

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS  
BOSTON DIVISION**

STUDENTS FOR FAIR ADMISSIONS, INC.,

*Plaintiff,*

v.

PRESIDENT AND FELLOWS OF  
HARVARD COLLEGE,

*Defendant.*

Civil Action No. 14-14176 (ADB)

**BRIEF OF ECONOMISTS MICHAEL P. KEANE, HANMING FANG,  
YINGYAO HU, GLENN C. LOURY, AND MATTHEW S. SHUM  
AS *AMICI CURIAE* IN SUPPORT OF STUDENTS FOR FAIR ADMISSIONS**

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### **INTEREST OF *AMICI CURIAE*<sup>1</sup>**

*Amici*—Dr. Michael P. Keane of the University of New South Wales; Dr. Hanming Fang of the University of Pennsylvania; Dr. Yingyao Hu of Johns Hopkins University; Dr. Glenn C. Loury of Brown University; and Dr. Matthew S. Shum of the California Institute of Technology—are leading economists and econometrics scholars who have extensively studied and written about discrete choice modeling and econometrics tools of the kind used by the experts in this case and are professionally interested in the proper use of such tools. *Amici* are of the view that the statistical model used by the plaintiff’s expert in this case is methodologically sound. Biographies of *amici* are summarized in Exhibit A to this brief.

### **INTRODUCTION AND SUMMARY OF ARGUMENT**

*Amici* write to address three central statistical issues.

*First*, Harvard’s Office of Admissions consistently rates competitive Asian-American applicants as having lower “personal ratings.” Students for Fair Admissions (SFFA) argues that these rating scores are biased against Asian Americans. Harvard disputes this claim, speculating that unknown, unobservable data could perhaps explain the remarkable racial disparity in the scores. Our

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<sup>1</sup> Counsel for *amici curiae* state that (1) this brief was authored by counsel for *amici curiae* and not by counsel for any party, in whole or in part; (2) no party or counsel for any party contributed money that was intended to fund preparing or submitting the brief; and (3) apart from *amici curiae* and their counsel, no person contributed money that was intended to fund preparing or submitting the brief. Institutional affiliations of *amici* are provided for identification purposes only.

review of the publicly available expert reports supplied by the parties' experts—Dr. Peter Arcidiacono, for the plaintiff, and Dr. David Card, for the defendant—leads us to agree with Dr. Arcidiacono's conclusion that the personal rating is biased. The disparity is striking. For example, Asian-American applicants in the top academic decile are less likely to receive a high personal-rating score than white applicants in the top 50%. This remarkable racial disparity does not appear in the personal ratings given by alumni who actually interview applicants. Dr. Card offers no plausible, non-discriminatory explanation for this stark disparity.

*Second*, Dr. Card argues that SFFA should have ignored racial disparities in how Harvard treats students whom it designates as socio-economically “disadvantaged.” This argument is unpersuasive. In seeking to explain the effect of race in admissions, it makes sense to account for how Harvard treats “disadvantaged” applicants of different races. Failing to account for this disparate treatment would obscure the magnitude of Harvard's bias against Asian Americans.

*Third*, Dr. Card argues that it was unreasonable to exclude applicants in special recruiting categories—recruited athletes, “legacy” applicants, specially selected “Dean's List or Director's List” applicants, and children of Harvard faculty and staff—from consideration in Dr. Arcidiacono's preferred model. We disagree. The special-category applicants receive personalized attention from Harvard that is not afforded to others. The unusual treatment afforded to these individuals provides

a reasonable justification for excluding them from the model.<sup>2</sup>

## ARGUMENT

### I. HARVARD'S PERSONAL-RATING SCORES ARE SIGNIFICANTLY BIASED AGAINST ASIAN AMERICANS.

#### A. Dr. Arcidiacono persuasively shows that Harvard's personal-rating scores are biased against Asian Americans.

To support its argument that Harvard discriminates against Asian Americans in the admissions process, SFFA relies on a logistic regression model by Professor Peter Arcidiacono, based on his review of six years of admissions data. *See* Expert Report of Peter S. Arcidiacono, Doc. 415-1, Ex. A (Arcidiacono Report). To ascertain the effect of race on admissions, the model controls for applicant characteristics correlated with Harvard's admission decisions, including academic performance, extracurricular activity, teacher and school-counselor recommendations, and alumni-interview ratings. *See id.* at 62 (Model 5). Using his model, Dr. Arcidiacono finds clear evidence of bias against Asian Americans. *See id.* at 65. His methodology and findings are sound.

Importantly, Dr. Arcidiacono's preferred model excludes Harvard's "personal rating" because, he argues, the personal-rating scores are tainted with racial bias

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<sup>2</sup> *Amici* also agree that it was reasonable for Dr. Arcidiacono to pool data for all six years together, instead of annually. This brief does not further address that issue, which seems to make little difference to the result.

against Asian Americans.<sup>3</sup> This is sound. If these scores are biased, then a model that controls for such scores would mask the true effect of race on admission decisions. *Id.* at 19. As Harvard’s expert, Professor David Card, concedes, “it is a well-accepted practice to exclude variables from a regression model that may themselves be directly influenced by the variable of interest (here, race).” Report of David Card, Doc. 419-33, Ex. 33 at 10 (Card Report).

This issue is critical. The inclusion or exclusion of the personal rating has the largest effect of any modeling decision on the estimated degree of discrimination against Asian-American applicants. Rebuttal Report of David Card, Doc. 419-37, Ex. 37 at 55, Ex. 13 (Card Rebuttal). If the personal rating is biased, then all of the sensitivity analyses performed by Dr. Card to confirm that there is no evidence of discrimination are invalid, for they all include the personal rating. *Id.* at 53–64.

Dr. Arcidiacono examines whether non-racial factors can explain Asian Americans’ lower personal-rating scores. He reasonably concludes that they cannot. *See* Arcidiacono Report 55. If Harvard treated Asian Americans as it treats whites, his model predicts that Asian-American applicants’ probability of receiving a high personal score “would have increased by over three percentage points, reflecting a

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<sup>3</sup> It appears that Harvard provides no objective standards for how to determine this opaque rating. Arcidiacono Report 37–38. Admissions officers have testified that they seek applicants with a “positive personality,” including “character traits” such as “likeability, helpfulness, courage and kindness” and whether the applicant is an “attractive person to be with,” is “widely respected,” is a “good person,” and has good “human qualities.” *See* SFFA SMF, Doc. 414 ¶ 90; Harvard SMF, Doc. 420 ¶ 60.



20% increase[d] chance of receiving a 2 or better.” *Id.* at 57; *see id.* at 5, 20, 36, 38 (further discussing significance of rating scale of 1 to 6 (lowest being best)).

Several highly suspect patterns in the observed data support the conclusion that Harvard’s personal-rating scores are biased against Asian Americans.

*First*, Asian-American applicants to Harvard are highly competitive relative to other applicants in *all* observable academic and non-academic measures that affect admission decisions *except* Harvard’s personal rating. On the whole, Asian-American applicants clearly outperform other applicants in the academic measures. Arcidiacono Report 36–37. As to non-academic measures, Asian Americans have scores similar to whites’ scores, and generally higher than African Americans’ and Hispanics’ scores, with two exceptions: the athletic rating (which is not correlated with a significantly increased chance of admission outside the special category of recruited athletes) and the personal rating. *Id.* at 37; *see* Rebuttal Expert Report of Peter S. Arcidiacono, Doc. 415-2, Ex. B at 29, Table 3.1N (Arcidiacono Rebuttal).

*Second*, applicants with stronger academic ratings tend to have higher non-academic ratings across all dimensions, regardless of race. Arcidiacono Report 47–48. But for the personal rating, this correlation is exceptionally weak for Asian-American applicants. Inexplicably, the *most* academically competitive Asian Americans do much worse in Harvard’s personal-rating score than do academically similar applicants of other races. *Id.* at 49–50. As is shown in Figure 1 below, Asian-American applicants in *the very top* academic decile (the top 10%) are less likely to receive a good personal-rating score (2 or lower, lowest being best) than whites in

the *top five* deciles (the top 50%), Hispanics in the *top six* deciles (the top 60%), and African Americans in the *top eight* deciles (the top 80%). This striking pattern is not replicated in other measures used by the Office of Admissions: the academic rating, extracurricular rating, alumni personal rating, teacher letter scores, and high-school counselor scores. In other words, personal-rating scores make the top-performing Asian-American applicants *less* competitive while making other top-performing applicants *more* competitive. This matters, because only applicants that have a 2 or better on both the personal-rating and the academic-rating scores are likely to gain admission. Arcidiacono Report App’x A Table A.8.

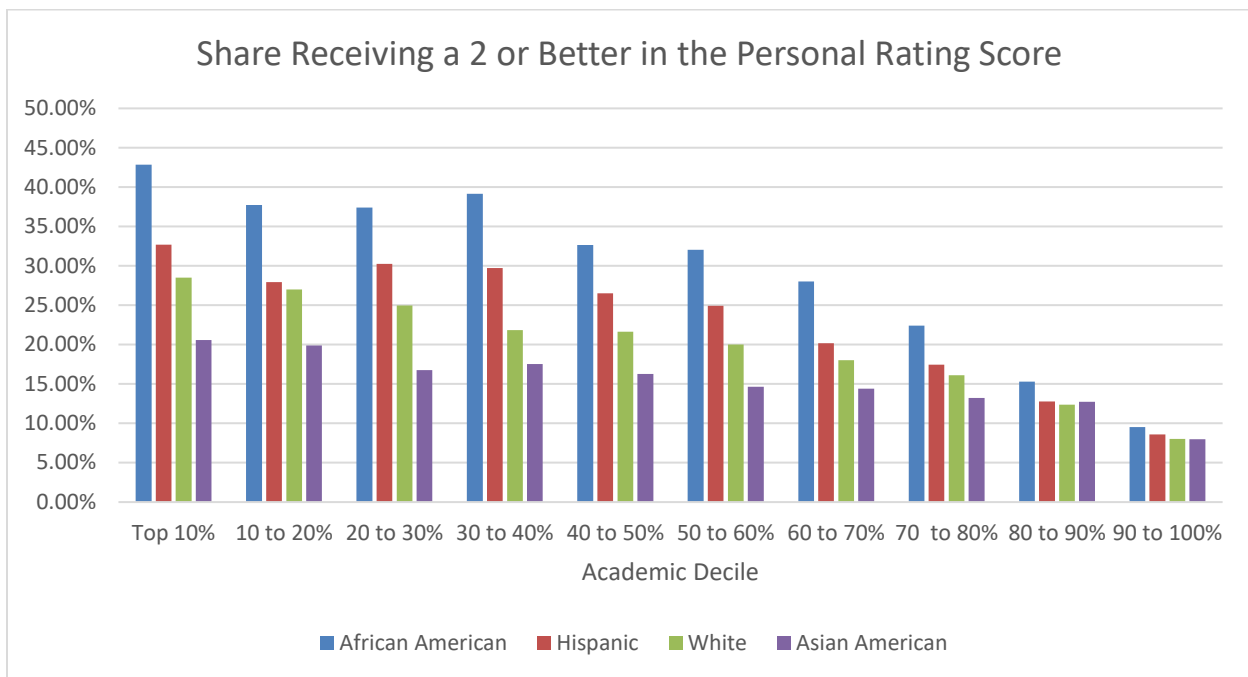


Figure 1: Data Taken from Arcidiacono Report 49, Table 5.6

Relatedly, the personal-rating scores are suspiciously sorted by race. “In every academic decile, African Americans have the highest share [of applicants] scoring a 2 or better on the personal rating, followed by Hispanics, then whites, then Asian

Americans.” *Id.* at 49 (emphasis added).<sup>4</sup> This racial pattern—not present for other ratings—strongly suggests that Harvard puts significant weight on race in assigning personal ratings.

*Third*, this disparity does not appear in the separate personal ratings given by alumni who interview Asian-American applicants. Notably, Admissions Office staff—unlike alumni—meet with only a very small fraction of applicants.<sup>5</sup> Although there is also “some racial disparity in the alumni personal rating, it is less than half of the disparity” in the Harvard personal rating. Arcidiacono Report 50. In sum, the evidence strongly suggests that the Harvard personal ratings are racially biased.

**B. Dr. Card’s alternative explanation for Asian Americans’ lower personal-rating scores is unsupported and unpersuasive.**

To defend Harvard’s personal ratings against compelling evidence of bias, Dr. Card invokes the possibility of “omitted-variable bias.” Card Report 70. In essence, he speculates that something other than race could cause the apparent racial bias in these ratings. Dr. Card suggests that unspecified “missing data” that are not observed in any of the summary statistics could explain away this apparent bias. *Id.*

Dr. Card’s appeal to unknown missing data is unpersuasive. When “alternative explanations” are “less plausible than the proposed causal link,” they do not rebut an inference of causality. Federal Judicial Ctr. & Nat’l Research

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<sup>4</sup> The only exception to the pattern is shown in the “80 to 90%” decile in Figure 1 (above), in which whites do a bit worse than Asian Americans. *See id.* Table 5.6.

<sup>5</sup> Harvard staff interviews only 2.2% of all applicants, and only 1.2% of all Asian-American applicants. Arcidiacono Rebuttal 66.

Council, Reference Manual on Scientific Evidence 221 (3rd ed. 2011) (Reference Manual). Under accepted econometric practice, an objection of omitted-variable bias should be accepted only when it is shown that the missing variable (1) “is a determinant” of the outcome *and* (2) also correlates with race, “and thus is likely to cause a demonstrable, rather than an assumed, [omitted-variable] bias.” *Sobel v. Yeshiva Univ.*, 839 F.2d 18, 36 (2d Cir. 1988). Here, it is unreasonable to infer that “missing data” could be causing the racial disparities in personal-rating scores. No plausible, non-discriminatory reason explains why Harvard rates Asian-American applicants as less personally appealing than applicants in other racial groups.

**1. Dr. Card fails to identify missing data that could explain the racial disparity in the personal-rating scores.**

At first, Dr. Card asserted that the regression model finding bias in Harvard’s personal rating is “poorly fitted” (has a low “McFadden”  $R^2$  value). Card Report 69–70.<sup>6</sup> If true, this would be an important criticism. “Fit” essentially measures how well the model’s predictions explain the actual personal-rating scores. The less the model explains the actual scores, the more plausible it is that the model is ignoring an alternative explanation for the scores.

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<sup>6</sup> Generally,  $R^2$  “measures the percentage of variation in the dependent variable [the personal-rating scores] that is accounted for by all the explanatory variables.” Reference Manual 345. Typical linear models used to predict continuous outcomes (outcomes that can take any numerical value) use a standard  $R^2$  statistic. Different  $R^2$  statistics with different technical definitions can be used in logistic regression (logit) models used to predict discrete outcomes (e.g., admission vs. rejection), like the one used in this case. See Bo Hu et al., *Pseudo- $R^2$  in Logistic Regression Model*, 16 *Statistica Sinica* 847, 847–48 (2006). Good  $R^2$  values in logit models are lower than in linear models, simply because discrete outcomes are less predictable than continuous outcomes.

But this criticism is mistaken. Dr. Arcidiacono's model is an "excellent fit" by accepted academic standards. As the classic reference by the Nobel-Prize-winning econometrician Daniel McFadden explains, "values of 0.2 to 0.4" for the "McFadden"  $R^2$  statistic are considered "an excellent fit." Daniel McFadden, *Quantitative Methods for Analyzing Travel Behaviour of Individuals: Some Recent Developments* 35 n.\*\* (Nov. 22, 1977), <https://bit.ly/2JyWFCX>. The  $R^2$  value that Dr. Card claims is a "poor" fit is 0.28, well "within the range characterizing an 'excellent' fit." Arcidiacono Rebuttal 23.

Dr. Card's rebuttal report abandons his original criticism and states that Dr. Arcidiacono "misses the broader point." Card Rebuttal 20. Dr. Card's "broader point" is that "even a model that has a relatively" good fit "*may* suffer from omitted variable bias in estimating the effect of Asian-American ethnicity" on the personal ratings. *Id.* (emphasis added). This is theoretically true, but it does not advance a plausible non-discriminatory explanation for the racial disparity in scores.

In this case, context makes clear that missing data are very unlikely to be causing the disparity.<sup>7</sup> It is not apparent what other data could be missing; Dr. Card provides no plausible hypothesis as to what data could be missing. He notes that "the model is missing an assessment of the applicant's personal essay" and support letters "from figures like research supervisors or extracurricular

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<sup>7</sup> As explained in the Reference Manual on Scientific Evidence, "the inference that one makes from a particular value of  $R^2$  will depend, of necessity, on the context of the particular issues under study and the particular dataset that is being analyzed." Reference Manual 314 n.31.

instructors.” *Id.* at 21. But the suggestion that these materials could explain the racial bias in the personal-rating scores is not reasonable. It requires accepting without evidence that Asian Americans write less compelling essays than other applicants, even though Asian Americans’ verbal SAT scores are generally on par with whites’ scores and higher than the scores of applicants of other races. *See* Arcidiacono Report 33. It would require accepting without evidence that Asian Americans, who have the highest extracurricular-rating scores of any racial group, have less compelling extracurricular-instructor recommendations than other applicants. *Id.* at 36, Table 4.1. If Dr. Card “has any support for *why* Asian-American applicants have weaker personal qualities than other racial groups, he does not provide it.” Arcidiacono Rebuttal 25 n.12.

**2. Dr. Card’s claim that Asian Americans perform worse on non-academic dimensions than whites is wrong and cannot explain the racial disparity in the personal-rating scores.**

Dr. Card argues that it is plausible that unobservable omitted variables explain the observed disparity in the personal-rating scores because, he claims, Asian-American applicants tend to do worse than whites in observable non-academic dimensions. *See* Card Rebuttal 27, 30–31. Dr. Card argues that given this asserted racial disparity in non-academic ratings, “it is entirely plausible that the unexplained gap in the personal rating reflects differences in *unobservable* factors that are missing from the personal ratings regression, rather than racial bias against Asian-American applicants.” *Id.* at 27.

This argument is not persuasive. Contrary to Dr. Card’s assertion, Asian-American applicants *do better* than white applicants in the non-academic index. Arcidiacono Rebuttal 29, Table 3.1 (panel 4). Dr. Card is able to argue otherwise only because he includes applicants in certain special recruiting categories — “athletes, children of faculty and staff, applicants who are on Dean’s List or Director’s List, and legacies”— in his comparison. Card Rebuttal 30–31.<sup>8</sup> This biases the non-academic index. Special-category applicants are much more competitive in non-academic dimensions (e.g., athletic ratings) than all other applicants. And Asian Americans are significantly underrepresented in this category. Arcidiacono Report 21–22, 34 & App’x B, Table B.3.2. Including the special-category applicants in the comparison therefore creates the misleading impression that regular white applicants do better than regular Asian-American applicants, when the opposite is true. Arcidiacono Rebuttal 29, Table 3.1 (panel 4).

**3. Dr. Card fails to explain the disparity between Harvard’s personal-rating scores and alumni personal-rating scores for Asian Americans.**

Unlike Harvard’s admissions staff, Harvard alumni do not score Asian-American applicants significantly lower than non-Asian-American applicants on the

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<sup>8</sup> Dr. Card also attempts to support his argument by referencing broader “academic literature” “outside the Harvard data” that purports to show that “Asian-American high school students apply to selective universities at higher rates than students from other ethnic groups, even after controlling for whether or not a student is qualified on key academic dimensions.” *Id.* at 33. But whatever selection effects apply more generally, this cannot explain the disparity among *similarly-situated* applicants. Asian-American applicants *to Harvard* receive worse personal ratings than applicants in other groups even though they have stronger academic ratings and similar or stronger non-academic ratings.

personal rating. Dr. Card attempts to explain the disparity by pointing out that the ratings are “based on different sources.” Card Report 74. He assumes, dubiously, that the paper materials considered by Harvard are more reliable indicators of whether a person is (for example) “likeable” than in-person interviews. *Id.* But again, he never explains how personal essays could reveal a trove of “missing data” justifying the assertion that Asian Americans are less appealing than other applicants, nor does he explain how Asian Americans could manage to conceal negative personal attributes during *in-person* alumni interviews while revealing them in their carefully composed application materials. Dr. Card’s reliance on unsupported assumptions is scientifically unsound.

#### **4. Dr. Card’s claim of selective reasoning is mistaken.**

Finally, Dr. Card argues that SFFA’s expert has engaged in inappropriately selective reasoning. Asian Americans perform slightly better in Harvard’s academic and extracurricular rating scores than one would expect based on measured data (like SAT scores), and Dr. Arcidiacono suggests that this modest “gap” could be attributable to missing data. Card Rebuttal, 22. In Dr. Card’s view, if Dr. Arcidiacono is willing to draw such an inference in *favor* of Asian Americans, he must also agree that “missing data” explains the racial disparity *disfavoring* Asian Americans in the personal-rating scores. *Id.*

This argument is premised on a false dichotomy. It makes sense to infer that missing data may explain the gap *favoring* Asian Americans in the academic and extracurricular rating scores relative to their test scores, because Asian Americans



objectively outperform all other applicants in academic and extracurricular measures. Arcidiacono Rebuttal 26. It *does not* make sense to infer that missing data explains away the much starker racial disparity, *disfavoring* Asian Americans, in the subjective personal-rating scores, because no observable data justifies that inference. (African Americans, Hispanics, and whites do not significantly outperform Asian Americans in other non-academic rating scores. *See supra* at 10.) Moreover, the academic and extracurricular rating scores cannot easily be used to mask or manifest racial bias, and thus it is reasonable to infer that the gap in the academic and extracurricular ratings truly reflects missing data in the model, not manipulation or racial stereotyping.<sup>9</sup> By contrast, the personal-rating score, like similarly “subjective, standardless” rating methods used by employers, is “a convenient mechanism for discrimination.” *Boykin v. Georgia-Pacific Corp.*, 706 F.2d 1384, 1390 (5th Cir. 1983).

In sum, Dr. Card’s report does not provide any plausible explanation for the racial disparities in the personal-rating scores. Dr. Card’s decision to control for biased factors like “parents’ occupations and the disputed personal rating” is “statistically rather like saying that once you correct for racial bias, Harvard is not racially biased.” *The Economist, A Lawsuit Reveals How Peculiar Harvard’s Definition of Merit Is* (Jun. 23, 2018), <https://econ.st/2MmJeYx>.

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<sup>9</sup> For example, one can objectively verify that an applicant not only has high math SAT scores but won a math or science competition, or that she not only plays the violin in a school orchestra but plays first violin in an award-winning youth orchestra outside of school.

**II. DR. ARCIDIACONO CORRECTLY CONCLUDES THAT INTERACTIONS BETWEEN RACE AND “DISADVANTAGED” STATUS SHOULD BE INCLUDED IN HIS MODEL.**

**A. Ignoring racial disparities in Harvard’s treatment of “disadvantaged” applicants undercounts the number of Asian Americans who would be admitted absent discrimination.**

In general, “disadvantaged” applicants are more likely to gain admission to Harvard than other applicants. *See* Arcidiacono Report 34.<sup>10</sup> But for African-American applicants, “there is *no* added benefit from being disadvantaged,” *id.* at 64; for Hispanic applicants, the preference from disadvantaged status is quite modest. *Id.* This disparate treatment of disadvantaged students can reasonably be explained as follows: Harvard already gives such strong preferences to African-American and Hispanic applicants in other ratings, such as the personal and overall rating scores, that it sees no need to grant a significant additional preference to disadvantaged members of these groups. *See id.*; Arcidiacono Rebuttal 20-21.

This disparity has important technical consequences for how Harvard’s admission process should be modeled for purposes of determining the presence or absence of discrimination against Asian Americans. Ignoring the fact that African-American and Hispanic applicants get little or no admission preference from being disadvantaged “weakens the effect of disadvantage as an explanatory term.” Arcidiacono Rebuttal 20. And “because more Asian-American applicants than white applicants are disadvantaged, the weaker [perceived] effect of disadvantaged status

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<sup>10</sup> Socio-economically “disadvantaged” status is assigned by the Office of Admissions “based on information they receive about the high school, neighborhood, or other facts volunteered by the applicant.” *Id.*

in turn . . . [tends] to conceal the magnitude of discrimination against Asian-Americans.” *Id.* at 20–21. Unless the statistical model accounts for the racial disparity in Harvard’s treatment of disadvantaged applicants, the model will underestimate the rate at which Asian Americans should have been admitted (absent racial discrimination) relative to whites. *Id.* at 20. Hence, the model will underestimate the degree of discrimination against Asian Americans.

The universally accepted solution to this problem is to add an “interaction term” to the statistical model. Here, this means an additional variable that accounts for the effect of disadvantaged status in admissions as it differs by race. *See* Reference Manual 316–17.<sup>11</sup> As the Reference Manual on Scientific Evidence admonishes, “[i]t is especially important to account for interaction terms that could affect the determination of discrimination; failure to do so may lead to false conclusions concerning discrimination.” *Id.* at 317. Indeed, a failure to control for this racial disparity in the model would lead to erroneous conclusions, significantly undercounting the number of Asian Americans who would be admitted relative to whites. Dr. Arcidiacono reasonably and correctly accounts in his model for the racial disparities in how Harvard treats disadvantaged students.

**B. Dr. Card errs in arguing for ignoring racial disparities in Harvard’s treatment of “disadvantaged” applicants.**

Arguing that Dr. Arcidiacono should have ignored these racial disparities, Dr. Card states that “[s]ince there are hundreds of potential interactions one could add

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<sup>11</sup> An interaction term “is the product of two other variables that are included in the multiple regression model.” *Id.* at 316.

to the model, and it is not computationally feasible to include them all, it is unclear why” Dr. Arcidiacono chose to add this interaction. Card Report 49. Dr. Card suggests that this choice was not “guided by a clear . . . methodological goal.” *Id.* This suggestion is not persuasive.

Ignoring the effect of race on the effect of disadvantaged status would lead to erroneous predictions for the explanatory variable of interest: race. In a model that seeks to explain the effect of *race* on admissions, it is methodologically appropriate to control for *racial* disparities. Indeed, Dr. Card agrees with this principle. He acknowledges that “an interaction between race and disadvantaged status” should be added “if the effect of being disadvantaged is different for Asian-American and White applicants.” Card Report 49. But he has no explanation for why disparities should be ignored when the effect of being disadvantaged is different for African Americans and Hispanics, as compared against Asian Americans and whites. No such explanation exists. *See* Arcidiacono Rebuttal 20–21.

**III. DR. ARCIDIACONO CORRECTLY CONCLUDES THAT SPECIAL-RECRUITING-CATEGORY APPLICANTS, WHO ARE NOT SIMILARLY SITUATED TO OTHER APPLICANTS, SHOULD BE EXCLUDED FROM THE SAMPLE IN HIS MODEL.**

Dr. Arcidiacono’s preferred model is based on a sample of applicants that excludes applicants in special recruiting categories—“athletes, children of faculty and staff, applicants who are on Dean’s List or Director’s List, and legacies.” Arcidiacono Report 22. Applicants in these categories have a substantially increased chance of admission. *Id.* at 21–22, 34. The general admission rate is roughly 6%, but recruited athletes have an admission rate of 86%, legacy applicants have an

admission rate of 33.6%, and children and faculty of staff have an admission rate of 47.7%. *Id.* at 21–22.<sup>12</sup> Dr. Arcidiacono appropriately excludes these special-category applicants from the main sample to allow for a comparison of “similarly-situated candidates.” Arcidiacono Report 22.

Dr. Card disputes this sampling choice. He argues that “these applicants are not considered in a separate admission process.” Card Rebuttal 50. Thus, he claims, their exclusion is methodologically unsound, as “exclusion of this large and relatively well-qualified group of applicants from the admissions model removes important information about how Harvard balances the many characteristics it considers in its decision process, and thus, makes the model less reliable.” *Id.* at 48. This methodological dispute is not merely academic. There is no evidence of racial bias against (the relatively few) Asian Americans in the sample of special-category applicants; so excluding them, Dr. Card argues, is akin to “stacking the deck in favor of finding bias.” *Id.* at 51.

Dr. Card concedes, however, that excluding special-category applicants from the sample is methodologically appropriate if “evidence outside the data” supports the claim that Harvard is discriminating only against applicants other than special-category applicants. *Id.* Without such evidence, he claims, there is no “logical reason to assume” that discrimination is limited to applicants in the larger pool. *Id.*

Dr. Arcidiacono has the better argument on this issue.

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<sup>12</sup> These applicants constitute less than 5% of the applicant sample, but roughly one-third of admittees. Card Report App’x A, Table A.4.

*First*, under standard econometric practice, recruited applicants should be pooled together with regular applicants only if statistical tests show that the admissions process is “identical . . . for [the] two groups.” Gregory C. Chow, *Tests of Equality Between Sets of Coefficients in Two Linear Regressions*, 28 *Econometrica* 591, 591 (1960).<sup>13</sup> Dr. Card makes no attempt to meet this burden.

*Second*, there is sound evidence that Asian-American (and other) applicants in the special recruiting categories are in fact treated differently than typical applicants. For example, special-category applicants (both the Asian-American subset and the entire group) receive staff interviews at a much higher rate than other applicants. Arcidiacono Rebuttal 66–67; *see id.* at 66, Table 7.3N. The admission rate for special-category applicants is remarkably higher than the rate for other applicants, and there are relatively few Asian Americans among the special-category applicants. Arcidiacono Report 21–22, 34 & App’x B, Table B.3.2. The personalized treatment afforded special-category applicants provides a logical reason to think that Asian Americans in that group are less likely to suffer from stereotyping and implicit bias than are other Asian-American applicants, and provides a sound justification for excluding special-category applicants from the sample.

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<sup>13</sup> In linear models, one could use a “Chow test” for pooling, while in logit models one could do a likelihood ratio test.

## CONCLUSION

For the foregoing reasons, the Court should conclude (1) that Harvard's personal-rating scores are biased against Asian Americans, (2) that Dr. Arcidiacono's statistical model correctly accounts for racial disparities in how Harvard treats "disadvantaged" students, and (3) that it was reasonable to exclude applicants in special recruiting categories from the sample studied in the model.

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that this document filed through the CM/ECF system will be sent electronically to the registered participants as identified on the Notice of Electronic Filing.

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