among POAs (pp. 41-42 and Table 12). Dr. Saad, by his silence on the issue, appears to agree with these findings.

²⁴ Dr. Saad's report, p. 48.

been no material change in the representation of African Americans among full FAs in the life of most of the teams. Dr. Saad incorrectly argues that there is a timing mismatch in our study of pools and teams among FAs because “many pools...were formed before 2001, at points in time when the proportion of African American FAs at Merrill Lynch was lower.”²⁵ In other words, Dr. Saad thinks that the proportions of African American FAs were much lower when white FAs were selected into the pools and teams, so that we have over-estimated the shortfall for African Americans.

There have not been increases in the representation of African Americans among FAs. Dr. Saad is incorrect with respect to the populations that we study and compare in Table 9 in our initial report. Dr. Saad cites a document, *Trend FA Headcount* (MLEE 060 048917), as indicating that African Americans were 1.6 percent of all FAs in 1996 and 1997, but were 2.1 percent of FAs in 2002. These data are not relevant, however, to changes in representation for the group that we study. The document (and percentages of African Americans) that Dr. Saad cites includes FA trainees (i.e., POAs and PDPs), a group for whom the African American percentage has increased over time but a group not included in our Table 9 analyses. A document prepared by Merrill Lynch PC HR Management Support and Analysis (MLE 00799 – 00191-2) reports the African American share of “Full FAs,” which removes the trainees who are also not included in our analyses of racial differentials in pools and teams among FAs.²⁶ The Merrill Lynch HR document indicates that African Americans were 1.3% of full FAs in 1998, 1.2% in 1999, 1.3% in 2000, 1.4% in 2001, 1.5% in 2002, 1.5% in 2003, 1.4% in 2004, and 1.4% in 2005. These data provide no evidence of a growing representation of African Americans among full FAs. Similarly, Dr. William Bielby (p. 9, Table 2 of his report²⁷) shows the proportions of African Americans

²⁵ Dr. Saad’s report, p. 15.

²⁶ Our analyses also include producing managers who account for a small share of FAs and an even smaller share of African American FAs.

²⁷ *Expert Report of William T. Bielby, George McReynolds et al. v. Merrill Lynch, Pierce, Fenner & Smith, Incorporated June 5, 2008.*

among Merrill Lynch FAs after excluding POAs and also finds the percentage to vary between 1.4 and 1.3 percent, with no time pattern, for the 2001 through 2006 period.²⁸ Finally, the data that Dr. Saad cites are not restricted to comparisons of proportions of whites and of African Americans in Merrill Lynch offices that include both African American and white FAs.²⁹

Even if Dr. Saad's allegations that the proportions of African Americans in 2001 through 2006 overstate their proportions in earlier years were accurate, they have absolutely no relevance to our study of teaming and pooling among POAs (pp. 46-47 and Tables 16a and 16). The POA study includes pools and teams created only in the 2001 through 2006 period. Dr. Saad has little to say about our evidence that racial disparities in teaming and pooling start in the POA program. He comments that there is a problem with our analyses because we "benchmark" the POA population at year end and there is high attrition. He suggests that a monthly analysis would be more appropriate. He never conducts such an analysis nor provides any evidence that it would lead to a different result. Our findings of substantial and statistically significant differences by race in participation in pools and teams during the POA program and that these differentials account for some of the racial differentials in the likelihood of completing the POA program are essentially unchallenged.

Benefits of Teams and Pools

In our initial report, we documented a variety of benefits from participation in teams and pools. In particular, we showed that the lower participation rates of African Americans in teams and pools accounted for part of their compensation differentials with whites (pp. 13-19 and Tables 1-6), increased their likelihood of leaving their Financial Advisor titles (pp. 39-40 and Table 11), increased their

²⁸ As the experts have not been given data on brokers prior to 2000, it was not possible to perform independent analyses of these issues before 2000.

²⁹ Even in the data table used by Dr. Saad, which covers a different population than the one that we analyze, Dr. Saad appears to have *strategically* picked the years that he cites: in an earlier year (1994) African Americans accounted for 1.95% of the FAs at Merrill Lynch.

likelihood of leaving and/or not graduating from the POA program (pp. 41-43 and Tables 12-13), and led to fewer accounts under management (p. 38 and Table 10).

Dr. Saad is silent (thereby implying agreement) about our analyses demonstrating these advantages with the exception of the last one, that participation in teams and pools increases an FA's number of accounts under management. In our discussion of Table 10 at page 37 of our initial report, we explain that pools and teams allow FAs and POAs to increase their total assets under management especially when they were able to increase their share of the pool or team. Our initial report's Table 10 measures whether there were racial differentials in the likelihood that FAs saw an increase in the value of their assets under management increased *due to an increase in the FA's share of a pool*.

Dr. Saad raises three issues about Table 10. He (1) alleges that it is "strange;" (2) criticizes our failure to cluster FAs who appear more than once in the analysis; and (3) criticizes the inclusion of FAs who did not have an increase in share in the analysis. We deal with each of these issues in detail below.

Dr. Saad alleges that this is a "strangely defined subset of pool activity" because it does not consider the growth in assets within the pool. Our analysis is what it is and what it purports to be. While we agree that growth in assets within the pool does increase assets under management, that outcome is not unique to pool or team participation. Assets can grow when managed in a pool or when managed by a lone FA. The growth in assets, therefore, is *not* a benefit unique to pool or team participation. Certainly, an increase in assets due to an increase of the share of that pool or team is an increase in assets under management that is unique to team and pool participation.

Dr. Saad argues that we should have structured our analysis to cluster the FAs who appear more than once because the analysis is for FAs by year and many of the same FAs are included in each year. This is a fair comment and we have repeated our Table 10 clustering these FAs; the results appear in Table R6. This change does not affect the size of the African American disadvantage, that is, the estimated dollars in asset values under management for not sharing in these positive changes in pool or

team shares. It does affect the standard deviations. In this case, it happens to decrease the number of standard deviations, although both for pools and teams, the decrease in assets under management for African Americans remains statistically significant at the standard of two to three standard deviations.

Dr. Saad's last criticism, like the first, makes no sense in the context of conducting an analysis to ascertain the effects of increases in one's share of a team or pool on assets under management. Of course, to make this comparison, one must include FAs who had no increase as well as those who had an increase.

The only suggestion of Dr. Saad for change with respect to our measurements of the benefits of pooling and teaming that had any merit, had no effect on the finding that statistically significant disparities exist in benefits for African American FAs.

V. Attrition

Dr. Saad does not contest the accuracy of our attrition analyses for POAs and for FAs which showed large and significant racial disparities for FAs and POAs who entered their employment between 2001 and 2006 and who were in the same office. He also does not contest our analyses that show that racial differentials in teaming and pooling account for some of the greater attrition for African American POAs and FAs. Rather, Dr. Saad performs additional analyses that show that, if current production (a trait that his own analyses—see Section II discussion and Tables R1a and R1b—show to be racially tainted) is considered, then there are no racial disparities. We do not contest that finding because it misses the point. The point is *that racial disparities in the opportunities to earn production credits at Merrill Lynch (such as racial disparities in account transfers, access to teams and pools, and other aspects of employment that contribute to production) underlie racial differentials in attrition, as they also underlie racial differentials in compensation.*

VI. Access to Wealth

Dr. Saad asserts that he has evidence that African Americans employed as FAs at Merrill Lynch have systematically differential access to wealth than do whites in the same job and with equivalent education, experience, and work locations and that the hypothesized racial differential in access to wealth is completely beyond the control (i.e., external) of Merrill Lynch.³⁰ He asserts that this difference in access to wealth accounts for African American FAs having fewer self-generated accounts. Dr. Saad implies that this difference in access to wealth is the reason for the substantial differences in compensation by race that we find in our initial report and that Dr. Saad confirms in his report.

There are several problems with Dr. Saad's reasoning and with his empirical evidence. First, it is not clear why "smaller racial differentials" in self-generated accounts should account for "larger racial differentials" in compensation. Why should alleged differences in self-generated accounts by race contribute more to compensation than to the ability to generate business or production credits on all accounts under management (i.e., the velocity on accounts served)? Merrill Lynch has provided evidence, in fact, that African American FAs have greater velocity than do white FAs.³¹ More importantly, however, is the fact that Dr. Saad's own analyses (see Section II and Tables R1a, R1b, R2a and R2b) show that the racial disparities in compensation remain even after controlling for any racial differentials in production from self-generated accounts. Dr. Saad's own evidence of this racial differential in compensation after considering the potential effects of racial differences in self-generated accounts totally undermines his assertions that racial differentials in access to wealth among Merrill Lynch FAs and POAs could account for the observed racial disparities in compensation.

³⁰ Dr. Saad's report, p. 16.

³¹ Merrill Lynch's *FA Diversity Comparison: Data as of September 2003*, (MLE 00373-000261).

Dr. Saad does present some other empirical evidence, however, that we review here. In particular, he uses geocoding of the mailing addresses for Merrill Lynch accounts to assign race to Merrill Lynch clients and to develop maps showing the locations of FA clients. Not only do these analyses fail to refute Dr. Saad's other evidence that self-generated accounts do not explain racial disparities, they are also unreliable for the reasons we describe in detail below.

Geocoding

The exhibits that use geocoding of the mailing addresses for Merrill Lynch accounts (Dr. Saad's Exhibits 6 through 19) are based on data that were not provided to us before we received the computer backup supporting Dr. Saad's report. These exhibits are not reliable because they are based on incomplete data³² and have also been inaccurately geocoded. Dr. Saad incorrectly assumes that: (1) the account addresses that he received from Merrill Lynch, which do not include the last two digits of the address, are for the *residential* locations of Merrill Lynch clients; and (2) the income, race and housing values for Merrill Lynch clients in a census tract can be reliably characterized by the averages of these values for all residents at their census tracts.³³ Even were these assumptions accurate, however, Dr. Saad's numerous errors in the computer processing and geocoding of the addresses also make the analyses unreliable. We review each of these issues in detail below.

Account mailing addresses do not indicate the residences of clients. There are two reasons why the mailing addresses on accounts do not reliably represent the residential locations of Merrill Lynch clients. First, Dr. Saad did not use the available indicators on the account electronic files to eliminate

³² Dr. Saad could have assigned race more reliably with a full address and a name, as shown by Merrill Lynch's own prior analyses that are discussed below in footnote 34.

³³ It is not clear from Dr. Saad's report whether he matched these addresses to census tracts or to census block groups. Given the time constraints, we could not review all of the programs to see if they provided any information. Census tracts are geographic areas defined by the U.S. Census together with local participants that contain between 1,500 and 8,000 persons. They tend to be smaller than zip codes. Census block groups are smaller than census tracts (but are much larger than a city block).

from his analyses the accounts of institutions, businesses and organizations from those held by individuals or households. Obviously, an account belonging to an institution, business, or organization has no owner with a racial identification, personal income, or residential housing value. Because such entities are more likely to be located in central business districts and/or in the central city of a metropolitan area than are residences, the inclusion of the racial composition, income or housing values at their locations as indicators of those characteristics of individual clients lead to unreliable determinations of the race, income, or housing assets held by the clients of any FA at Merrill Lynch.

The second reason why mailing addresses on accounts do not indicate the residential locations of Merrill Lynch clients is that even when the account is held by an individual or a household – rather than by an institution, business or organization – the individual may nonetheless choose to have her account mailed to her workplace rather than her home. The U.S. Census data, which Dr. Saad used to assign a race, income, and housing value to a Merrill Lynch client address, are for residents, and not workers, in the census tract. Because Dr. Saad did not have access to the complete addresses (i.e., the last two digits of the address), which would have allowed him to determine whether many of the mailing addresses were, in fact, for a business or for a residence, he erroneously uses the characteristics of residents in a census tract to assign race to clients who are employees (and not residents) in the census tract.

The income, race and housing values of Merrill Lynch clients in a census tract, even where the census tract is for the residence, cannot be reliably characterized by the averages for all residents of the census tract. The race and income of individual or household account owners at Merrill Lynch are not available in the Merrill Lynch data. The characterization of an account owner's income or housing value by any of these characteristics, but especially her race, is problematic based on the census tract. One clear piece of evidence of the unreliability comes from the estimated proportions of accounts that

belong to African American clients, which Dr. Saad reports on his Exhibit 12. For white FAs, Dr. Saad estimates that approximately 6% of the accounts they manage belong to African American clients (and for African American FAs, his estimate is 24%). Had Merrill Lynch given Dr. Saad access to the names of the clients, he could have gotten a more reliable estimate. In fact, Merrill Lynch's own studies, which used all of the data available to them (full names and zip codes), indicate a far smaller incidence of African American Merrill Lynch clients.³⁴ The Merrill Lynch study, using primarily full names to identify race, found that less than 2% of accounts opened between 2002 and 2005 belonged to African American clients.³⁵ Dr. Saad's approach, based on data limited by Merrill Lynch, far overestimates the role of African American clients in the assets under management for both white and African American FAs.

There are apparently numerous processing and coding errors. While the data that Merrill Lynch provided to Dr. Saad do not allow him to reach any credible conclusions about the racial identity of the clients generated by, or served by, African American or white FAs, the unreliability is further complicated by numerous errors that Dr. Saad made in processing the address data. He did not geocode, and therefore omitted, most of the addresses that included "apt," "#," "unit," or "Fl," which account for over 15% of the addresses in the database. He also miscoded addresses with a leading "0," which account for almost 7% of the addresses in the database.³⁶ His software made arbitrary

³⁴ The analyses apparently were performed by Donnelly Ethnic Coding Process under the direction of the Multicultural Marketing Group. A document from December 2005 (MLE00202-000002-3) describes the 5-step match process used to assign ethnicity. The process rests primarily on names, using first name, surname, middle name and prefixes and suffixes of surnames. Zip code was only used to assign African American ethnicity for surnames common to another ethnic group. For example, names such as Nguyen are assigned as Vietnamese; any name ending in "oglu" is Turkish, etc.

³⁵ The Merrill Lynch study identifies a total of 70,709 accounts attributed to African Americans. The total number of accounts generated over the period is more than 4 million (MLE 00202-132-142).

³⁶ These include addresses such as 0 Walnut Street. Merrill Lynch's blocking of the last two digits of the address creates this problem. Addresses that are 2 through 98 Walnut Street, for example, all end up coded as 0. Rather than placing these address in the 0 hundred block (where 2 through 98) of Walnut Street actually belong, the addresses are either not geocoded or coded inaccurately. Also, Dr. Saad could have solved the problem by recoding all of the problematic 0-leading addresses with a single digit to place them in the first hundred block.

assignments in these cases, usually assigning the address to the midpoint of the street name in the metropolitan area rather than in the first (i.e. 0) hundred block of the street, but sometimes the software actually moved the address to a different county. For example, Dr. Saad assigned an address in the 0 hundred block of Fifth Avenue in Manhattan, to the Bronx, an entirely different county, and he assigned the 0 hundred block of South Michigan Avenue in Chicago to the 9700 block of South Michigan Avenue.

It also appears that the analyses do not include many accounts, and it is not clear why. We were not given the programs that generated the geocoded analyses. While we can see that some accounts are dropped from the analyses, we cannot tell why for many, because we do not have sufficient time to trace all of the decisions to include or exclude accounts that occur across the myriad of data manipulation programs that were provided by Dr. Saad.

The problems with the geocoding mean that the results that Dr. Saad discusses at pages 17 through 18 and lists in his Exhibits 6 through 9 and that he discusses at pages 24 through 27, and lists in his Exhibits 11 through 14 of his report are not based on reliable information about the race or income of Merrill Lynch's clients or of their distribution by geography to white and African American FAs. We turn to a more detailed discussion of the specific problems in these discussions and exhibits.

In the first panel of Exhibits 6 through 9, Dr. Saad purports to map the zip codes with the largest "concentration" of households with over \$1,000,000 invested with Merrill Lynch in Chicago, Washington DC, Detroit, and Atlanta respectively. These metropolitan areas are among the most racially segregated in the United States. The text of Dr. Saad's report, and his computer backup, indicate that the maps do not, in fact, count numbers of wealthy households. Rather, Dr. Saad computes the average household assets (total assets in zip code divided by the number of households having assets) and shades those zip codes where the average assets per household are over \$1 million. Obviously, this computation is

subject to large swings with respect to outliers in zip codes with small numbers of Merrill Lynch households.³⁷ A zip code with 10 households, 4 of which hold \$1 million in assets each and 6 households that hold \$100,000 each, would not be included, but a zip code with only 1 household having over \$1 million would be so shaded. Yet, the former zip code has a larger number of high asset households than the latter.

For example, in the actual data for the Chicago area, zip code 60104, which has a total of 31 Merrill Lynch households, 4 of which have assets in excess of \$1 million, is highlighted as having a concentration of wealthy households because the average for the 31 households is \$1,102,847. Yet zip code 60201, with 759 Merrill Lynch households, 144 of which have assets over \$1 million, is not shaded as having a concentration of wealthy households because the average asset value per household is \$854,613.

There is another major problem with the first panel maps shown in Exhibits 6 through 9. These maps include accounts that are serviced by FAs in offices and office complexes where there are no African American FAs. The exhibits, therefore, do not compare the white and African American FAs included in our analyses, which only included white FAs in those office complexes with African American FAs. The first panel maps on these exhibits, then, include information on clients served by white FAs who are not being studied by us and who are not relevant to the comparisons of similarly-situated African American and white FAs being made in this case.

The second panel identifies the zip codes in these same metropolitan areas where more than 10% of the assets under Merrill Lynch management held by households in the zip code are managed by African American FAs. The problems with these maps are similar to those for the first panel. First, the maps include all Merrill Lynch accounts, including those managed in offices that have no African

³⁷ Dr. Saad creates additional unjustified variation in these computations because he includes households to whom he attributes negative asset values when he computes average household values.

American FAs. The zip codes with a larger proportion of assets under the management of African American FAs may show nothing more than that the zip codes served by offices and office complexes with both white and African American FAs are geographically different from those served by offices and office complexes that include no African Americans. Because all analyses that we have conducted include only offices and office complexes with both African American and white FAs, these data are not relevant. Second, zip codes are more likely to show a greater share of clients who are under African American management if they include very few accounts.

Again, consider two zip codes, A and B. Zip code A has two accounts of \$100,000 each, one managed by an African American FA and the other by a white FA. Zip code A with few accounts will be shaded in the second panel maps. Note that every metropolitan area will have some A-like zip codes. Given the small numbers, most will not have 10% of the assets managed by African American FAs, but due to the outlier phenomena with small numbers, some will. Zip code B has 100 accounts, varying in assets over a large range, and is more typical of the zip codes serviced by Merrill Lynch. Zip code B accounts are managed proportionately by African American and white FAs (relative to their presence in Merrill Lynch offices). Because African American FAs do not account for 10% of the FAs, however, they do not manage more than 10% of the accounts in zip code B and B is not shaded. In this case, the map which shades some of the zip codes with small numbers (likely to be poorer zip codes) due to “swings” caused by outliers tells us very little about where African Americans manage their accounts relative to white FAs in the same offices and office complexes.

For example in the actual data for Chicago, zip code 60624 has 20 Merrill Lynch households, 2 of which are managed by African American FAs. So, this zip code is shaded as having “high concentrations of African American FA managed accounts.” Similarly, zip code 60104, with 31 Merrill Lynch households, has more (3.2) managed by African American FAs, as does 60155, with 31 Merrill Lynch households of

which 4.4 are managed by African American FAs, and 60636, with 30 Merrill Lynch households of which 5.2 are managed by African American FAs.³⁸ African American FAs are managing greater numbers of accounts in other zip codes, however, that are not shaded, but because the zip codes also have more Merrill Lynch households, African American FAs are not managing 10% of all the households within the zip code. As another example, zip code 60202, which Dr. Saad shades as having a concentration of high asset households because the 438 Merrill Lynch households using this as their mailing address have average assets of \$1,050,357, includes 11.8 accounts managed by African Americans. The total of 11.8 accounts managed by African Americans for zip code 60202, which is not shaded as an area with a concentration of African American managed accounts, is greater than the number of accounts managed by African Americans in all but three of the 29 Chicago area zip codes that Dr. Saad shades as having a concentration of African American FA accounts.

The third panel shows the zip codes where the racial composition of the residents is more than fifty percent African American. We note that several of the zip codes shaded in the first panel, that is those with “concentrations” of accounts in excess of \$1,000,000, are also shaded in the third panel, the areas where the residents are more likely to be African American. These maps show that even the most racially segregated metropolitan areas in the United States include neighborhoods with both high wealth Merrill Lynch clients and large representations of African Americans.

African American Clients

Based on race that is assigned using the unreliable geocoded addresses of Merrill Lynch clients, Dr. Saad alleges that, in their first three months as POAs, African Americans generate substantially more of their new accounts from African American clients than do white POAs. The study (Dr. Saad’s Exhibit

³⁸ The numbers of households managed by FAs are not necessarily whole numbers because Dr. Saad distributes accounts managed by pools based on the FAs share of the pool.

12) on which he bases his conclusions is ultimately unreliable for the reasons discussed above. The obvious problem with Dr. Saad's Exhibit 12 study of the proportion of Merrill Lynch clients who are African American is that he is greatly overestimating the representation of African American accounts for both white and African American POAs. In fact, even if the representation of African American clients were larger for African Americans, the proportion of accounts involved are so small (after removing the accounts of family members) for each racial group as to be immaterial to whether there are any differences between African American and white POAs in access to wealth.³⁹

Were we to accept Dr. Saad's geocoding as a reasonable technique for ascertaining the race of clients, however, we would find evidence consistent with the hypothesis that it was Merrill Lynch that directed its African American POAs to service African American clients. Using Dr. Saad's problematic technique to assign race to Merrill Lynch clients, we find that Merrill Lynch transferred African American clients to African American POAs (in their first three months as POAs) at greater rates than they did to white POAs. As shown in Table R7, of the assets transferred, on average, to African Americans in the first three months of their POA appointment, approximately 13% were assets that Dr. Saad's technique assigns to African American clients, while only 7% of the assets transferred to white POAs belonged to African American clients, a difference of 3.57 standard deviations. Dr. Saad's approach to assigning race to clients implies that Merrill Lynch steers African American clients to African American FAs and vice versa.

VII. Conclusions

The conclusions included in our first report have not been altered by any of Dr. Saad's analyses.

³⁹ Dr. Saad's Exhibit 12 is plagued by additional errors. His analyses reported in this exhibit erroneously count duplicate records for the same household as different households and he includes households who have negative asset values.

We all agree that African American brokers received compensation that is in the range of 30 to 45% lower than that received by white brokers of similar experience and education. Including a consideration of production on self-generated accounts—which Dr. Saad alleges is a measure of racial differentials in access to wealth—has virtually no effect on the magnitudes of these racial differentials in compensation. When African American and white FAs with LOS under 6 years⁴⁰ have equivalent experience and have generated equivalent production credits on self-generated accounts, African American FAs have between 15 and 53% less in current production credits. When African American and white FAs have equivalent experience and have generated equivalent production credits on self-generated accounts in their first three months as a POA, African Americans receive 25 to 40% lower compensation in their first six years on the job. Including controls for achievement of industry certifications—which Dr. Saad alleges is a measure of racial differentials in human capital—has virtually no effect on the magnitudes of racial differentials in compensation.

There is no evidence that there is a systematic differential in access to wealth by race when African Americans and whites come to employment as brokers or broker trainees at Merrill Lynch; there is no evidence that a systematic racial differential in access to wealth can account for the large racial differentials in compensation.

African American FAs and POAs were less likely than their white counterparts to have the advantages of participation in teams or pools with other brokers.

African American FAs and POAs received inferior account transfers than did white FAs and POAs of similar experience. The greatest racial differences in account transfers occur in the first few months of the POA program, but continue over the career. Adding controls for industry certifications— which


⁴⁰ The selection of this group of FAs came from Dr. Saad's study which required data on self-generated assets in the first three months of the POA program. These data were only available for FAs with less than 7 years experience because only data from 2000-2006 have been provided by Merrill Lynch.

Dr. Saad alleges is a measure of racial differentials in human capital—has no effect on the magnitudes of racial differentials in transfers.

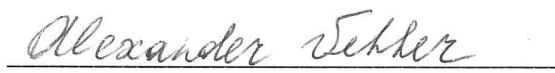
African American FAs and POAs were more likely to leave their jobs than were white brokers or broker trainees of similar experience.

When given equivalent accounts to manage, African American and white FAs produce equivalent amounts of production credits.

In sum, Dr. Saad's criticisms of the analyses in our initial report are either incorrect or, when accommodated, lead to no change in the direction or overall statistical significance of the racial disparities that we report. Furthermore, much of Dr. Saad's own independent analyses, when properly reported and evaluated, support the conclusions in our initial report and undermine his own.



Janice Fanning Madden, Ph.D.
February 23, 2009



Alexander Vekker, Ph.D.
February 23, 2009

<p style="text-align: center;">Table R1a Dr. Saad's Estimates of the Effects of Race on Current Production Credits, Controlling for Production on Self-Generated Assets in First Three Months as POA and LOS, 2002-2006</p>					
	2002 (1)	2003 (2)	2004 (3)	2005 (4)	2006 (5)
Coefficient on African American	-0.357	-0.393	-0.397	-0.533	-0.486
t-statistic	-3.02	-3.95	-4.59	-5.65	-5.90
Probability that Effect is Due to Chance	0.003	0.000	0.000	0.000	0.000
Number of African American FAs/Total Number	18/449	33/753	33/1040	36/1208	42/1391

Table R1b Dr. Saad's Estimates of the Effects of Race on Current Production Credits, Controlling for Production on Self-Generated Assets and LOS, 2002-2006					
	2002	2003	2004	2005	2006
	(1)	(2)	(3)	(4)	(5)
Coefficient on African American	-0.273	-0.144	-0.288	-0.397	-0.345
t-statistic	-2.62	-1.60	-3.74	-4.79	-5.13
Probability that Effect is Due to Chance	0.000	0.109	0.000	0.000	0.000
Number of African American FAs/Total Number	18/449	33/753	33/1040	36/1208	42/1391

Table R2a Compensation of Financial Advisors by Race, Controlling for Length of Service, Time at Merrill Lynch, Education, Office and Management Responsibilities, Using Financial Advisors in Dr. Saad's Exhibit 22					
	2002	2003	2004	2005	2006
	(1)	(2)	(3)	(4)	(5)
Estimated Percentage Compensation Difference for African American Financial Advisors	-25.98%	-23.99%	-34.52%	-41.01%	-41.09%
Probability Difference is Due to Chance	0.034	0.0088	0.0000246	0.0000000503	0.00000000340
Standard Deviations	-2.12	-2.62	-4.22	-5.45	-5.52
Number of African American FAs/Total FAs	18/449	33/751	34/1037	37/1205	43/1387

<p align="center">Table R2b Compensation of Financial Advisors by Race, Controlling for Length of Service, Time at Merrill Lynch, Education, Office and Management Responsibilities, And Adding Production on Self-Generated Assets in First Three Months of POA Program</p>					
Using Financial Advisors in Dr. Saad's Exhibit 22					
	2002	2003	2004	2005	2006
	(1)	(2)	(3)	(4)	(5)
Estimated Percentage Compensation Difference for African American Financial Advisors	-22.40%	-23.96%	-33.26%	-39.81%	-39.41%
Probability Difference is Due to Chance	0.0767	0.0085	0.00000472	0.0000000981	0.000000122
Standard Deviations	-1.77	-2.63	-4.07	-5.33	-5.29
Number of African American FAs/Total FAs	18/449	33/751	34/1037	37/1205	43/1387

Table R4a

**Effects of Race of Financial Advisors on
Yearly Asset Values and Prior Production Credits for
Accounts Transferred from Financial Advisors Departing
from Merrill Lynch and House Accounts, 2001-2006
(Censored Tobit Regression Analysis)**

(Using Only Office Complexes with Both African American and White Financial Advisors)

	Yearly Analysis, FAs Only		Monthly Analysis, FAs only	Monthly Analysis, FAs and POAs
	Controlling for Year (1)	Controlling for Year and Experience (2)	Controlling for Month, Year, and Experience (3)	Controlling for Month, Year, Experience, and FA Job Title (4)
<i>Estimation I</i>				
Total Asset Value at Transfer				
Tobit Coefficient	-1,385,940	-1,387,527	-710,113	-722,806
Standard Deviations	-2.83	-2.75	-2.93	-3.84
Probability Effect is Due to Chance	0.0047	0.006	0.0034	0.0001
<i>Estimation II</i>				
Prior Year Commissions				
Tobit Coefficient	-5,766	-5,618	-3,119	-3,127
Standard Deviations	-3.23	-3.13	-3.32	-4.76
Probability Effect is Due to Chance	0.0012	0.0017	0.001	0.000002

Table R4b

**Effects of Race of Financial Advisors on
Yearly Asset Values and Prior Production Credits for
Accounts Transferred from Financial Advisors Departing
from Merrill Lynch and House Accounts, 2001-2006
(Censored Tobit Regression Analysis)**

(Using Only Offices with Both African American and White Financial Advisors)

	Yearly Analysis, FAs Only		Monthly Analysis, FAs only	Monthly Analysis, FAs and POAs
	Controlling for Year	Controlling for Year and Experience	Controlling for Month, Year, and Experience	Controlling for Month, Year, Experience, and FA Job Title
	(1)	(2)	(3)	(4)
<i>Estimation I</i>				
Total Asset Value at Transfer				
Tobit Coefficient	-1,726,396	-1,780,583	-1,129,145	-1,023,087
Standard Deviations	-2.60	-2.50	-3.12	-3.44
Probability Effect is Due to Chance	0.0093	0.0124	0.0018	0.0006
<i>Estimation II</i>				
Prior Year Commissions				
Tobit Coefficient	-5,281	-5,180	-3,977	-3,632
Standard Deviations	-2.86	-2.72	-4.15	-5.17
Probability Effect is Due to Chance	0.0042	0.0065	0.0000334	0.000000234

Table R4c Effects of Race of Financial Advisors on Yearly Asset Values and Prior Production Credits for Accounts Transferred from Financial Advisors Departing from Merrill Lynch and House Accounts, 2001-2006 (Censored Tobit Regression Analysis) (Using Only Office Complexes with Both African American and White Financial Advisors, Adding Controls for Certifications)		
	Yearly Analysis, FAs Only	
	Controlling for Year (1)	Controlling for Year and Experience (2)
<i>Estimation I</i>		
Total Asset Value at Transfer		
Tobit Coefficient	-1,176,885	-1,150,006
Standard Deviations	-2.48	-2.37
Probability Effect is Due to Chance	0.0131	0.0178
<i>Estimation II</i>		
Prior Year Commissions		
Tobit Coefficient	-4,976	-4,721
Standard Deviations	-2.83	-2.67
Probability Effect is Due to Chance	0.0047	0.0076

Table R5a
Average Asset Values of Total Accounts Transferred to POAs
By Month of Participation, 2001-2006
(Removes POAs Not Reaching MLOS and All Transfers to Self,
Only Includes POAs in Office Complexes with Both African American and
White POAs)

Month in POA Program	White POAs	African American POAs	Standard Deviations	Probability Difference is Due to Chance
(1)	(2)	(3)	(4)	
0	\$553,142	\$163,843	-7.22	0.00000000000006
1	\$577,125	\$255,914	-2.75	0.006
2	\$344,354	\$205,229	-2.95	0.0033
3	\$294,636	\$138,284	-4.60	0.000005
4	\$308,414	\$192,421	-2.53	0.012
5	\$272,415	\$194,064	-1.71	0.088
6	\$310,921	\$192,049	-3.46	0.0006
7	\$272,365	\$199,006	-1.77	0.078
8	\$307,698	\$157,508	-4.82	0.000002
9	\$350,339	\$115,845	-5.09	0.0000004
10	\$441,361	\$222,959	-3.23	0.0013
11	\$294,461	\$278,082	-0.23	0.8203
12	\$474,484	\$344,438	-1.70	0.0911
13	\$681,360	\$316,297	-1.29	0.1981
14	\$739,601	\$141,732	-1.96	0.0506
15	\$406,136	\$468,087	0.37	0.7151
16	\$491,219	\$367,371	-0.83	0.4082
17	\$405,732	\$323,280	-0.80	0.4257
18	\$463,974	\$264,872	-2.44	0.0155
19	\$501,549	\$271,308	-2.11	0.0368
20	\$469,769	\$211,635	-4.08	0.0001
21	\$437,592	\$250,839	-2.15	0.0335
22	\$500,893	\$215,516	-2.37	0.0179
23	\$478,366	\$183,820	-3.93	0.0001
24	\$647,650	\$310,717	-2.47	0.0146
25	\$600,348	\$626,400	0.07	0.946
26	\$626,919	\$100,048	-3.28	0.0012
27	\$347,260	\$211,148	-0.78	0.4441

Table R5b Average Asset Values of Total Accounts Transferred to POAs By Month of Participation, 2001-2006 (Removes POAs Not Reaching MLOS and All Transfers to Self, Only Includes POAs in Offices with Both African American and White POAs)				
Month in POA Program	White POAs	African American POAs	Standard Deviations	Probability Difference is Due to Chance
	(1)	(2)	(3)	(4)
0	\$490,033	\$163,843	-6.10	0.0000000012
1	\$457,040	\$255,914	-2.51	0.0123
2	\$292,861	\$205,229	-1.75	0.0809
3	\$249,409	\$138,284	-3.19	0.0015
4	\$310,336	\$192,421	-2.30	0.0218
5	\$221,071	\$194,064	-0.62	0.5326
6	\$263,115	\$192,049	-2.02	0.0433
7	\$262,463	\$199,006	-1.50	0.1338
8	\$282,855	\$157,508	-3.43	0.0006
9	\$330,376	\$115,845	-4.20	0.00003
10	\$445,679	\$222,959	-2.58	0.01002
11	\$243,258	\$278,082	0.48	0.6317
12	\$438,606	\$344,438	-1.15	0.2509
13	\$401,933	\$316,297	-0.95	0.3439
14	\$948,249	\$141,732	-1.51	0.1307
15	\$381,397	\$468,087	0.50	0.6163
16	\$566,314	\$367,371	-0.93	0.3521
17	\$406,052	\$323,280	-0.79	0.4329
18	\$473,051	\$264,872	-2.31	0.0219
19	\$532,306	\$271,308	-2.34	0.0208
20	\$421,790	\$211,635	-3.15	0.0018
21	\$342,200	\$250,839	-1.04	0.3008
22	\$546,899	\$215,516	-1.78	0.0752
23	\$400,733	\$183,820	-2.80	0.0056
24	\$641,549	\$310,717	-2.11	0.0358
25	\$582,264	\$626,400	0.11	0.9103
26	\$521,536	\$100,048	-2.63	0.0094
27	\$401,081	\$211,148	-0.96	0.3445

Table R5c Average Asset Values of Total Accounts Transferred to POAs By Month of Participation, 2001-2006 (Removes POAs Not Reaching MLOS and All Transfers to Self, Only Includes POAs in Office Complexes with Both African American and White POAs, Using Bootstrapped Measures of Statistical Significance)				
Month in POA Program	White POAs	African American POAs	Standard Deviations	Probability Difference is Due to Chance
	(1)	(2)	(3)	(4)
0	\$553,142	\$163,843	-8.36	0.00000000000000006
1	\$577,125	\$255,914	-2.67	0.0075
2	\$344,354	\$205,229	-3.09	0.002
3	\$294,636	\$138,284	-4.79	0.000002
4	\$308,414	\$192,421	-2.51	0.012
5	\$272,415	\$194,064	-1.78	0.075
6	\$310,921	\$192,049	-3.37	0.0008
7	\$272,365	\$199,006	-1.70	0.0890
8	\$307,698	\$157,508	-4.68	0.0000029
9	\$350,339	\$115,845	-5.30	0.000000113
10	\$441,361	\$222,959	-3.32	0.0009
11	\$294,461	\$278,082	-0.22	0.8273
12	\$474,484	\$344,438	-1.75	0.0808
13	\$681,360	\$316,297	-1.26	0.2086
14	\$739,601	\$141,732	-1.95	0.0507
15	\$406,136	\$468,087	0.33	0.7408
16	\$491,219	\$367,371	-0.83	0.4089
17	\$405,732	\$323,280	-0.84	0.401
18	\$463,974	\$264,872	-2.85	0.0044
19	\$501,549	\$271,308	-2.17	0.0297
20	\$469,769	\$211,635	-4.16	0.00003
21	\$437,592	\$250,839	-2.20	0.0276
22	\$500,893	\$215,516	-2.39	0.0167
23	\$478,366	\$183,820	-4.13	0.00004
24	\$647,650	\$310,717	-2.36	0.0182
25	\$600,348	\$626,400	0.07	0.9464
26	\$626,919	\$100,048	-3.10	0.002
27	\$347,260	\$211,148	-0.80	0.4251

Table R6

**Effects of Race of Financial Advisors on Increases in Asset Values Under Management,
Due to Increases in Shares of Teams or Pools, for Financial Advisors Who Increased Their Shares,
between Beginning and End of Each Year, 2001-2006
Controlling for Year and Length of Service and Clustering on FA Identification Number
(Censored Tobit Regression Analysis)**

	Pools 2001-2006	Teams 2003-2006
Tobit Coefficient on African American	-137,000,000	-39,600,000
Standard Deviations	-2.07	-3.82
Probability Effect is Due to Chance	0.0385	0.000134

Table R7 Effects of Race of Clients (Using Dr. Saad's Race Assignments to Clients) on Accounts Transferred to African American and White POAs in the First 3 Months of the POA Program		
	White POAs	African American POAs
Total Transferred Account Assets	\$1,057,769	\$579,503
Total Assets Estimated to Come from African American Clients	\$67,892	\$65,699
Percentage of Assets Estimated from Probable African American Clients	7.0%	13.1%
Probability That Racial Differences in Percentages Is Due to Chance	0.0005	
Standard Deviations of Racial Differences in Percentages	3.57	

Attachment A

Dr. Saad's Support for Exhibits 21-22

```
-----
log:
F:\casework\WGM2400\Programs\Analysis\Compensation\Productivity_Regressions.log
```

```
log type: text
```

```
opened on: 14 Nov 2008, 09:43:26
```

```
. use Emp_Comp, clear
```

```
. tab year race, freq row
```

```
+-----+
| Key      |
|-----|
| frequency|
| row percentage|
+-----+
```

year	RACE		Total
	B	W	
2000	0	1	1
	0.00	100.00	100.00
2001	2	39	41
	4.88	95.12	100.00
2002	18	431	449
	4.01	95.99	100.00
2003	33	720	753
	4.38	95.62	100.00

2004		33	1,007		1,040
		3.17	96.83		100.00
-----+-----+-----					
2005		36	1,172		1,208
		2.98	97.02		100.00
-----+-----+-----					
2006		42	1,349		1,391
		3.02	96.98		100.00
-----+-----+-----					
Total		164	4,719		4,883
		3.36	96.64		100.00

```

.
. keep if year>2001
(42 observations deleted)

. *excluded because very small population in 2001;
.
. sort year race

.
.
. *running with robust SE
.
. by year: regr ln_pay2 black los_qy, robust

```

```

-----
-----
-> year = 2002

```

Linear regression

Number of obs = 449

F(2, 446) = 8.31
 Prob > F = 0.0003
 R-squared = 0.0447
 Root MSE = .4893

		Robust				
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
black	-.3107748	.1203477	-2.58	0.010	-.5472937	-.0742558
los_qy	-.1545065	.048716	-3.17	0.002	-.250248	-.058765
_cons	11.33848	.1026749	110.43	0.000	11.1367	11.54027

-> year = 2003

Linear regression

Number of obs = 753
 F(2, 750) = 6.47
 Prob > F = 0.0016
 R-squared = 0.0187
 Root MSE = .50764

		Robust				
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
black	-.3247161	.0936934	-3.47	0.001	-.5086486	-.1407835
los_qy	-.0272102	.0307458	-0.89	0.376	-.0875682	.0331477
_cons	11.15128	.0827805	134.71	0.000	10.98877	11.31379

-> year = 2004

Linear regression

Number of obs = 1040
F(2, 1037) = 14.72
Prob > F = 0.0000
R-squared = 0.0169
Root MSE = .53118

|
| Robust
ln_pay2 | Coef. Std. Err. t P>|t| [95% Conf. Interval]
-----+-----
black | -.3924259 .0728755 -5.38 0.000 -.5354263 -.2494256
los_qy | -.0086644 .022028 -0.39 0.694 -.0518889 .03456
_cons | 11.32908 .0713498 158.78 0.000 11.18907 11.46909

-> year = 2005

Linear regression

Number of obs = 1208
F(2, 1205) = 22.19
Prob > F = 0.0000
R-squared = 0.0305
Root MSE = .54541

|
| Robust
ln_pay2 | Coef. Std. Err. t P>|t| [95% Conf. Interval]

```

-----+-----
      black |  -.5207314   .0846595   -6.15   0.000   -.6868278   -.3546349
      los_qy |   .0363369   .0130638    2.78   0.005   .0107066   .0619671
      _cons |  11.29634   .0498234  226.73   0.000   11.19859   11.39409
-----+-----

```

```

-> year = 2006

```

Linear regression

```

Number of obs =   1391
F( 2, 1388) =   65.43
Prob > F      =   0.0000
R-squared     =   0.0768
Root MSE     =   .58512

```

```

-----+-----
      |               Robust
      |   Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----+-----
      black |  -.5540876   .0812568   -6.82   0.000   -.713487   -.3946882
      los_qy |   .0946198   .0098388    9.62   0.000   .0753191   .1139204
      _cons |  11.15905   .0428984  260.13   0.000   11.0749   11.2432
-----+-----

```

```

. by year: ivreg ln_pay2 black los_qy (ln_pc=ln_sg_pc), robust first

```

```

-> year = 2002

```

First-stage regressions

Source	SS	df	MS	Number of obs =	449
-----+-----				F(3, 445) =	51.91
Model	28.7399546	3	9.57998487	Prob > F	= 0.0000
Residual	82.1250517	445	.184550678	R-squared	= 0.2592
-----+-----				Adj R-squared =	0.2542
Total	110.865006	448	.247466532	Root MSE	= .42959

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
black	-.272742	.103915	-2.62	0.009	-.4769672	-.0685168
los_qy	-.1269289	.0380365	-3.34	0.001	-.2016824	-.0521753
ln_sg_pc	.2403831	.0204399	11.76	0.000	.2002124	.2805539
_cons	10.13625	.181343	55.90	0.000	9.779856	10.49265

Instrumental variables (2SLS) regression

Number of obs = 449
F(3, 445) = 60.52
Prob > F = 0.0000
R-squared = 0.7641
Root MSE = .24344

	Robust					
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	.7890471	.1105475	7.14	0.000	.571787	1.006307
black	-.0053919	.0943669	-0.06	0.954	-.190852	.1800682
los_qy	-.1047158	.0284765	-3.68	0.000	-.1606808	-.0487507

_cons		1.837453	1.35625	1.35	0.176	-.8279988	4.502904
-------	--	----------	---------	------	-------	-----------	----------

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc

-> year = 2003

First-stage regressions

Source		SS	df	MS		Number of obs =	753
-----+							
Model		61.5998941	3	20.533298		F(3, 749) =	84.41
Residual		182.206452	749	.243266291		Prob > F =	0.0000
-----+							
Total		243.806346	752	.324210567		R-squared =	0.2527
-----+							
						Adj R-squared =	0.2497
						Root MSE =	.49322

ln_pc		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+							
black		-.1437816	.0896141	-1.60	0.109	-.3197063	.0321431
los_qy		.0600855	.0275372	2.18	0.029	.0060262	.1141449
ln_sg_pc		.2711125	.0183175	14.80	0.000	.2351527	.3070722
_cons		9.50087	.1689192	56.25	0.000	9.169258	9.832481

Instrumental variables (2SLS) regression

Number of obs = 753

F(3, 749) = 215.05

Prob > F = 0.0000
 R-squared = 0.7057
 Root MSE = .27818

	Robust					
ln_pay2	Coef.	std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	.8679621	.0584338	14.85	0.000	.7532486	.9826756
black	.0202067	.0516838	0.39	0.696	-.0812557	.1216691
los_qy	-.1214349	.0176888	-6.87	0.000	-.1561605	-.0867093
_cons	.954961	.7384443	1.29	0.196	-.4947057	2.404628

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc

-> year = 2004

First-stage regressions

Source	SS	df	MS	Number of obs = 1040	
-----+-----				F(3, 1036) = 115.53	
Model	64.9370425	3	21.6456808	Prob > F	= 0.0000
Residual	194.110446	1036	.187365295	R-squared	= 0.2507
-----+-----				Adj R-squared	= 0.2485
Total	259.047488	1039	.249323858	Root MSE	= .43286

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
black	-.2877417	.0770056	-3.74	0.000	-.4388465	-.1366369
los_qy	.0313974	.0158103	1.99	0.047	.0003734	.0624213
ln_sg_pc	.2450756	.0141394	17.33	0.000	.2173305	.2728206
_cons	9.957379	.1317891	75.56	0.000	9.698775	10.21598

Instrumental variables (2SLS) regression

Number of obs = 1040

F(3, 1036) = 475.61

Prob > F = 0.0000

R-squared = 0.8844

Root MSE = .18223

	Robust					
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ln_pc	1.011008	.0267955	37.73	0.000	.9584281	1.063587
black	.0275836	.0414115	0.67	0.506	-.0536764	.1088436
los_qy	-.0773368	.0089463	-8.64	0.000	-.0948917	-.059782
_cons	-.8630826	.3239644	-2.66	0.008	-1.498784	-.2273814

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc

-> year = 2005

First-stage regressions

Source	SS	df	MS	Number of obs =	1208
-----+-----				F(3, 1204) =	164.06
Model	116.849359	3	38.9497865	Prob > F =	0.0000
Residual	285.843322	1204	.237411397	R-squared =	0.2902
-----+-----				Adj R-squared =	0.2884
Total	402.692681	1207	.333631053	Root MSE =	.48725

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
black	-.3971567	.0828986	-4.79	0.000	-.5597984	-.2345149
los_qy	.0452037	.0122705	3.68	0.000	.0211299	.0692776
ln_sg_pc	.3206795	.0161889	19.81	0.000	.288918	.3524411
_cons	9.269428	.1476231	62.79	0.000	8.979801	9.559055

Instrumental variables (2SLS) regression

Number of obs = 1208
F(3, 1204) = 140.09
Prob > F = 0.0000
R-squared = 0.6650
Root MSE = .32076

	Robust					
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	.962646	.0585147	16.45	0.000	.8478439	1.077448
black	.0154351	.0530654	0.29	0.771	-.0886759	.1195461

los_qy		-.0519405	.0077141	-6.73	0.000	-.0670751	-.0368059
_cons		-.2978274	.7167903	-0.42	0.678	-1.704124	1.108469

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc

-> year = 2006

First-stage regressions

Source		SS	df	MS	Number of obs =	1391
-----+-----						
Model		189.865827	3	63.2886092	F(3, 1387) =	347.38
Residual		252.691902	1387	.182185942	Prob > F =	0.0000
-----+-----						
Total		442.557729	1390	.318386855	R-squared =	0.4290
-----+-----						
					Adj R-squared =	0.4278
					Root MSE =	.42683

ln_pc		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
-----+-----						
black		-.3452785	.067245	-5.13	0.000	-.4771913 -.2133656
los_qy		.0531399	.0079151	6.71	0.000	.037613 .0686668
ln_sg_pc		.3979556	.0146659	27.13	0.000	.3691859 .4267253
_cons		8.513137	.1316505	64.66	0.000	8.254881 8.771392

Instrumental variables (2SLS) regression

Number of obs = 1391

F(3, 1387) = 885.04
 Prob > F = 0.0000
 R-squared = 0.8971
 Root MSE = .19544

		Robust				
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	1.033992	.0257775	40.11	0.000	.9834248	1.084559
black	-.0264596	.038736	-0.68	0.495	-.1024472	.0495279
los_qy	-.0305155	.0047605	-6.41	0.000	-.039854	-.021177
_cons	-1.220731	.3091723	-3.95	0.000	-1.827227	-.614235

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc

. by year: ivreg ln_pay2 black los_qy (ln_pc=ln_sg_pc_3), robust first

-> year = 2002

First-stage regressions

Source	SS	df	MS	Number of obs	=
-----+-----				F(3, 445)	=
Model	4.76140084	3	1.58713361	Prob > F	= 0.0002
Residual	106.103605	445	.238435068	R-squared	= 0.0429
-----+-----				Adj R-squared	= 0.0365

Total | 110.865006 448 .247466532 Root MSE = .4883

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
black	-.3568647	.1181925	-3.02	0.003	-.5891495	-.12458
los_qy	-.020079	.0460059	-0.44	0.663	-.1104949	.0703368
ln_sg_pc_3	.0164773	.0064701	2.55	0.011	.0037616	.029193
_cons	11.90333	.1073296	110.90	0.000	11.69239	12.11427

Instrumental variables (2SLS) regression

Number of obs = 449

F(3, 445) = 25.02

Prob > F = 0.0000

R-squared = 0.6490

Root MSE = .29691

ln_pay2	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
ln_pc	1.222278	.2621626	4.66	0.000	.7070477	1.737509
black	.1622805	.1548377	1.05	0.295	-.1420234	.4665844
los_qy	-.0773778	.040156	-1.93	0.055	-.1562968	.0015411
_cons	-3.379148	3.175059	-1.06	0.288	-9.619121	2.860826

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc_3

-> year = 2003

First-stage regressions

Source	SS	df	MS	Number of obs =	753
Model	10.3723898	3	3.45746325	F(3, 749) =	11.09
Residual	233.433957	749	.311660823	Prob > F =	0.0000
				R-squared =	0.0425
				Adj R-squared =	0.0387
Total	243.806346	752	.324210567	Root MSE =	.55827

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
black	-.3928961	.0995762	-3.95	0.000	-.5883777	-.1974145
los_qy	.1401351	.0332925	4.21	0.000	.0747773	.2054928
ln_sg_pc_3	.0149838	.005824	2.57	0.010	.0035505	.0264172
_cons	11.59455	.1028116	112.77	0.000	11.39271	11.79638

Instrumental variables (2SLS) regression

Number of obs = 753
 F(3, 749) = 20.44
 Prob > F = 0.0000
 R-squared = 0.6720
 Root MSE = .29368

| Robust

ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	.9619506	.2769849	3.47	0.001	.4181915	1.50571
black	.0575572	.1203184	0.48	0.633	-.1786442	.2937585
los_qy	-.1316381	.0250453	-5.26	0.000	-.1808056	-.0824707
_cons	-.1491616	3.294981	-0.05	0.964	-6.617659	6.319336

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc_3

-> year = 2004

First-stage regressions

Source	SS	df	MS	Number of obs =	1040
-----+-----				F(3, 1036) =	18.58
Model	13.2246833	3	4.40822775	Prob > F	= 0.0000
Residual	245.822805	1036	.2372807	R-squared	= 0.0511
-----+-----				Adj R-squared =	0.0483
Total	259.047488	1039	.249323858	Root MSE	= .48711

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
black	-.3967794	.0863651	-4.59	0.000	-.56625	-.2273089
los_qy	.0883023	.0182335	4.84	0.000	.0525234	.1240811
ln_sg_pc_3	.02036	.0046356	4.39	0.000	.0112638	.0294562
_cons	11.89743	.068774	172.99	0.000	11.76248	12.03238

Instrumental variables (2SLS) regression

Number of obs = 1040

F(3, 1036) = 64.40

Prob > F = 0.0000

R-squared = 0.8581

Root MSE = .20189

		Robust				
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
ln_pc	.8386415	.0993272	8.44	0.000	.6437362	1.033547
black	-.0440236	.0560731	-0.79	0.433	-.1540533	.0660062
los_qy	-.0656289	.0127133	-5.16	0.000	-.0905756	-.0406822
_cons	1.215552	1.193694	1.02	0.309	-1.126782	3.557886

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc_3

-> year = 2005

First-stage regressions

Source	SS	df	MS	Number of obs =	1208
-----+-----					
Model	29.7212105	3	9.90707018	F(3, 1204) =	31.98
				Prob > F =	0.0000

Residual		372.971471	1204	.309776969	R-squared	=	0.0738
-----+-----							
Total		402.692681	1207	.333631053	Adj R-squared	=	0.0715
					Root MSE	=	.55658

ln_pc		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----							
black		-.5331594	.0943986	-5.65	0.000	-.7183635	-.3479554
los_qy		.1000303	.0138864	7.20	0.000	.0727861	.1272745
ln_sg_pc_3		.0217504	.0049307	4.41	0.000	.0120766	.0314241
_cons		11.90792	.0615392	193.50	0.000	11.78719	12.02866

Instrumental variables (2SLS) regression	Number of obs	=	1208
	F(3, 1204)	=	60.66
	Prob > F	=	0.0000
	R-squared	=	0.6273
	Root MSE	=	.33833

		Robust					
ln_pay2		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----							
ln_pc		1.052496	.1589903	6.62	0.000	.7405675	1.364425
black		.0654792	.1045687	0.63	0.531	-.139678	.2706363
los_qy		-.06018	.0127776	-4.71	0.000	-.0852488	-.0351112
_cons		-1.37999	1.935101	-0.71	0.476	-5.176534	2.416554

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc_3

-> year = 2006

First-stage regressions

Source	SS	df	MS	Number of obs =	1391
-----+-----					
Model	62.3280249	3	20.7760083	F(3, 1387) =	75.79
Residual	380.229704	1387	.274138215	Prob > F =	0.0000
-----+-----					
Total	442.557729	1390	.318386855	R-squared =	0.1408
				Adj R-squared =	0.1390
				Root MSE =	.52358

ln_pc	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----+-----						
black	-.4859232	.0822991	-5.90	0.000	-.6473674	-.3244791
los_qy	.1261021	.0092695	13.60	0.000	.1079184	.1442859
ln_sg_pc_3	.0217463	.0044302	4.91	0.000	.0130557	.0304369
_cons	11.84446	.0479836	246.84	0.000	11.75033	11.93859

Instrumental variables (2SLS) regression

Number of obs = 1391
F(3, 1387) = 386.17
Prob > F = 0.0000
R-squared = 0.8971
Root MSE = .19542

		Robust				
ln_pay2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ln_pc	1.035373	.073546	14.08	0.000	.8910997	1.179646
black	-.0257549	.0524605	-0.49	0.624	-.1286654	.0771556
los_qy	-.0306826	.0093944	-3.27	0.001	-.0491113	-.0122539
_cons	-1.237266	.8818468	-1.40	0.161	-2.967164	.4926311

Instrumented: ln_pc

Instruments: black los_qy ln_sg_pc_3

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end of do-file

. exit, clear