

No. 20-1199

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In the  
**Supreme Court of the United States**

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STUDENTS FOR FAIR ADMISSIONS, INC.,

*Petitioner,*

*v.*

PRESIDENT AND FELLOWS OF HARVARD COLLEGE,

*Respondent.*

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**On Petition for a Writ of Certiorari  
to the United States Court of Appeals  
for the First Circuit**

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**BRIEF OF ECONOMISTS AS *AMICI CURIAE* IN  
SUPPORT OF PETITIONERS**

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## QUESTIONS PRESENTED

1. Should this Court overrule *Grutter* v. *Bollinger*, 539 U.S. 306 (2003), and hold that institutions of higher education cannot use race as a factor in admissions?

2. Is Harvard violating Title VI by penalizing Asian-American applicants, engaging in racial balancing, overemphasizing race, and rejecting workable race-neutral alternatives?

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

*Amici* Michael P. Keane, Hanming Fang, Christopher J. Flinn, Stefan Hoderlein, Yingyao Hu, Joseph P. Kaboski, Glenn C. Loury, Thomas A. Mroz, and Matthew S. Shum are distinguished economists who have extensively studied the kind of statistical and econometrics tools used by the experts in this case. Indeed, Harvard's statistician admitted that he assigns writings from *amicus* Dr. Keane to explain to his students the very tools used in this case. JA3232:23–3234:1. The institutional affiliations of *amici* are listed for identification purposes only in Appendix A.

*Amici* agree that the statistical evidence in this case shows that Harvard discriminates based on race in admissions.

## INTRODUCTION

For the first time, extensive discovery into Harvard's admissions process has allowed expert statisticians under the hood, so to speak, to examine the extent to which Harvard discriminates based on race. The dataset in this case is comprehensive, including hundreds of applicant characteristics for the approximately 150,000 people who applied to Harvard over six years of admissions. This extensive dataset

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<sup>1</sup> Counsel of record for all parties received notice at least 10 days prior to the due date of the *Amici Curiae's* intention to file this brief and responded with consent in writing. No party's counsel authored this brief in whole or in part, and no person or entity other than *amici* or their counsel made a monetary contribution intended to fund its preparation or submission.

allowed the parties' experts to build logistic regression models of Harvard's admissions process that control for over two hundred observable applicant characteristics. JA3152:17–18, 6010. These controls allowed the experts to determine the effect of race on admissions while holding other applicant characteristics constant.

When all relevant observable characteristics are accounted for, the models reveal that Harvard discriminates based on race. The compelling statistical record of racial discrimination makes this case an ideal vehicle to revisit the proper role of race in college admissions and clarify the scope of non-discrimination law under Title VI.

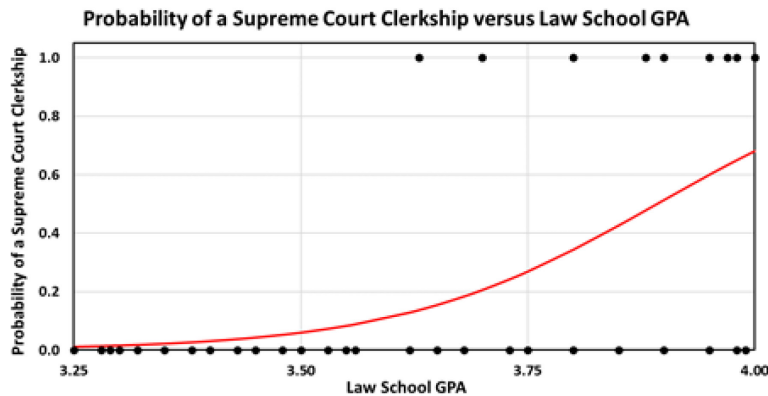
## STATEMENT

### I. Statistical Principles Relevant to the Petition

Regressions are mathematical tools used to understand associations between an outcome and an explanation. Logistic regressions are a type of regression used to determine an association between a discrete set of outcomes and a particular explanation.

For example, if one wanted to know how to land a clerkship with a Supreme Court Justice, one could begin by plotting the association between law school grades and landing a clerkship. Because the outcome is discrete, in this case binary (either one lands a clerkship or one does not), a *linear* regression is useless. Instead, the model needed is *logistic* regression, a form of regression that uses a probability function to see how grades are associated with the

likelihood of landing a clerkship. In this case, the strength of the relationship—the “coefficient”—between grades and clerkship would be positive. The higher the grades, the higher the likelihood of landing a clerkship. To illustrate:



The data points are all no clerkship (0), or clerkship (1), making a linear function impossible. Instead, a probability function is needed to measure the association of grades and the likelihood of landing a clerkship.

In the real world, of course, Justices do not consider grades alone. Rather, they consider multiple characteristics, including law-school ranking, letters of recommendation, prior clerkship experience, background, philosophy, and many other observable and unobservable factors that vary by Justice. A model that plots the likelihood of landing a clerkship based on grades alone would be nearly useless if one is interested in how the Justices pick clerks. The model would omit too much important information. A more complex model with multiple variables is needed.



Even worse, a grades-only model is likely misleading, because it would likely suffer from a form of bias called omitted variable bias. Omitted variable bias happens when two things are true at the same time. First, the omitted variable must explain part of the decision to hire clerks, the outcome. Second, the omitted variable must also be correlated with grades, the explanation. If both of those are true, then omitting the variable makes the model worse than useless—it is misleading, because grades would “be credited with an effect that actually is caused by the excluded variable.” Nat’l Research Council, Reference Manual on Scientific Evidence 314 (2011). Conversely, if either thing is not true, then there is no omitted variable bias. A model may exclude relevant explanatory variables, and yet not suffer from any bias.

For example, in our grades-only logistic model, because prior clerkship experience is associated with higher grades, and explains part of landing a Supreme Court clerkship, the model would be biased. Grades would get credit for the effect of having prior clerkship experience, so the omission of prior clerkship experience biases the model. Specifically, it would suggest an effect for grades that is too high. Conversely, however, an interest in fly fishing may affect the likelihood of landing a clerkship with a particular Justice, but if fly fishing is not correlated with grades, then the omission of fly fishing does not bias the model.

Adding variables, however, is not always better. Including some variables may make a model misleading, introducing a form of bias one could call “included variable bias.” Included variable bias

happens when the included variable is itself influenced by the variable of interest. This falsely dilutes the explanatory power or “coefficient” of the variable of interest.

For example, imagine you want to know to what extent Justice McReynolds—who was “openly anti-Semitic”<sup>2</sup>—discriminated against Jews when hiring clerks. You would not want the model to include “wearing yarmulkes” as a variable, because discriminating against yarmulkes is discriminating against Jews. See *Bray v. Alexandria Women’s Health Clinic*, 506 U.S. 263, 270 (1993). In this case, inclusion of yarmulkes in the model could make it appear as if Justice McReynolds was somewhat averse to *both* Jews and yarmulkes, showing modest negative coefficients for both. In reality, however, Justice McReynolds was just anti-Semitic. In an accurate model, the negative coefficient for Jews should be very large. But the inclusion of yarmulkes in the model obscures that fact.

Similarly, if the model instead included a variable on how Justice McReynolds rated applicants based on their “character” or “fitness” to be his clerks, those subjective assessments could easily conceal Justice McReynolds’ virulent anti-Semitism. If the statistical evidence suggests that the subjective rating is racially biased, it should not be included in the model.

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<sup>2</sup> See Ruth Bader Ginsburg, Remarks for Touro Synagogue Celebration of the 350th Anniversary of Jews in America (Aug. 22, 2004).

These statistical principles are not disputed by the parties. But the parties dispute their application to this case.

## **II. Statistical Modeling Evidence Relevant to the Petition**

As with the decision to hire a clerk, the decision to admit an applicant to Harvard is complex and multifaceted. Harvard considers an enormous quantity of information about prospective students. The experts' best admission models control for the overwhelming number of observable variables, which number over 200. JA3152:17–18. “Their admission models are broadly similar” and predict admissions based “on a wide range of observable variables,” including demographics like race and sex, geographical indicators, academic measures like SAT test scores, and Harvard’s applicant ratings. App.185; JA6010. The experts disagree only over a narrow range of modeling choices, including whether to include certain control variables. App.186.

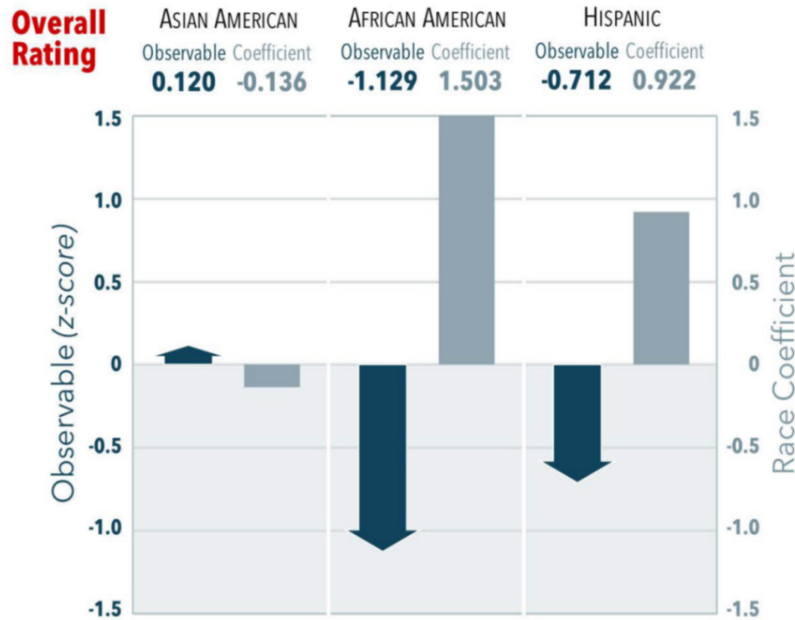
The most important modeling dispute centers on one of the “profile” ratings assigned by Harvard’s admission readers. “There are six types of ratings assigned during the reading stage: academic ratings, extracurricular ratings, athletic ratings, school support ratings, personal ratings, and overall ratings.” App.16. Profile ratings are numerical, with 1 being best and higher numbers usually being worse. App.16. Because Harvard is interested in well-rounded applicants, scoring a 1 or a 2 on multiple profile ratings is very predictive of admission. JA6037.

Two profile ratings are particularly relevant to race: the overall rating, which everyone agrees should be excluded from admissions models, and the personal rating, which the experts disagree on whether to include or exclude.

**A. Harvard admits that it discriminates in the overall rating.**

The overall rating is a subjective assessment that “takes all available information into account” to evaluate a candidate’s overall probability of admission. App.20. Harvard concedes that admission officers can and do often intentionally discriminate based on race by granting “tips” to favor African Americans and Hispanics in the overall rating. App.21, 24. Harvard “intends” that race be factored in this rating. App.196.

Harvard’s concession is compelled by the data. Petitioners’ expert developed a logistic regression to see how race correlates with the overall rating. This model shows race discrimination. In the picture below, the dark blue arrows show how a particular race would be expected to do compared to whites based on all observable data that informs the overall rating. The grey column shows the coefficient for each race—i.e., the strength of the association between a particular race and the likelihood of getting a good overall rating from Harvard, all other things being equal. JA2272:3–2273:18.



JA6015.<sup>3</sup>

Harvard's overall ratings are inexplicable without racial discrimination. The coefficients are precisely the opposite of what one would expect based on other observable data. Based on that data, Asian Americans should do better than whites on the overall rating, but they do worse. App.195–96. African Americans and Hispanics would be expected to do much worse than whites (and Asian Americans) on the overall rating, but they do much better. Indeed, the overall rating coefficient for African Americans is

<sup>3</sup> This demonstrative was developed using a “baseline” dataset that excluded athletes, legacies, dean’s list applicants, and children of faculty and staff. But the expanded dataset shows similar results. Rebuttal Expert Report of Peter S. Arcidiacono 170, Doc. 415-2, Table B.6.8R (Arcidiacono Rebuttal).

very large, indicating that the mere fact of being African American is associated with a strong probability of receiving a good overall rating because of a racial plus-factor, what Harvard calls a race-based “tip.” JA2273:7–15, 2255:25–56:10.

To illustrate the magnitude of the bias, Petitioners’ expert used these model coefficients to counterfactually isolate the “average marginal effect” of race on the overall rating: the probability of getting a good overall rating based on race, compared to an “if white” counterfactual. App.184–85; JA2258:12–2259:24. For example, the average marginal effect of Asian Americans on the overall rating is calculated by first taking every Asian American applicant in the sample and calculating two probabilities using the model coefficients: their probability of getting a good overall rating if they were Asian American and their probability of getting a good overall rating if they were white. App.185; JA2184:8–17, 2240:24–2242:12. “The difference in the two probabilities is called the marginal effect of being Asian American for that applicant.” App.95 n.43. The marginal effect can then be averaged out over all Asian American applicants. App.95 n.43.

This analysis shows that compared to whites, the increase in the probability of scoring a two or better on the overall rating for African Americans is 315%, for Hispanics it is 126%, and for Asian Americans it is -7%.

Race	No racial preference (“If White”)	Actual (“Own Race”)	Percentage increase in probability of 2 or better
White	n/a	0.047	n/a
African American	0.013	0.054	315.38%
Hispanic	0.019	0.043	126.32%
Asian American	0.056	0.052	-7.14%

Arcidiacono Rebuttal 116, Table 6.2R.

This bias is important. Only 1.5% of all applicants with an overall rating of 2 or better were rejected, while nearly 70% of applicants with less than a 2 were rejected. JA4530. Given that a good overall rating is important to gain admission, the racial bias in the overall rating alone is significant evidence of racial discrimination in admissions.

Because the overall rating contains “racial tips,” both parties’ experts agreed that the rating must be excluded from the admissions model. App.195. This logic is sound: the purpose of the admissions models is to determine the effect of race on admission to Harvard, not to perfectly predict whether a particular applicant is likely to be admitted. Including the biased overall rating artificially waters down the coefficient of the variable of interest, race. That would introduce “included variable bias” into the admissions model.

### **B. Harvard disputes that it discriminates in the personal rating.**

Harvard claims the personal rating is a subjective measure of “perceived leadership, maturity, integrity, reaction to setbacks, concern for others, self-confidence, likeability, helpfulness, courage, kindness, and whether the student is a ‘good person to be around.’” App.19. As the court of appeals

recognized, “almost any information in a student’s application can factor into the personal rating.” App.19. The personal rating is important. Over three-fourths of Harvard’s admitted applicants had a personal rating of 2 or better. JA4530.

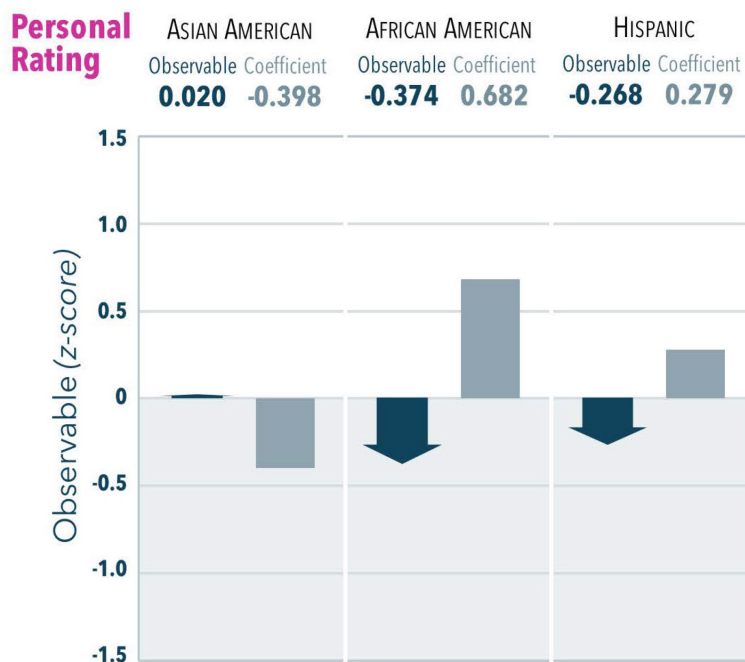
“Harvard maintains that race itself does not play a role in a student’s numerical personal score.” App.20. Harvard’s guidelines during the relevant years “did not mention whether race should be included in assigning the personal rating.” App.20.

As with the overall rating, Petitioners’ expert developed a logistic regression of the personal rating. Because “Harvard did not offer a competing regression model to show that no statistically significant relationship between Asian American identity and the personal rating exists,” the courts relied on Petitioners’ model of the personal rating. App.189–90. As the court of appeals noted, “[t]his logistic regression model showed that there was a negative correlation between an applicant’s personal rating and Asian American identity even when controlling for various factors related to” the personal rating. App.50.<sup>4</sup>

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<sup>4</sup> The opinion mistakenly says “related to admission.”





JA6015.<sup>5</sup>

The same pattern found in the overall rating holds for the personal rating. JA2273:19–2274:8. Here, the observable data suggests that Asian Americans should have better personal ratings compared to applicants from other groups. JA6015 (Asian American Observable +0.020; African American Observable -0.374, Hispanic Observable -0.268). But the opposite is true. The coefficients for Asian Americans are significant and negative for the personal rating. JA6012, 6015 (-0.398). This means that Asian Americans were less likely than whites to receive a good personal rating.

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<sup>5</sup> The results are similar when using the expanded dataset. Arcidiacono Rebuttal 115, 175, Tables 6.1R & B.6.12.R.

JA2257:23–2258:3. By contrast, the coefficients for African Americans and Hispanics are significant and positive, meaning they were more likely to score well on the personal rating than whites, other things equal. JA6012, 6015 (+0.682 and +0.279). These regression coefficients warrant an inference that just like the overall rating, the personal rating assigned by Harvard is “significantly influenced by race.” JA2258:6–7.

To illustrate the magnitude of the effect of race on the personal rating, Petitioners’ expert calculated the marginal effect of race on the personal rating. The effect of race on the personal rating is large. In the absence of race, the probability of Asian Americans receiving a 2 or better on the personal rating would increase from 17.8% to 21.6%, a 21% increase in their probability of receiving a 2 or better. JA6013. By contrast, the probability of African Americans or Hispanics receiving a 2 or better would drop significantly: from 19.3% to 15.2% for African Americans, a 21% decrease, and from 19.2% to 16.8% for Hispanics, a 12% decrease. JA6013. A likely explanation for these effects is that, just as with the overall rating, some Harvard readers give significant weight to an applicant’s race when scoring the personal rating.

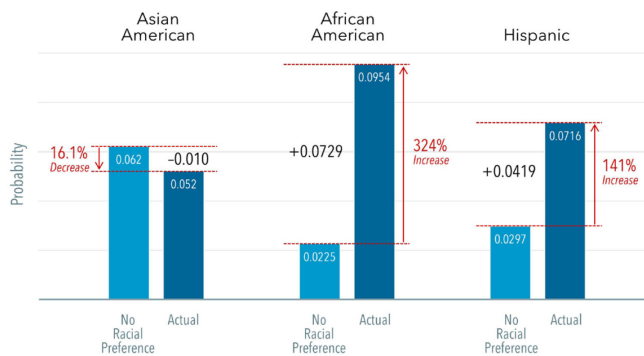
### **C. The personal rating significantly affects admissions modeling results.**

While there is no question that Harvard discriminates based on race at multiple stages, including when assigning overall ratings, the extent to which this evidence of discrimination is visible in the results of the admissions models depends on the

inclusion or exclusion of the personal rating. As the court of appeals correctly found, “[i]f the personal rating is excluded, ... being Asian American has a statistically significant negative effect on an applicant’s chance of admission to Harvard.” App.85–86. Even more clearly, the district court found that being African American and Hispanic is associated with a significantly increased chance of admission, compared to whites. App.209–10.

The admissions model preferred by Petitioners’ expert, without the personal rating, shows clear racial discrimination.

Marginal Effect of Race/Ethnicity on Probability of Admission



Baseline Dataset  
P435 (Arcidiacono Rebuttal Report, Tables 7.2R, 8.1N)

PD38 35

JA6017.

Being African American and Hispanic is associated with a 324% and 141% *increased* chance of admission compared to whites, respectively, while being Asian American is associated with a 16%

*decreased* chance of admission compared to whites. JA6017.

Harvard concedes that it gives “tips” to preferred races. According to Harvard, “race is a determinative tip for approximately 45% of all admitted African American and Hispanic applicants.” App.209. But Harvard disputes the extent to which Asian Americans do worse compared to whites. To the extent that this narrow statistical comparison is relevant, the admissions model preferred by Harvard’s expert suggests discrimination against Asian Americans *compared to whites* over all six years if only the personal rating is removed. JA3149:1–3152:3, 3223:2–13. Harvard’s expert conceded this at trial. JA3150:10–13, 3151:17–23.

***Harvard preferred model w/o personal rating***

<b>Class</b>	<b>Average Marginal Effect of Asian-American Ethnicity</b>
<b>1. 2014</b>	-0.76
<b>2. 2015</b>	-0.37
<b>3. 2016</b>	-0.45
<b>4. 2017</b>	0.05
<b>5. 2018</b>	-0.68 *
<b>6. 2019</b>	0.14
<b>Overall</b>	-0.34 *

Expert Report of David Card 74, Doc. 419-33, Ex.21.

In Harvard’s preferred model, the overall rate of admissions for Asian Americans compared to a counterfactual “if white” scenario was -.34% lower and, as the asterisk indicates, statistically significant, meaning it was unlikely to result from random

chance. JA3150:10–13. This number may seem small, but that is because the number of admitted students is very small compared to the number of applicants. The rate of admissions for Asian Americans is “between 5% and 6%.” App.170. Thus, for example, under Petitioners’ preferred model, the average marginal effect of 1% for Asian Americans translates to “an over 16 percent decrease in their admissions chances as a result of the Asian-American penalty.” JA2279:21–23. A -34% average marginal effect would similarly result in approximately a 6% reduction in the chance of admission for Asian Americans compared to whites. *See infra* p.23.

### **III. The Decisions Below Preferred Including the Personal Rating.**

Based on the personal rating model and other evidence, the district court recognized that “[t]he disparity in personal ratings between Asian American and other minority groups is considerably larger than between Asian American and white applicants.” App.193–94. This disparity “suggests that at least some admissions officers might have subconsciously provided tips in the personal rating, particularly to African American and Hispanic applicants, to create an alignment between the profile ratings and the race-conscious overall ratings that they were assigning.” App.194. Given the risk of racial bias, the district court found “that the model without the personal rating was ‘econometrically reasonable’ and ‘probative.’” App.87. But in the end, the district court nevertheless concluded that “including the personal rating results in a more comprehensive analysis.” App.87.

The court of appeals sustained this finding, for two reasons.

*First*, the court of appeals stressed that the personal rating was not influenced by Harvard's consideration of race. Instead, the court posited, the disparity was likely explained by white "privilege" outside of Harvard, reflected in part by white applicants' supposed better access to more enthusiastic recommenders. App.86–94. Based on this theory, the court of appeals accepted Harvard's contention that the risk of included variable bias from including the personal rating was low and "[w]ithout the personal rating, the model would suffer from omitted variable bias." App.94.

*Second*, the court also found that even excluding the personal rating, the statistical evidence did not suggest discrimination because any marginal effect for Asian Americans compared to whites was, in its view, small and likely caused by chance instead of discrimination. App.95–98.

### SUMMARY OF ARGUMENT

1. The Court should grant the petition because the robust statistical record and gin-clear evidence of discrimination make this case an ideal vehicle to revisit the lawfulness of race discrimination in college admissions under *Grutter v. Bollinger*, 539 U.S. 306 (2003).
2. The Court should also grant the petition because the robust statistical evidence of discrimination against Asian Americans compared to whites in Harvard's admissions makes this case an excellent vehicle to address how courts should treat claims of

invidious discrimination against colleges under Title VI.

The court of appeals' incorrect suggestion—that the statistical evidence does not support an inference of discrimination against Asian Americans—presents no vehicle problems. The court's conclusion resulted from a concerning misreading of the record, in which it confused Harvard's preferred model with Petitioners' preferred model. The court also misunderstood basic statistical principles for when an explanatory variable should be included or excluded from a regression model, preferring a model that included a racially biased variable. Finally, the court's white "privilege" hypothesis depended on non-record evidence and contradicts the court's own statistical conclusions.

## **REASONS FOR GRANTING THE PETITION**

### **I. The Statistical Evidence of Discrimination Makes This an Ideal Vehicle to Revisit Race Discrimination in College Admissions.**

#### **A. The Statistical Evidence is Robust.**

In 1978, the Court praised the "Harvard plan" as a proper way to consider race in an individualized, holistic admissions process. *Regents of Univ. of Calif. v. Bakke*, 438 U.S. 265, 316–19 (1978) (opinion of Powell, J.). Since then, the holistic admissions paradigm has spread through college campuses. But because Harvard's holistic process involves hundreds of considerations, including secret or subjective factors, the public has been unable to know how Harvard's admissions process operates in practice.

No longer.

The record in this case provides the Court an opportunity to assess how the Harvard plan works in reality and determine its consistency with the rule of law.

The statistical evidence in this case is robust.

*First*, the dataset is unprecedented in its breadth and completeness. It includes “six years of admissions data from the class years 2014 to 2019,” comprising “more than 150,000 applicants” and “about 10,000 offers of admission.” JA454:19–20; App.167. The dataset includes “hundreds of variables relating to each applicant’s demographic characteristics, personal background, geographic information, test scores, high school grades, ratings assigned by Harvard’s admissions officers, and Harvard’s admissions decision.” App.168.

*Second*, the logistic regression models are robust and provide an accurate picture of how Harvard makes admission decisions. The models “isolate the effects of race” while controlling for hundreds of other variables Harvard considers in the admissions process, allowing these models to accurately describe how much weight Harvard gives to race. App.181–82. While the experts disagree about modeling choices at the margins, their disputes have been tested through opening and rebuttal reports, lengthy trial testimony, and an appeal, generating lengthy decisions on modeling choices.

Simply put, this statistical record offers the Court a rare opportunity to assess Harvard’s holistic process on its own terms. The law surrounding affirmative action in college admissions is fractured and unclear.



This is in large measure because post-*Bakke* cases did not have well-developed records showing how an applicant's race factors into holistic college admissions decisions. This has resulted in a jurisprudence that speaks in Delphic generalities and with numerous caveats. The well-developed record in this case would give the Court the necessary specifics to delineate what is and what is not permissible. The Court should not let this record go to waste.

### **B. The Statistical Evidence of Racial Discrimination is Robust.**

In a limited class, a "tip" for some races is statistically the mirror image of a discriminatory penalty against other races. Admissions are zero sum. A tip for one race is thus a penalty against other races.

The record shows that Harvard's rating process includes significant tips for favored racial groups. Harvard, for instance, provides racial tips for African Americans and Hispanics in the overall rating. *Supra* pp.7–10. Harvard also provides racial tips for these groups in the personal rating. *Supra* pp.13–16. These tips significantly increase the chance of admission for African Americans and Hispanics, and therefore necessarily decrease the chance of admission for whites and Asian Americans. According to Harvard's expert, without racial preferences, the African American share of the class would fall from 14% to 6% and the Hispanic share would fall from 14% to 9%. App.209–10. Even on Harvard's own accounting, race was a determinative factor for nearly half of all admitted African American and Hispanic applicants. App.209. This statistical evidence of discrimination is compelling.

As economists, *amici* state no opinion on whether, as a legal matter, the compelling statistical evidence of racial discrimination in favor of African Americans and Hispanics—and therefore *against* Asian Americans and whites—is prohibited discrimination “on the ground of race.” 42 U.S.C. § 2000d. However, to the extent the Court thinks it appropriate to revisit the legality of racial discrimination in college admissions, the compelling statistical evidence of discrimination in the record makes this case an optimal vehicle to do so. Even if that question is not revisited, this case provides an excellent opportunity to provide much needed guidance for lower courts. For example, how large a “plus’ factor” can race be? *Grutter*, 539 U.S. at 335.

## **II. The Statistical Evidence of Discrimination Against Asian Americans Makes This an Ideal Vehicle to Clarify the Scope of Title VI.**

This case is also an ideal vehicle to resolve how the Court should treat claims of invidious discrimination alleging that colleges favor non-minority whites over minorities, here Asian Americans.

To resolve this question, the court below focused on whether there is evidence of a statistical penalty for Asian Americans *compared solely to whites*. As a statistical matter, that is an incomplete comparison. In any event, the statistical evidence in this case allows an inference of discrimination against Asian Americans compared solely to whites. See *supra* pp.15–16. Thus, this case also presents a rare opportunity for the Court to clarify the standard that

must be met to prevail in claims of invidious discrimination under Title VI.

Petitioners' preferred model shows that being Asian American is associated with a 16% decrease in the chance of admission *compared to whites*. JA6017. The statistical evidence is robust. Even using Harvard's own preferred model, simply excluding the personal rating shows statistically significant discrimination against Asian Americans compared to whites over the six years of admissions. *Supra* pp.15–16.

**A. The court below erred when it suggested the statistical evidence of an Asian American “penalty” was not significant.**

The court of appeals found that even when excluding the personal rating, the statistical evidence did not demonstrate discrimination against Asian Americans because any marginal effect for Asian Americans compared to whites was, in its view, slight. App.95–98.

This finding is based on a profound misunderstanding of the record and basic principles of statistical analysis.

*First*, the court erred in describing the record, incorrectly characterizing *Harvard's* own preferred model of admissions without the personal rating as *Petitioners'* preferred model. *Compare* App.95, with JA3151:17–23. The court said that *Petitioners'* “preferred model without the personal rating shows a statistically significant overall average marginal effect of -0.34%,” which it then characterized as small. App.95. In reality, *Petitioners'* preferred admissions model has an average marginal effect of over -1% and

suggests a hardly insignificant 16% penalty for Asian Americans compared to whites. JA2279:19–23.

*Second*, the court was incorrect that Harvard's model (which it incorrectly attributed to Petitioners) did not show discrimination. The court's finding that a marginal effect of  $-.34\%$  "is close to zero," App.96, profoundly misunderstands the basic principle of statistics that the significance of a marginal effect must be understood in the context of the original probability. So, for example, if a lottery ticket has a  $0.000001\%$  chance of hitting the jackpot, a tiny marginal increase of  $0.000001\%$  in fact doubles the overall chance.

Getting into Harvard is more likely than winning the lottery. But Harvard is one of the most selective schools in the country, with an acceptance rate of "between  $5\%$  and  $6\%$ " for Asian Americans. App.170. Thus, an average marginal effect of  $-.34\%$  is strong evidence that being Asian American results in a significant reduction in the chance of admission compared to whites. In real world terms, a  $-.34\%$  marginal effect means that the probability of Asian Americans being accepted declines by  $5.6\%$  to  $6.8\%$  compared to whites, instead of the  $16\%$  suggested by Petitioners' model.

The court below also claimed that this evidence was ambiguous because if one isolates a single year of admissions data, for most years considered alone the marginal effects are not statistically significant. App.96. That is the equivalent of saying that if one throws away most of the useful data, it is harder to show that the penalty against Asian Americans is unlikely to have arisen by chance. The court's focus on a single year in isolation, rather than the average

marginal effect for each year combined, is statistically unsound.

**B. The court below erred by finding that inclusion of the personal rating was proper.**

There is no disagreement that, if the personal rating is excluded from the admissions model, the statistical evidence shows significant discrimination against Asian Americans compared to whites.

But the court below thought it was reasonable to include the personal rating in the admissions model because the evidence did not show it was influenced by race. The court's rationale was statistically unsound.

**1. The personal rating's tips justify its exclusion.**

As the district court observed, the disparity in the personal rating "suggests that at least some admissions officers might have subconsciously provided tips in the personal rating, particularly to African American and Hispanic applicants, to create an alignment between the profile ratings and the race-conscious overall ratings that they were assigning." App.194.

If this hypothesis is correct, race influences the personal rating, and the personal rating should be excluded from the model. The reason is simple: "If race influences the personal rating, including it in the experts' regression models could make it appear as if Harvard does not discriminate when it does." App.88 (emphasis omitted). Including a control variable influenced by race is "statistically rather like saying

that once you correct for racial bias, Harvard is not racially biased.”<sup>6</sup>

Harvard’s expert acknowledged at trial that a variable is correctly excluded from a regression model if there is a substantial risk that it includes “tips” for favored minority applicants, since that biases the effect of race in the model:

**Q:** You think a rating cannot be used in your model even if the influence of race in that rating may be just a positive one, in other words, only a tip being given to African-Americans, Hispanics, and other groups, right?

**A.** Yes. If it was a pure tip based on the race alone, yes.

JA3221:9–13.

Harvard’s expert, to be sure, attempted to limit that concession by distinguishing “pure” or “per se” racial tips from the use of race as “a contextual factor.” JA3221:2–14. That distinction is unworkable. *Amici* are not aware of—and Harvard’s expert did not identify—any sound econometric method for distinguishing the use of race as a “pure” versus “contextual” tip. The subjective reason for the racial tip, or the method of applying it, is statistically irrelevant. What matters is that there is a racial tip in the control variable that biases the effect of race in admissions toward zero, causing included variable bias. That requires exclusion of the personal rating.

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<sup>6</sup> The Economist, *A Lawsuit Reveals How Peculiar Harvard’s Definition of Merit Is* (June 23, 2018), <https://econ.st/2MmJeYx>.

## **2. The court’s alternative “privilege” hypothesis is meritless.**

In a bid to keep the biased personal rating in the model, Harvard’s expert argued that exclusion of the personal rating would likely give rise to omitted variable bias. Harvard’s expert argued that factors outside of Harvard’s process may be causing the appearance that Harvard discriminates in the personal rating. The court of appeals took the bait. App.93. That was error.

At the outset, the court erred by asserting that Petitioners’ personal rating model showing racial bias was a “poor fit,” meaning the model did not explain the data well and hence “important explanatory variables may have been omitted from it.” App.89–90. That is wrong. For the measure of fit used in the personal rating model, “values of 0.2 to 0.4” are “an excellent fit.”<sup>7</sup> The value the court claimed is a “poor” fit is 0.28, well within the range of an excellent fit, as testimony established. JA2311:1–15. Although this does not disprove the possibility of omitted variable bias, it shows there is little risk that missing data could significantly alter the personal rating model’s results.

Next, the court’s belief that omitted variable bias was likely ignored basic economic principles. Both experts agreed on “a general principle of economics,” “that if a group is strong on observable characteristics, they tend to be strong on unobservable characteristics,” and vice versa. JA2265:11–13,

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<sup>7</sup> Daniel McFadden, *Quantitative Methods for Analyzing Travel Behavior of Individuals: Some Recent Developments* 35 (Nov. 22, 1977), <https://bit.ly/2JyWFCX>.

2447:5–8. Given the observable evidence, one would expect that any “missing data” would likely trend in the same direction, meaning more complete data would show that Asian Americans should be doing even better on the personal rating and that African Americans and Hispanics should be doing even worse. See *supra* pp.12–13. The risk of omitted variable bias given the observables is thus very low.

Ignoring this basic principle, the court found that “[w]ithout the personal rating,” an admissions model “would suffer from omitted variable bias.” App.94. (Again, for bias to arise, the omitted variable must (1) explain part of the personal rating score, the outcome, and (2) must also be associated with race, the variable of interest.)

To find omitted variable bias, the court zeroed in on “one likely factor” external to Harvard: white “privilege” in high school support. App.92. The court hypothesized the following: (1) school support letters show abilities like the capacity to “overcome obstacles,” App.91, (2) those abilities are not captured in Harvard’s numerical school-support ratings, so the abilities are uncontrolled missing data in the model, App.93 n.42, (3) that missing data, in turn, influences the personal rating, and (4) that missing data is also correlated with race because of white “privilege” in high schools, by which the court meant that whites have better access to enthusiastic recommenders compared to Asian Americans. App.92–93.

The white “privilege” hypothesis fails for at least two reasons.

*First*, to justify assumption (4), the court relied on non-record evidence from an *amicus* brief, asserting



that “[p]rivileged students likely have better access to schools with low student-to-teacher ratios and teachers and guidance counselors with more time to write strong, individualized recommendations.” App.92. That may or may not be so, but it is not in the record and was not subjected to the crucible of the adversarial process. Reliance on that non-record evidence is error, and alone justifies rejection of the court’s assertion of omitted variable bias.

*Second*, even if one credited the court’s white privilege theory, this would *strengthen*, not weaken, the case for excluding the personal rating. The relevant statistical question is whether the personal rating is biased by race, not whether it is biased against Asian Americans compared to whites. A variable is biased even if it includes tips for African Americans and Hispanics. If unobserved white privilege explained the apparent bias in the personal rating, one would expect that African Americans and Hispanics who also lack the same white privilege would have *worse* personal rating scores if this data were available. Thus, even assuming the court’s hypothesis is correct, the conclusion one would have to draw from it is that Harvard’s tips for African Americans and Hispanics in the personal rating are *even larger* than they appear based on the observable data, and even *more unlikely* to be caused by omitted variable bias.

The court’s white privilege hypothesis was unsound. The personal rating should be excluded. The court’s conclusion to the contrary raises no vehicle concerns because it was meritless.

**CONCLUSION**

The petition for certiorari should be granted.

Respectfully submitted,

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