Choosing a College: Evaluating the Relative Influence of Academic Fit versus Affordability on Financial Well-Being in Adulthood

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ABSTRACT

Many college-bound students face a tradeoff between attending a more academically selective or affordable institution. We link the universe of SAT-takers with their college enrollment records and financial information thirteen years after high school to examine which of these two factors more strongly predicts early-career financial well-being. Increasing quality of academic fit is associated with stronger financial well-being in adulthood, while college affordability is negatively correlated with annual income and less positively correlated with other outcomes, even after controlling for academic fit and institutional selectivity. These findings suggest that academic fit warrants more consideration than affordability for students who attend college to improve their financial circumstances, and policies that emphasize affordability over academic fit may harm students financially in the long run.

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1. Introduction

Over the past decade, improvements in data access and quality have generated growing interest in how college influences the long-term labor market and other life trajectories of students. Research has leveraged this data to show that students' expected labor market and social mobility prospects vary considerably across colleges and universities (Andrews, Li & Lovenheim, 2014; Chetty et al., 2017; Minaya & Scott-Clayton, 2018). Because costs also vary widely across institutions (Ma, Baum, Pender & Libassi, 2018), so too does the value proposition of attending different colleges (Barrow & Malamud, 2015; Oreopoulos & Petronijevic, 2013). Several studies in particular find that attending more academically selective institutions increases the expected earnings returns to college attendance (Cohodes & Goodman, 2014; Hoekstra, 2009; Zimmerman, 2014).

In light of this evidence, and amidst growing concern over rising college costs and student debt burdens, numerous advising initiatives have launched with philanthropic support to help students attend colleges and universities that are more academically competitive and financially affordable. These range from targeted programs like MDRC's College Match Program, which operated in Chicago and New York City from 2010-2014 and encouraged high school graduates to attend more academically selective colleges, to organizations like uAspire that help students identify affordable college options and navigate the financial aid system, to initiatives like CollegePoint that advise college-aspiring students nationwide on both academic and financial topics.

Many states and local communities have also introduced policies to reduce college admission and cost barriers for students. Nine states have automatic admissions policies that make the criteria for admission to colleges and universities more transparent (Education Commission of

the States, 2017), perhaps the most notable being Texas' ten percent plan, which guarantees admission to any public university in Texas for high school graduates who finish 11th grade within the top decile of their high school graduating class. The Texas plan has been shown to increase the probability that high-achieving, low-income students attend more academically selective institutions (Cortes & Lincove, 2018). Place-based scholarship initiatives, commonly referred to as "promise" programs, have also proliferated across the United States over the past 15 years to make local colleges more affordable and therefore more attractive options to attend. As of 2018, more than 200 promise programs were in operation across 41 states, including 16 statewide programs (Billings, 2018; Mishory, 2018).

Despite these substantial public and private investments to guide and improve college decision-making, it remains unclear whether policy efforts should encourage students to weight academic fit and affordability equally or differentially to maximize their college investment. This question warrants more attention because many students face a tradeoff between attending a more academically selective or a lower cost institution (Howell & Pender, 2016). Furthermore, if either academic fit or affordability leads to better long-term financial outcomes, then initiatives that implicitly or explicitly encourage students to prioritize one of these choice factors over the other could bolster or impair future well-being. Providing guidance around the relative importance of various information promises to simplify the complex college admissions process and produce better outcomes for students during college and beyond (Grodsky & Jones, 2007; Klasik, 2012; Page & Scott-Clayton, 2016).

Most studies to date have examined returns to college as a function of a single factor rather than multiple factors (Dillon & Smith, 2018; Daniels & Smythe, 2019), even though institutional factors tend to co-vary. This makes it difficult to evaluate the relative influence of various decision

criteria. When considering the interaction between academic selectivity and affordability in particular, it is unclear whether there are complementarities to attending both more academically selective and more affordable institutions because these factors are negatively correlated.

We believe this study is the first to consider the role of academic fit and college affordability in tandem to shed light on which more strongly predicts financial well-being in adulthood. We leverage a unique dataset that links the universe of SAT-takers who entered college in 2004 with their college attendance and degree records from the National Student Clearinghouse, college-level cost data from the Integrated Postsecondary Educational Data System (IPEDS) and the U.S. Department of Education's College Scorecard, and their financial records 13 years after high school completion from the TransUnion Credit Bureau. We use this data to examine how early-career financial well-being, as measured by annual income, debt levels, loan delinquency status, credit score, and neighborhood quality when individuals are in their early 30s, differs as a function of academic fit versus financial affordability. The detailed financial outcomes we observe and large sample also allow us to offer broader evidence on the consequences of academic fit, which to our knowledge is limited to examining impacts on college completion and earnings in the current literature (Bowen, Chingos, & McPherson, 2009; Dillon & Smith, 2018; Howell & Pender, 2016; Kurlaender & Grodsky, 2013).

Because student sorting is prevalent in higher education and our estimates are based on comparing observably similar students who made different college enrollment decisions, our goal is not to attribute causality to our results. Rather, we offer descriptive evidence of whether, all else equal, academic fit (defined as the percentile difference between a college's median SAT score and the student's own SAT score) or college affordability (as measured by average net price or median cumulative undergraduate debt) correlates more strongly with early-career financial

outcomes. In all analyses we control for a rich set of student-level covariates to better isolate the relationships between academic fit/college affordability and our outcomes of interest. We control for student sex, race, family income, parental education, SAT score, high school grades, and high school attended in our estimation models. Following Dale and Krueger (2002; 2014), we also proxy for college motivation and awareness by controlling for the number and selectivity of postsecondary institutions to which students submitted SAT scores.

Our results indicate that attending a more selective institution as defined by academic fit is positively associated with early-career income, while attending a more affordable institution is negatively associated with early-career income, even after controlling for academic fit and institutional selectivity. For example, attending a college where a student's level of academic fit is one standard deviation above the mean (which corresponds to moving from a "match" college to a "reach" institution) is associated with a 1.9 percent increase in annual income. We also find that attending a "match" college instead of an "undermatch" institution is associated with a 3.7 percent increase in income per year. By comparison, attending a college where median undergraduate debt is one standard deviation (approximately $5,000) below the mean is associated with a 3.4 percent decrease in annual income. A one standard deviation increment from the mean student debt burden is associated with a 2.6 percent increase in annual income. On several additional dimensions of financial well-being, including the probability of loan delinquency and the probability of having a strong credit score, we find that academic fit more strongly predicts financial outcomes when individuals reach their early 30s than college affordability. Furthermore, although students of all backgrounds benefit from attending more academically selective institutions, our results indicate that academic fit predicts early-career financial outcomes most strongly for higher-achieving students and students from more advantaged backgrounds.

We structure the remainder of the paper into four sections. In the next section, we review the existing literature on academic fit and college affordability pertinent to our examination of early-career financial outcomes. In section three, we describe our data and research design. We present our results in section four and conclude in section five with a discussion of the implications of our results for research and policy.

2. Prior Literature on the Returns to Academic Selectivity and Student-College Fit

2.1. Returns to Academic Selectivity and Match

Several studies find that attending more selective colleges increases the probability of graduation and earnings in adulthood. Most notably, a group of quasi-experimental studies exploit college admission cutoffs and find positive impacts on graduation and earnings among higher-ability students on the margin of the admission threshold (Hoekstra, 2009; Zimmerman, 2011; Cohodes & Goodman, 2014; Goodman, Hurwitz, & Smith, 2017). However, this research has typically focused on the effects of academic selectivity conditional on ability rather than on how the effects of selectivity vary over the student ability distribution (Oreopoulos and Petronijevic, 2013).

A growing number of studies in the academic match literature have examined the interaction between college selectivity and student ability. Yet this research has focused primarily on documenting and predicting the extent of academic "undermatch" (i.e., attendance at less-selective colleges than a student is academically qualified to attend) (Hoxby & Avery, 2013; Bowen, Chingos, & McPherson, 2009; Dillon & Smith, 2017; Kurlaender & Grodsky, 2013; Smith, Pender, & Howell, 2013). The current evidence base also provides an incomplete picture of the consequences of academic match because prior studies have primarily examined either the consequences of undermatch or overmatch, but not both, and have been limited to examining

impacts on graduation and major choice (Arcidiacono et al., 2016; Bowen & Bok, 1998; Kurlaender & Grodsky, 2013; Light & Strayer, 2000).

One exception is a recent study by Dillon and Smith (2018) that uses two waves of the National Longitudinal Survey of Youth to examine how both college quality and student ability influence academic outcomes and earnings after college. The authors find that attending more selective and higher-resourced institutions increases graduation rates and earnings across the ability distribution, but the effects are largest for students with higher test scores at entry. We build upon this study by examining how academic match influences other consequential financial outcomes later in life, including debt levels, loan delinquency, access to credit, and neighborhood quality. Our dataset also allows us to examine heterogeneity across student subgroups to a greater extent than before.

2.2. Returns to Other Dimensions of College Fit

We also contribute to the evidence base on the returns to college fit by broadening our definition of fit to include both academic match and financial affordability. Looking beyond academics, the relationship between student outcomes and other aspects of college fit are largely understudied, and it remains unclear how various dimensions of college fit interact. Two studies of which we are aware do consider the interplay between academic and non-academic fit. Cortes and Lincove (2018) study the role of academic and social matching (defined as attending a college with a high share of students in one's own racial/ethnic group) on admissions decisions and find that low-income students often experience a trade-off between the two, but the authors do not compare the consequences of academic versus social matching on student outcomes in their study. Howell, Pender, and Kumar (2016) use students' stated preferences for college (e.g., size, location, sector, urbanicity, distance from home) when sitting for the SAT to construct a measure of non-

academic fit. They find positive and complementary effects of both academic and non-academic fit on college completion among college-bound SAT-takers.

Despite the growing focus on cost in college decision-making (Kinzie et al., 2004; LaFave, Kelly & Ford, 2018), we are not aware of any studies that have compared the returns to academic fit versus college affordability on student outcomes. A large literature has examined the effectiveness of financial aid in isolation and generally shows that generous, simple, and targeted need-based aid programs can improve college access, attainment, and subsequent earnings by lowering costs for students and families (Angrist, Autor, Hudson, & Pallais, 2016; Castleman & Long, 2016; Denning, Marx, & Turner, 2019; Dynarski, 2003; Goldrick-Rab, Kelchen, Harris, & Benson, 2016). Recent evidence on the consequences of student debt is less conclusive. Two experimental studies find that increased borrowing improves academic performance and reduces the probability of loan default, although both studies focus only on students attending community colleges where debt levels are low on average (Barr, Bird & Castleman, 2019; Marx & Turner, 2019). Other studies that examine impacts among a nationally representative sample of students find that larger debt burdens cause individuals to work longer hours and delay homeownership (Daniels & Smythe, 2019; Mezza, Ringo, Sherlund & Sommer, forthcoming), and new evidence also indicates that student debt relief can reduce the probability of default on other types of debt and increase income and geographic mobility (Di Maggio, Kalda & Yao, 2019).

In addition to the mixed evidence on the consequences of student debt, the relative importance of academic fit versus college affordability is not obvious because these two dimensions are negatively correlated. For example, students who attend more selective institutions are less likely to default on their loans despite borrowing more on average (Looney & Yannelis, 2015). More selective colleges also typically carry higher published prices and financially

constrained students are more likely to undermatch academically due to sticker price shock (Hoxby & Avery, 2013; Dillon & Smith, 2017). Some students also face real tradeoffs between net price and selectivity when making college application and enrollment decisions (Howell & Pender, 2016; Mugglestone et al., 2019). As a result, understanding whether academic selectivity or college affordability more strongly predicts student outcomes requires examining one of these factors while holding the other constant. We add to the literature on the consequences of academic fit versus financial affordability by factoring the interaction between academic selectivity and college affordability into our empirical analysis.

3. Data, Sample, and Research Design

3.1. Data and Outcomes

We construct the dataset for this study from six sources. Student characteristics and SAT test scores are from College Board administrative records. We observe the college or university students first attended from National Student Clearinghouse (NSC) enrollment records and capture college-level attributes using data from the Integrated Postsecondary Educational Data System (IPEDS) and the U.S. Department of Education's College Scorecard.[1] As described in greater detail below, we calculate median SAT scores at each college using IPEDS data to construct a measure of academic fit, and we use average net cost of attendance from IPEDS and median undergraduate debt amounts reported in the Scorecard to construct measures of financial affordability.

[1] The National Student Clearinghouse collects data from 3,600 participating colleges and universities, which represent 98 percent of enrolled students across the country. NSC tracks individual students through their postsecondary education career. Participating institutions provide NSC with student-level data on enrollment by semester, graduation date, degree earned, and duration of studies.

The financial outcomes we focus on come from TransUnion, one of the three primary consumer credit bureaus in the United States.[2] For each college-bound senior in the College Board data, the data provides information on outstanding debt, estimated annual income, credit score, delinquencies on loan repayment (where delinquency is defined as a debt payment that is 30 or more days past due), and location of residence for former high school seniors.[3] To examine characteristics of the neighborhoods where individuals reside in their early 30s, we also incorporate data from the U.S. Census Bureau's 2016 American Community Survey. We report on seven outcomes 13 years after high school graduation using this data: estimated annual income, total debt, consumption debt (i.e., total debt excluding education and mortgage debt), education debt (from undergraduate and graduate education), the probability of loan delinquency (i.e., missing one or more loan payments over the past 12 months), the probability of having a VantageScore credit score ≥ 700, and neighborhood median household income.[4,5]

3.2. Defining Academic Fit

Four categories of academic fit are commonly referenced in the match literature: undermatch, safety, match, and reach (Hoxby & Avery, 2013). However, in our empirical work

[2] To contribute to research and policy discussions on how education experiences shape the trajectories of individuals after college, College Board acquired a de-identified dataset from TransUnion in 2017 on early-career financial outcomes of former high school seniors. Prior to acquiring the data, the data was stripped the file of all identifiers except an anonymized research identifier to ensure that individuals' privacy was protected.

[3] Estimated annual income is based on an algorithm that predicts total income from wages, investment income, alimony, business income, IRA distributions, pensions and annuities, real estate income, unemployment compensation, and Social Security benefits.

[4] Per our data agreement, we are precluded from reporting average credit scores. We therefore report on the probability of having a VantageScore of 700 or higher, which generally determines whether consumers have good credit for borrowing purposes (DeNicola, 2019).

[5] We also examined but choose not to report on homeownership (using mortgage debt as a proxy for homeownership) because many individuals who will eventually become homeowners do not own a home by age 35 (Moore, 2018). In addition, we find evidence in the data that individuals who attended more academically selective and less financially affordable institutions reside in communities in their early 30s that have lower homeownership rates overall. These patterns make it difficult to interpret the relationship between academic/college affordability and homeownership for individuals in their early 30s. We therefore rely on median household income in place of homeownership status to proxy for neighborhood quality.

we examine the relationships between academic fit and early-career financial outcomes continuously rather than categorically because the former allows for more accurate and precise estimation across the full academic fit distribution and across student subgroups. We followed the approach of Hoxby and Avery (2013) and Hoxby and Turner (2013) to define academic fit continuously. Specifically, for each student in the data we calculated the percentile difference between the median SAT score of enrolled students at the college a student first attended and the student's own SAT score.[6] This approach yields a continuous measure of academic fit, with higher values denoting attendance at a more academically selective institution. For example, a student with an academic fit value of 0 attended a college with a median SAT score equal to the student's own SAT score, while a student with a value of +10 attended a college with a median SAT score 10 percentile points greater than the student's own SAT score (this would be considered a reach college under the categorical approach).

In Figure 1, we illustrate how our continuous measure of academic fit maps to student SAT scores, institutional selectivity, and the four academic fit categories. The three solid-colored lines plot the relationship between student SAT scores and predicted income at age 31 for students who attended colleges of varying selectivity, as defined by the median SAT score of enrolled students at each institution. The dashed gray lines above the solid lines map the range of SAT scores at the midpoint of each selectivity band to each of the academic fit tiers.[7] For example, the dashed gray

[6] We calculated median SAT scores by averaging each college's 25th and 75th SAT percentile scores reported in IPEDS. If a college only reported ACT scores, we converted them to SAT scores using ACT-to-SAT concordance tables. For institutions that did not report either SAT or ACT scores in IPEDS, we calculated median scores using the set of SAT test-takers in the College Board data when the institution enrolled 50 or more SAT-takers.

[7] We defined the four fit tiers by coarsening our continuous measure of academic fit. We classify a student as undermatched if she enrolled in a college where her own SAT score exceeds the college's median SAT score by more than 15 percentile points. Safety colleges are those with median SAT percentiles 5 to 15 points below the student's SAT percentile. If the SAT percentile difference is within +/- 5 percentile point of zero, the student-college combination is considered an academic match. Academic reaches are institutions with median SAT scores more than 5 percentile points above the student's own SAT score.

line that lies above the green line indicates that a college with a median SAT score of 1150 is a "reach" institution for students with SAT scores below 1120, while students who "undermatched" to the same institution scored above 1340 on the SAT.

Figure 1 shows that within each selectivity band students with higher SAT scores are predicted to earn more in their early 30s. We also see that for a given SAT score, students who attend a higher fit institution (by virtue of attending a more selective college) are expected to have higher incomes. For example, the early-career income of a student who scored 1300 on the SAT and "matched" to a college with a median SAT score of 1250 is predicted to be more than $15,000 higher than a student with the same SAT score who "undermatched" to a college with a median SAT score of 1050. These results provide suggestive evidence that academic fit is strongly associated with income later in life for students attending colleges with median SAT scores between 1000 and 1300. In our main results, we examine whether the patterns in Figure 1 generalize across the full academic fit distribution.

3.3. Defining Affordability

We use two measures to examine the relationship between financial affordability and early-career financial outcomes: average net price and median cumulative undergraduate debt at the first institution students attended. Both measures capture the *expected* amount that students paid or borrowed to attend college, not the actual amount paid or borrowed, because we do not observe the latter in the data. As a result, we expect a moderate amount of measurement error in both measures that will attenuate the estimated correlations between financial affordability and early-career financial outcomes. We therefore conduct analyses using two different affordability measures to examine the robustness of our results. The correlation between these two measures is 0.730, indicating that they are far from perfectly correlated and do not capture the exact same

dimension of affordability. Nevertheless, we obtain substantively similar results across most estimates using either measure. In the few instances where our results differ, we give more credence to the estimates that proxy for financial affordability using median debt because, as described in detail below, median debt is likely measured with less error than average net price by virtue of observing median debt at the institution-by-income level and average net price at only the overall college-level.

Cumulative undergraduate debt amounts are maintained for all federal student loan borrowers by the National Student Data Loan System (NSDLS) and reported in aggregate at the institution-level (overall and disaggregated by student characteristics) in the U.S. Department of Education's College Scorecard dataset. We assigned an expected debt amount to each person in the data using institution-by-family income category median debt measures mapped as closely as possible to the income categories that students self-reported to the College Board during high school.[8] We assigned an average net price value to each person in the data using net price data reported by institution in IPEDS. Colleges began reporting the average net price for full-time, first-time degree/certificate-seeking undergraduates who received federal student aid and paid the in-state or in-district tuition in 2006-07. To account for the fact that the students in our analysis first entered college two years before average net price data is available, we deflated the average net prices in 2006-07 to 2004-05 prices using sector-specific average net price growth rates.[9]

[8] More specifically, we assigned students with family income below $40,000 the median debt amount at the college they attended among borrowers with family income below $30,000. For students with family income between $40,000-$80,000, we assigned the median debt amount among borrowers with family income between $30,000-$75,000. We assigned the median debt amount among borrowers with family income greater than $75,000 to students with family income greater than $75,000. Forty-one percent of students did not report family income to the College Board; for those students, we assigned the median debt amount among all borrowers at the first college they attended.

[9] In 2006-07 and 2007-08, institutions reported only an overall average net price charged to students. Institution-by-family income average net prices analogous to the Scorecard debt measures are available in IPEDS starting with 2008-09 cohort. We explored but ultimately chose not to assign students an imputed institution-by-income net price value because small institution-by-income cell sizes yield unreliable out-of-sample predictions for many colleges.

In Figure 2, we document the extent to which median cumulative undergraduate debt and average net price vary by the four categories of academic fit. Academic fit and college affordability are positively correlated, but there is substantial variation in how much students pay and borrow for college both within and across academic fit categories.[10] For example, the interquartile range of undergraduate debt is $7,956 and $8,846 among students who attended "safety" and "reach" institutions, respectively, and the distributions overlap considerably across these two fit categories. As discussed in detail in Section 3.5, we control for academic fit (college affordability) when estimating relationships between college affordability (academic fit) and early-career outcomes to account for the covariance between these measures.

3.4. Sample

Our analytic sample includes high school graduates in 2004 who took the SAT and enrolled in college within 6 months of high school completion.[11] The 2004 graduation cohort is the furthest back for which we observe early-career financial outcomes. For this cohort of students, we observe financial outcomes 13 years after high school graduation, or at around age 31. Our final sample consists of 953,109 students. We report summary statistics for the sample in Table 1.

Nearly one-third of students are students of color and 12 percent are first-generation college students. Thirty-eight percent of the sample overall (and 65 percent of students who reported family income) come from families with incomes below $80,000. On average, students attended a match institution where the college's median SAT score was 3 percentile points greater than their own SAT score.[12] However, 18 percent, 15 percent, 22 percent and 45 percent of students attended

[10] The correlation between academic fit and median cumulative undergraduate debt and between academic fit and average net price in our data is 0.187 and 0.129, respectively.

[11] We exclude from our analyses nearly 360,000 SAT-takers from the high school graduating class of 2004. Specifically, we exclude students who do not enroll in college at all (N=136,096) or within six months of high school graduation (N=180,951), or who are missing important covariates (N= 40,954).

[12] The average difference between a student's own SAT score and the median SAT score at their college is slightly greater than zero in our sample due to our sample restrictions. On average, students who matriculate to college within

undermatch, safety, match, and reach institutions, respectively. Likewise, students on average attended institutions where the average net price was $15,341 (in 2018 dollars) and the median cumulative undergraduate debt load was $10,893, but these amounts vary considerably across the sample. The standard deviation across our two financial affordability measures is $8,431 and $5,208, respectively.

Thirteen years after high school graduation the individuals in our sample had relatively strong financial profiles. For example, their average income was $91,364, which is 20 percent higher than the average of the median household income in their surrounding neighborhoods. In addition, over 60 percent of individuals in our sample had credit scores of 700 or higher compared to 43 percent of all individuals with credit reports nationwide (Comoreanu, 2018), and fewer than one-quarter had been delinquent on a loan payment over the previous 12 months.

3.5. Estimation Strategy

To examine the relationship between academic fit and early-career financial outcomes, we estimate linear regression models of the following form:

(1) $$Y_{ij} = \sum_{k=1}^{k=3} \beta^k AF_i^k + \delta X_i + \gamma P_i + \omega_j + \varepsilon_{ij}, \text{ where}$$

Y_{ij} is one of the early-career financial outcomes observed for student i from high school j 13 years after matriculating to college. AF_i is our measure of academic fit, again defined as the percentile difference between a student's own SAT score and the median SAT score at the college first attended. We include quadratic and cubic polynomial terms of AF_i in the model to allow for the relationships between academic fit and financial outcomes to vary non-linearly over the academic

six months of high school graduation score slightly higher on the SAT compared to the full population of college-bound SAT-takers.

fit distribution.[13] To better isolate those relationships, we control for a rich set of student background characteristics. X_i is a vector of student-level covariates comprised of indicators for female, race, parental educational attainment (entered separately for mothers and fathers), family income, and high school GPA, and a continuous measure of SAT score (combined math and verbal). Because quality of academic fit can be partly determined by the portfolio of institutions to which students apply, in P_i we proxy for the number and academic selectivity of institutions to which students applied using the number of institutions to which students submitted SAT scores, and the mean and standard deviation of the median SAT score across the colleges to which students submitted scores.[14] $\omega_j$is a vector of high school fixed effects that control time-invariant, high school-specific (and, by proxy, neighborhood-specific) effects on early-career financial outcomes correlated with academic fit. ε_{ij} is a residual error term, which we cluster by high school. We augment equation (1) with subgroup-by-academic fit interaction terms to examine whether the relationship between academic fit and early-career financial outcomes varies by student race, first-generation status, family income, and SAT achievement quartile.

Because direct interpretation of the coefficient estimates in our estimation models is made difficult by the polynomial and interaction terms, we report predicted outcome values as a function of academic fit or college affordability, evaluated at the average values of all other student background characteristics. Estimates from equation (1) are reported in outcome levels (i.e.,

[13] Across most outcomes, quadratic, cubic, and quartic terms are statistically significant at the 5 percent level. We exclude the quartic term from equation (1) to avoid issues of overfitting and because our results do not change with the addition of the term.

[14] Controlling for the number and quality of student score sends is in the spirit of Dale and Krueger (2002; 2011), who estimate earnings returns to college selectivity by comparing students who applied and gained admission to the same set of institutions but chose to attend different colleges. We cannot follow their approach directly because we do not observe application or admission decisions in the data. However, Dale and Krueger (2002) show that their estimates are robust to models that replace portfolio fixed effects with controls for the number and average selectivity of applications students submitted. This provides suggestive evidence that controlling for the number and quality of score sends is a reliable proxy to controlling for students' choice set.

$1,000s or percentage points) per 10-point academic fit intervals. To examine subgroup differences, we report estimates in terms of percent changes from baseline per 10-point increase or decrease in academic fit.[15] We formally test for heterogeneity in the returns to academic fit by conducting F-tests of whether the estimated percent changes are equivalent across student groups.

To examine whether academic fit or college affordability more strongly predicts early-career financial outcomes, we augment equation (1) with measures of college affordability. We fit the following linear regression model to examine this question:

$$(2) \qquad Y_{ijt} = \sum_{k=1}^{k=3}(\beta'^{k} AF_i^k + \alpha^k FA_i^k + \tau^k AF_i^k * FA_i^k) + \delta X_i + \gamma P_i + \omega_j + \zeta_t + \varepsilon_{ij}.$$

In equation (2), FA_i is one of our two college affordability measures – either median undergraduate debt or average net price. The interaction term $(AF_i * FA_i)$ allows for college affordability to influence the relationship between academic fit and financial outcomes, and vice versa. Once again, we include polynomial terms to allow for those relationships to change non-linearly over the distribution of academic fit and college affordability values. We also include college selectivity tier-by-sector fixed effects, denoted by ζ_t, to account for the fact that college affordability is strongly negatively correlated with selectivity and private sector status.[16] Following Chetty et al. (2017), we categorize institutions into one of 11 tiers based on their 2009 Barron's selectivity ranking and sector.[17] Including selectivity-by-sector tier fixed effects ensures that the estimated

[15] This approach enables us to examine whether the relationship between academic fit and outcomes is proportional across groups, even when baseline outcome levels are different across groups.

[16] In our analytic sample, the correlation between median undergraduate debt and selectivity tier is 0.69 and the correlation between average net price and selectivity tier is 0.51. By comparison, the correlation between academic fit and selectivity tier is only 0.18. As a result, the estimated relationships between academic fit and early-career financial outcomes are robust to the inclusion or exclusion of selectivity tier fixed effects, and we exclude them from equation (1) for parsimony, whereas the estimated relationships between college affordability and financial outcomes suffer from omitted variable bias when college selectivity is not controlled for in equation (2).

[17] Specifically, we group 4-year colleges into nine tiers: Ivy-Plus (the Ivy League plus Stanford, MIT, Chicago, and Duke), elite (Barron's Tier 1 excluding the Ivy-Plus), highly selective (Barron's Tier 2) publics, highly selective privates, selective (Barron's Tiers 3-5) publics, selective privates, non-selective (Barron's Tier 9 and all four-year colleges missing a Barron's selectivity index rating) publics, non-selective privates, and for-profit four-year

relationships between college affordability and early-career outcomes are not conflated by the relationship between institutional selectivity and those same outcomes. All other terms in equation (2) are specified as in equation (1).

To facilitate interpretation of estimates from equation (2), we report mean outcome levels and percent changes associated with a standard deviation increase or decrease from the mean.[18] For this set of analyses we also hold college affordability constant at the mean to isolate the relationship between academic fit and financial outcomes. Likewise, we hold academic fit constant at the mean when evaluating the relationship between college affordability and our outcomes of interest. We then conduct F-tests to evaluate if the estimated percent changes associated with varying the level of academic fit versus college affordability are statistically equivalent.

4. Results

4.1. Relationships between academic fit and early-career financial outcomes

We now turn to the results of fitting equation (1) to the data. Figure 3 and Table 2 report the relationship between academic fit and financial outcomes thirteen years after college entry over the full academic fit distribution. Consistent with the graphical analysis in Figure 1, the results in Panel A of Figure 3 indicate there is a strong, positive relationship between academic fit and predicted annual income over the full academic fit distribution. The results also show that income returns are largest towards the lower end of the distribution (researchers have typically classified students below -15 as undermatched). For example, a 10-point increase in academic fit off a baseline of -20 (a shift from undermatch to safety institution) is associated with a 3.5 percent

institutions. We categorize 2-year colleges into two tiers: public and private non-profit colleges, and for-profit institutions.

[18] This approach enables us to compare whether academic fit or college affordability more strongly predicts early-career financial outcomes, even though the measures of academic fit and college affordability are on different scales.

increase in annual income, from $85,377 to $88,339, whereas a 10-point increase off a baseline of +10 (upward move across reach institutions) is associated with a 2.3 percent increase in annual income, from $93,705 to $95,892.

Panel B of Figure 3 reveals that academic fit is also positively associated with holding more debt when individuals are in their early 30s. Most of the increase in debt is due to accumulation of more investment debt in the form of student loans and home mortgages. By contrast, the relationship between academic fit and consumption debt is very weak. As shown in Table 2, a 10-point increase in academic fit is associated with an increase in consumption debt of less than $150, or less than one percent, across the academic fit distribution. Panels C and D of Figure 3 also provide evidence that individuals who attend more selective institutions are well-positioned to pay off their larger debt obligations. The probability of missing a loan payment over the past 12 months decreases by approximately one percentage point per 10-point increase in academic fit. Likewise, a 10-point increase in academic fit is associated with a 1.3 to 2.0 percentage point increase in the probability of having a credit score of 700 or higher. In the last row of Table 2, we further show that attending a more selective college is associated with living in higher-income neighborhoods thirteen years after attending college. Taken together, the results in Figure 3 and Table 2 provide strong evidence that attending a more academically selective institution is associated with having a stronger financial profile at age 31, and those returns accrue across the entire academic fit distribution (gains are relatively consistent as one moves from an academic undermatch to match to reach category).

4.2. Returns to academic fit by student subgroup

Although the benefits to academic selectivity are experienced broadly, some students may experience larger returns than others. In Figure 4, we present graphical results of whether the

relationship between academic fit and predicted annual income varies by SAT achievement quartile, underrepresented minority (URM) status (defined as non-White and non-Asian students), family income, and first-generation status. In Tables 3-6, respectively, we report estimated returns by subgroup across the full set of financial outcomes and the results of F-tests of whether the estimates differ across groups.

Consistent with Dillon and Smith (2018), who find that higher-achieving students benefit relatively more from attending more selective and better resources colleges, our results suggest that the income returns to college selectivity are highest among students with SAT scores of 1200 or higher, which comprises the top quartile of college-bound test-takers. Results in table 3 show that a 10-point increase in academic fit off a baseline of -10 (i.e., moving from a safety to an academic match institution) is associated with a 4.1 percent increase in annual income among top-quartile students compared to 2.7 percent for students whose SAT scores fall within the second quartile (ranging between 910 and 1040). Likewise, we estimate larger relative income returns among non-URM students in Table 4. The same 10-point increase in academic fit off a baseline of -10 is associated with a 3.2 percent increase in annual income among non-URM students versus 2.5 percent increase for URM students. We find no evidence of heterogeneity in income returns by family income or first-generation status in Tables 5 and 6, respectively.

Looking beyond income returns, we find additional evidence of heterogeneity in returns to academic fit on several financial outcomes. The relationships between academic fit and loan delinquency and academic fit and neighborhood quality are stronger for students with SAT scores in the top quartile and students from more advantaged socioeconomic backgrounds. For example, as shown in Table 3, a 10-point increase in academic fit off a baseline of -10 is associated with an eight percent decrease in the probability of missing a loan payment and a 1.6 percent increase in

neighborhood median household income for top-quartile students versus a 2.6 percent decrease in the probability of loan delinquency and a 0.7 percent increase in neighborhood median household income for students with SAT scores in second quartile. We report similar patterns in Tables 4-6 with respect to URM status, family income, and first-generation status, respectively. The point estimates are larger among non-URM, high-income, and non-first-generation students relative to their counterparts.

However, returns to academic fit are not larger for higher-scoring and more advantaged students across all outcomes. With respect to credit scores, we find that lower-scoring students and students from less advantaged backgrounds experience greater benefit to attending more selective institutions. The estimated returns by family income reported in Table 5, for instance, indicate that a 10-point increase in academic fit off a baseline of -10 is associated with a 3.5 percent increase in the probability of having a credit score of 700 or higher for students with family income below $40,000 compared to 2.9 percent for students with family income of $80,000 or higher. We observe similar results with respect to SAT achievement and URM and first-generation status in Tables 3, 4, and 6, respectively.

4.3. Predicting early-career financial outcomes: academic fit versus college affordability

The next set of results comes from our analysis of whether academic fit or college affordability more strongly predicts early-career financial outcomes. In Figure 5, we report estimated percent changes in annual income associated with a standard deviation increment and decrement from the mean level of academic fit, median cumulative undergraduate debt, and average net price.[19] To align the estimates associated with academic fit and college affordability in the same direction and facilitate interpretation, we reversed the sign of the median debt and

[19] The mean (standard deviation) values of academic fit, median cumulative undergraduate debt, and average net price are 3.4 (21.7), $10,893 ($5,208), and $15,341 ($8,431), respectively.

average net price measures for this set of analyses. As a result, a one standard deviation increment (decrement) from the mean denotes attendance at a better (worse) academic fit or more (less) affordable institution in expectation.

Consistent with the results discussed above, there is a clear positive relationship between academic fit and annual income in Figure 5. By contrast, our estimates indicate that college affordability and annual income are negatively correlated, even after controlling for academic fit and institutional selectivity. All else equal, attending a college where median undergraduate debt is approximately $5,000, or 50 percent, less than the average amount a student in our sample is expected to borrow is associated with a 3.4 percent *decrease* in annual income when individuals reach their early 30s. Likewise, attending a college where average net price is approximately $8,400, or 50 percent, higher than the typical cost to students is associated with a 3.5 percent *increase* in annual income. We reject that the relationships between academic fit and income and college affordability and income are equal (p-values from F-tests of equal effects are less than 0.001) and conclude that attending a better academic fit institution is positively associated with early-career income, while attending a more affordable institution is negatively associated with early-career income.

In Tables 7 and 8, we report results analogous to Figure 5 across the full set of early-career outcomes using median cumulative undergraduate debt and average net price, respectively, to examine the relationships between college affordability and outcomes. Consistent with the expectation that attending a more affordable institution positions individuals to accumulate less debt over time, we estimate that attending a college where median undergraduate debt is approximately $5,000 less than the average amount borrowed is associated with a 13.9 percent *decrease* in education debt at age 31 (column 5 in Table 7). The estimated decrease in education

debt using average net price to proxy for college affordability is 12.7 percent (column 5 in Table 8). We also find that attending a more affordable college is associated with lower debt burdens overall, ranging from 2-5 percent. However, across most other outcomes, our results reinforce that, at best, there is a weak positive relationship between college affordability and early-career financial well-being, and at worst the two are negatively correlated.

In Table 7, our results imply that attending a college where median undergraduate debt is approximately $5,000 less than the average amount borrowed is associated with a 2.1 percent increase in the probability of missing a loan payment over the past 12 months, a 2.3 percent decrease in the probability of having a credit score of 700 or higher, and a 0.8 percent decrease in neighborhood median income. We estimate a similar relationship between college affordability and neighborhood median income in Table 8 using average net price to measure college affordability. Furthermore, although we estimate that attending a college where average net price is one standard deviation below the mean is associated with a 3.4 percent decrease in the probability of loan delinquency, a one standard deviation increment in net price is associated with no change in the probability of loan delinquency. Likewise, our estimates in Table 8 imply that average net price is not correlated with the probability of having a credit score of 700 or higher. By comparison, all of the estimated relationships between academic fit and outcomes in Tables 7 and 8 are positive, substantively large, and statistically significant. In summary, our results indicate that academic fit more strongly predicts financial well-being when individuals reach their early 30s than college affordability.

5. Conclusion

The complexity of the college admissions process and concern that many students are not fully capitalizing on their college investment have marshalled a wide array of policy initiatives to

improve college decision-making. Despite the breadth of information conveyed to prospective students and families about their college options, there has been little research investigating whether some information deserves relatively more consideration when choosing a college. We add to the literature on college choice by examining how early-career financial well-being differs as a function of academic fit versus financial affordability.

Our results indicate that increasing quality of academic fit is associated with stronger financial well-being in adulthood at all points along the fit distribution, but with stronger returns for higher-scoring students and students from more advantaged backgrounds. We find considerably weaker relationships between college affordability and early-career financial well-being on most measures. In the case of annual income, our results indicate that attending a more affordable college or university is associated with having lower income at age 31, even after controlling for student background characteristics, quality of academic fit, and institutional selectivity. The results as a whole suggest that academic fit may warrant more consideration than affordability in the college decision process.

One of the more intriguing findings, given concern over rising college costs, is the negative correlation that we estimate between college affordability and annual income. This result is consistent with prior studies that have examined the impact of undergraduate debt on labor market outcomes and may be driven by the fact that attending a more expensive institution increases real or perceived pressure to choose high-salary jobs and work longer hours (Coffman, Conlon, Featherstone, & Kessler, 2019; Daniels & Smythe, 2019; Rothstein & Rouse, 2011). The positive and economically significant relationship between academic fit and annual income that we document is also similar in magnitude to the earnings returns to college quality that Dillon and Smith (2018) estimate. Our results therefore suggest that students on average neither face a tradeoff

between attending a more academically selective versus a more affordable institution, nor benefit more from attending institutions that are both more academically selective and more affordable, at least with respect to maximizing their annual income at age 31. A direct interpretation of our results therefore implies that students are best positioned to maximize their future income by attending the most academically selective and least affordable college in their choice set; however, we believe this interpretation is overly literal and prescriptive. A more prudent interpretation is that advising efforts can best position students for long-term financial success by helping them identify which colleges they can afford and encouraging them to attend the most academically selective institution among the affordable options.

We conclude with three limitations that warrant consideration when assessing the policy implications of our findings. First is the issue of measuring college affordability in our dataset. Although we proxy for affordability in two way to reduce measurement error, the reported correlations between financial affordability and outcomes are likely biased towards zero because we cannot measure affordability at the student-level. The relative differences in results between academic fit and college affordability may also be overstated for this reason, although the fact that many of the estimates are opposite-signed and very large in magnitude suggests the differences are not primarily due to measurement error. Nevertheless, using more reliable cost data could expose novel insights that we are unable to detect.

Second, despite most students reportedly attending college to improve their labor market prospects (Eagan et al., 2017), it remains unclear whether academic fit is also a relatively stronger predictor of other meaningful life outcomes such as health status, civic participation, and subjective well-being. In addition, for tractability and due to data limitations, we considered only two dimensions of college choice in this study, even though students and families typically

consider many more, including distance, amenities, campus diversity, social climate, and safety, when choosing where to apply and enroll. More research is therefore needed to understand the relative importance students might consider placing on various factors when choosing a college and how that prioritization could vary over educational objectives. Gaining more insight into these issues promises to reduce the complexity of college admissions for millions of students.

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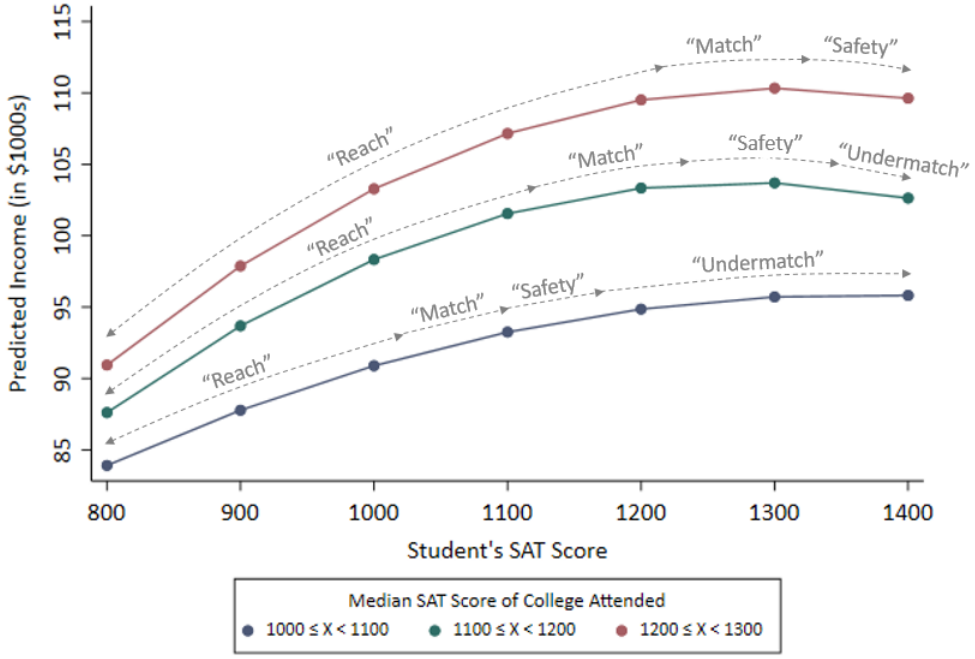
FIGURES AND TABLES

Figure 1. Estimated annual income 13 years after college entry by individual student SAT score and college selectivity

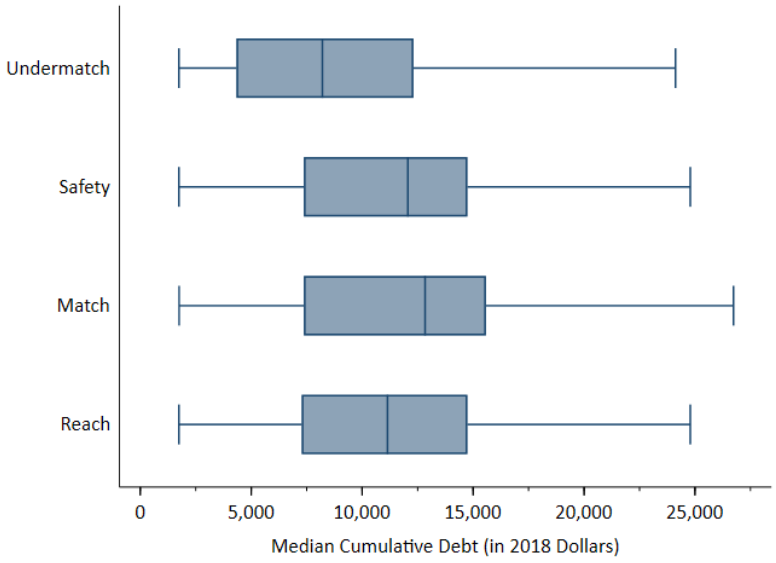


Notes: The sample is restricted to 2004 high school graduates who took the SAT and enrolled in college within 6 months of high school completion. Each line plots predicted values from a separate student-level regression of predicted income on SAT score and SAT score squared.

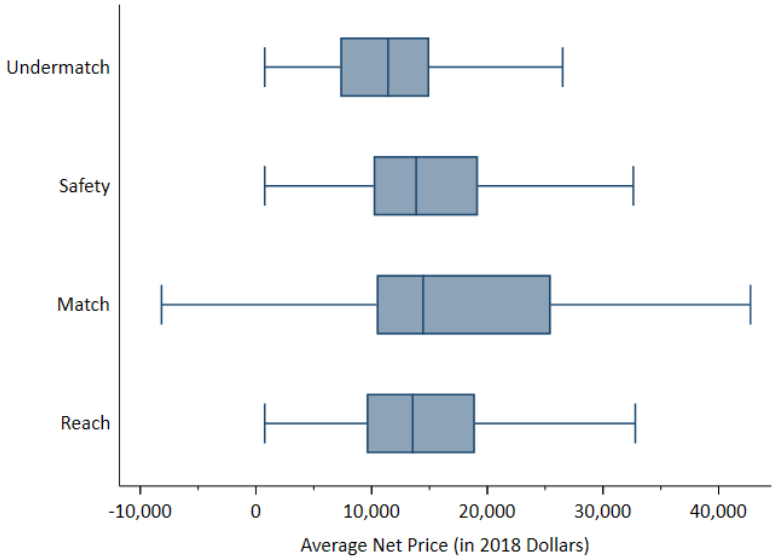
Sources: College Board and TransUnion Credit Bureau data.

Figure 2. Distribution of estimated undergraduate debt and average net price by academic fit categories

A. Estimated Undergraduate Debt



B. Average Net Price

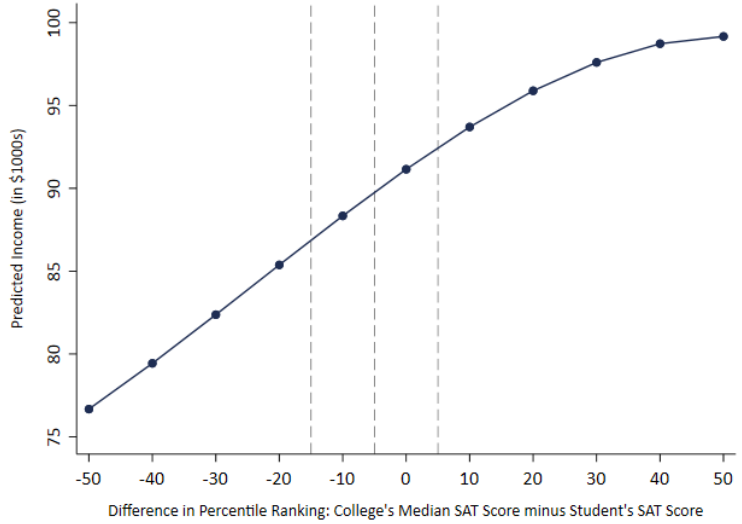


Notes: Estimated undergraduate debt is assigned to each student using institution-by-income median debt amounts reported in the College Scorecard. Average net price is assigned to each student using 2006-07 average net price amounts reported in IPEDS deflated to 2004-05 values using sector-specific average net price growth rates. Four-year college students who attended an undermatch, safety, match, and reach institution attended a college whose median SAT score among enrollees was respectively: 1) more than 15 percentile points below the student's own SAT score, 2) between 15 and 5 percentile points below the student's own SAT score, 3) between 5 percentile points above or below the student's own SAT score, and 4) more than 5 percentile points above the student's own SAT score. Two-year college students with SAT scores below (above) 1000 attended a match (undermatch) institution.

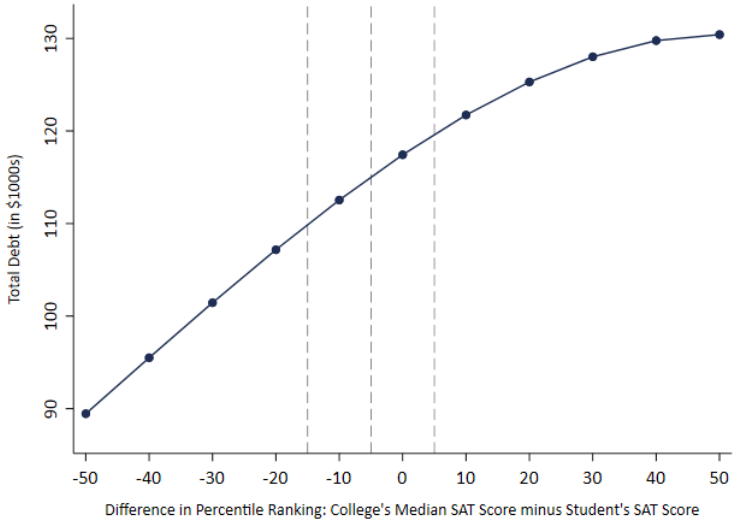
Sources: College Board, U.S. Department of Education's College Scorecard, and Integrated Postsecondary Education Data System (IPEDS) data.

Figure 3. Estimated financial outcomes 13 years after college entry by academic fit

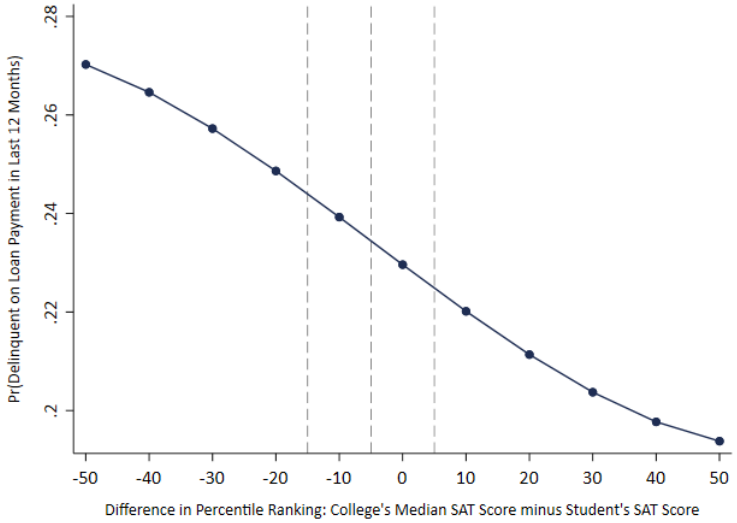
A. Predicted Income



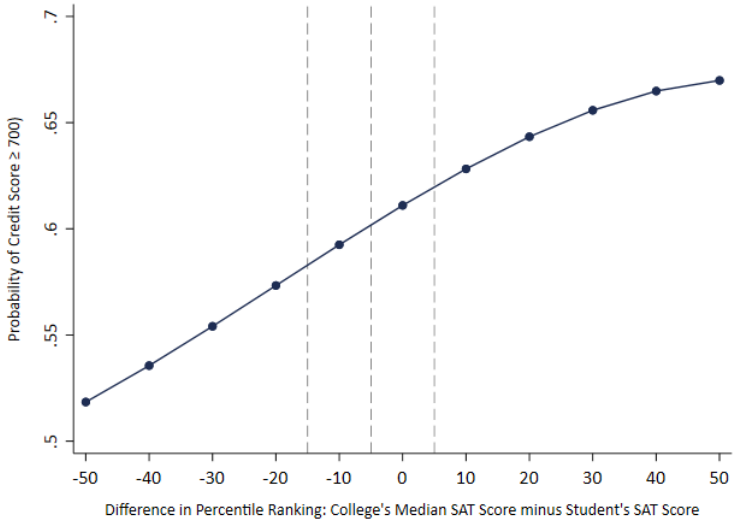
B. Total Debt



C. Pr(Loan Delinquency) in Past 12 Months



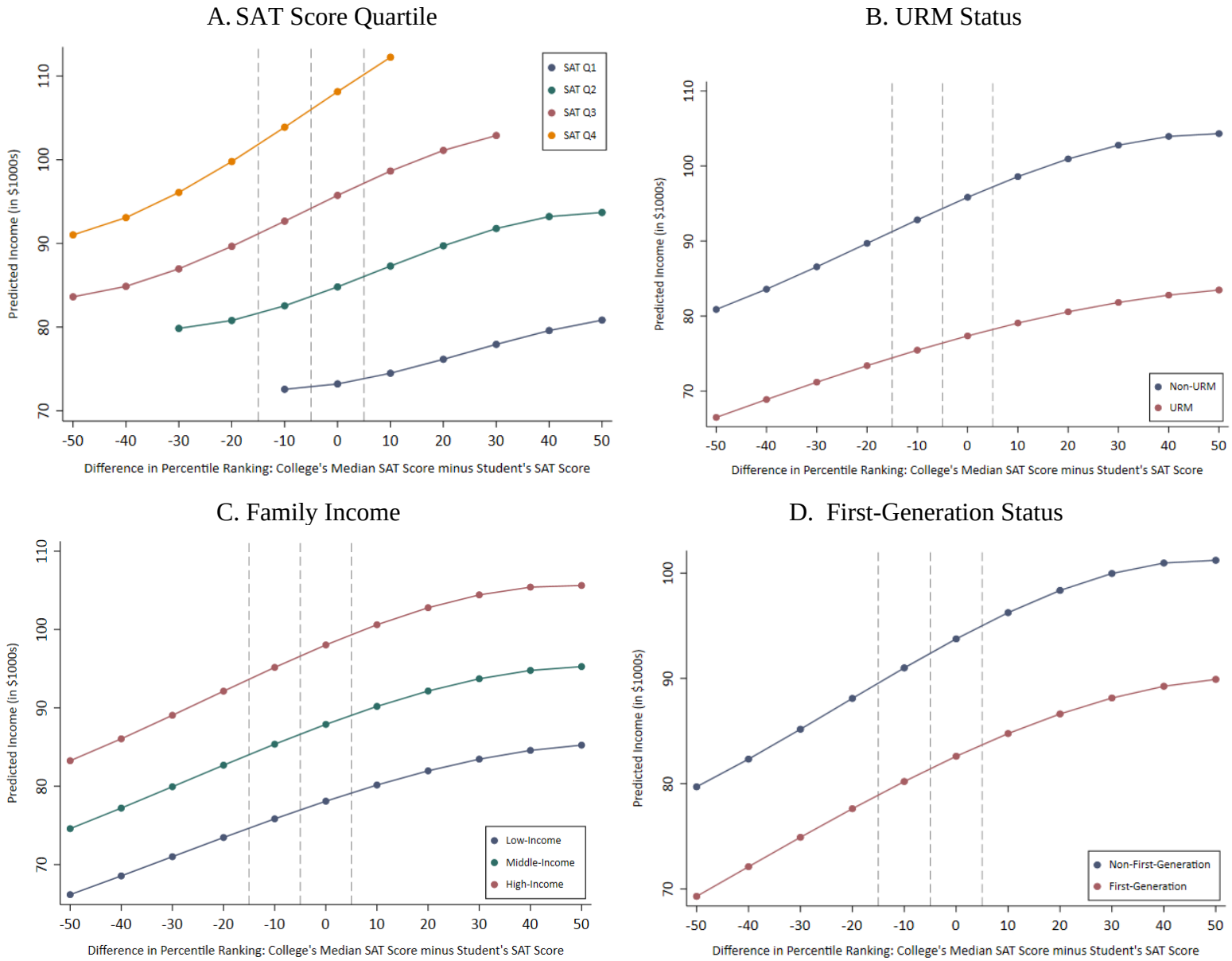
D. Pr(Credit Score ≥ 700)



Notes: The sample is restricted to 2004 high school graduates who took the SAT and enrolled in college within 6 months of high school completion. Predicted values are estimated from models as specified in equation (1). The vertical lines from left to right respectively denote the upper bounds for commonly defined academic "undermatch", "safety", and "match" categories.

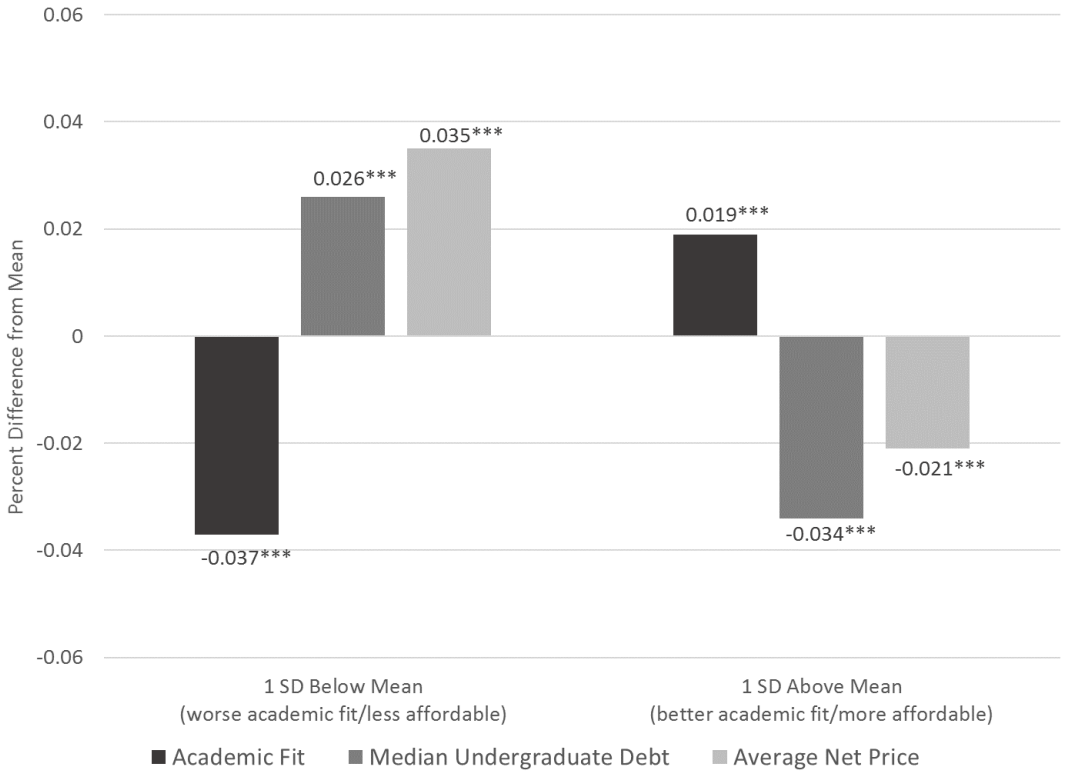
Sources: College Board and TransUnion Credit Bureau data.

Figure 4. Estimated annual income 13 years after college entry by academic fit and SAT score quartile, under-represented minority (URM) status, family income, and first-generation status



Notes: The sample is restricted to 2004 high school graduates who took the SAT and enrolled in college within 6 months of high school completion. Predicted values are estimated from models as specified in equation (1). See Tables 3-6 for student subgroup definitions. Sources: College Board and TransUnion Credit Bureau data.

Figure 5. Estimated differences in annual income 13 years after college entry by changes in academic fit, median undergraduate debt, and average net price



*** p<0.01

Notes: The sample is restricted to 2004 high school graduates who took the SAT, enrolled in college within 6 months of high school completion, and attended an institution with median debt information reported in the College Scorecard dataset. Academic fit is defined as the median SAT score at each student's first college attended minus the student's own SAT score. Median undergraduate debt is assigned to each student using institution-by-income median debt amounts reported in the College Scorecard. Average net price is assigned to each student using 2006-07 average net price amounts reported in IPEDS deflated to 2004-05 values using sector-specific average net price growth rates. Median debt and average net price are opposite signed so that +1 SD increment (-1 SD decrement) from the mean denotes a more (less) affordable institution in expectation. F-tests of equal effects between academic fit and median undergraduate debt and between academic fit and average net price are rejected at the p<.001 level.

Sources: College Board, TransUnion Credit Bureau, U.S. Department of Education's College Scorecard, and Integrated Postsecondary Education Data System (IPEDS) data.

Table 1. Summary statistics of the study sample

	Mean	SD
Student characteristics		
Female	0.547	0.498
White	0.661	0.473
Black	0.098	0.298
Latino	0.090	0.287
Asian	0.081	0.274
Other Race	0.040	0.195
Missing Race	0.029	0.169
Parent's Education: Less than HS	0.029	0.168
Parent's Education: High School	0.093	0.291
Parent's Education: Some College	0.145	0.352
Parent's Education: College Graduate	0.501	0.500
Parent's Education: Missing	0.233	0.423
Family Income < $40K	0.171	0.376
$40K <= Family Income < $80K	0.212	0.409
Family Income >= $80K	0.206	0.405
Missing Family Income	0.411	0.492
HS GPA	3.352	0.573
Missing HS GPA	0.035	0.183
SAT Total Score	1066.374	200.453
Number of SAT Score Sends	4.379	3.435
Mean of Median SAT Score at Colleges to which Scores Sent	921.062	454.707
SD of Median SAT Score at Colleges to which Scores Sent	68.108	61.412
Academic Fit & Financial Affordability Measures		
Academic Fit: College Median SAT Score Ptile – Student SAT Score Ptile	3.374	21.674
Median Undergraduate Debt (in $1000s)	10.893	5.208
Average Net Price (in $1000s)	15.341	8.431
Early-Career Outcomes		
Predicted Annual Income (in $1000s)	91.364	46.658
Total Debt (in $1000s)	117.461	164.269
Total Debt, excluding Education & Mortgage Debt (in $1000s)	15.201	25.125
Education Debt (in $1000s)	23.459	54.628
Pr(Loan Delinquency) w/in 12 Months	0.227	0.419
Pr(Credit Score >= 700)	0.613	0.487
Neighborhood Median Household Income (in $1000s)	75.881	34.355
Number of Students	953,109	

Notes: The sample is restricted to 2004 high school graduates who took the SAT, enrolled in college within 6 months of high school completion, and attended an institution with median debt information reported in the College Scorecard dataset.

Sources: College Board, TransUnion Credit Bureau, U.S. Department of Education's College Scorecard, and Integrated Postsecondary Education Data System (IPEDS) data.

Table 2. Predicted financial outcomes 13 years after college entry by academic fit (N = 953,109)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Academic fit: College median SAT score percentile minus student SAT score percentile							
Outcome	-30	-20	-10	0	10	20	30	R-Squared
Annual Income (in $1000s)	82.373	85.377	88.339	91.151	93.705	95.892	97.604	0.149
	(0.119)	(0.088)	(0.057)	(0.032)	(0.040)	(0.068)	(0.095)	
Total Debt (in $1000s)	101.452	107.172	112.541	117.436	121.730	125.300	128.021	0.052
	(0.419)	(0.315)	(0.207)	(0.114)	(0.141)	(0.243)	(0.340)	
Total Debt excluding Education	14.841	14.979	15.093	15.190	15.277	15.360	15.447	0.039
and Mortgage Debt (in $1000s)	(0.071)	(0.055)	(0.035)	(0.019)	(0.025)	(0.042)	(0.060)	
Education Debt (in $1000s)	20.734	21.437	22.228	23.084	23.979	24.890	25.792	0.060
	(0.149)	(0.109)	(0.072)	(0.040)	(0.049)	(0.083)	(0.119)	
Probability of Being Delinquent on	0.257	0.249	0.239	0.230	0.220	0.211	0.204	0.140
Loan Payment	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	
Probability of Credit Score ≥ 700	0.554	0.573	0.593	0.611	0.628	0.643	0.656	0.183
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	
Neighborhood Median Household	73.384	74.12	74.917	75.726	76.502	77.196	77.763	0.212
Income (in $1000s)	(0.083)	(0.063)	(0.043)	(0.024)	(0.027)	(0.048)	(0.069)	

Notes: The sample is restricted to 2004 high school graduates who took the SAT and enrolled in college within 6 months of high school completion. Each row reports predicted values from a separate regression that controls for the following student-level covariates: indicators for sex, race/ethnicity, level of parent's education, family income, and high school GPA, and a continuous measure of SAT score. All models also control for the number of institutions to which students sent their SAT scores, the mean and standard deviation of each college's median SAT score across all institutions to which students sent their SAT scores, and high school fixed effects. Standard errors, clustered by high school, are reported in parentheses. We reject that predicted values are equivalent across all outcomes at the p<.001 level.

Sources: College Board and TransUnion Credit Bureau data.

Table 3. Estimated differences in financial outcomes 13 years after college entry by academic fit and SAT quartile (N = 953,109)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Percent difference from baseline					
	Baseline academic fit = -10		Academic fit = -20		Academic fit = 0		Academic fit = +10	
Outcome	SAT Q2	SAT Q4	SAT Q2	SAT Q4	SAT Q2	SAT Q4	SAT Q2	SAT Q4
Annual Income	82.55	103.90	-0.021***	-0.039***	0.027***	0.041***	0.058***	0.080***
			(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
			[<0.001]		[<0.001]		[<0.001]	
Total Debt	104.00	135.40	-0.028***	-0.048***	0.041***	0.048***	0.087***	0.094***
			(0.005)	(0.003)	(0.003)	(0.003)	(0.005)	(0.008)
			[<0.001]		[0.077]		[0.448]	
Total Debt excluding Education and Mortgage Debt	16.51	12.68	-0.005	0.003	0.005*	0.005	0.011**	0.025***
			(0.006)	(0.004)	(0.003)	(0.004)	(0.006)	(0.009)
			[0.281]		[0.927]		[0.207]	
Education Debt	18.75	28.75	-0.069***	-0.022***	0.062***	0.035***	0.119***	0.089***
			(0.010)	(0.004)	(0.005)	(0.005)	(0.009)	(0.013)
			[<0.001]		[<0.001]		[0.061]	
Probability of Being Delinquent on Loan Payment	0.28	0.12	0.016***	0.084***	-0.026***	-0.080***	-0.060***	-0.151***
			(0.006)	(0.006)	(0.003)	(0.006)	(0.005)	(0.014)
			[<0.001]		[<0.001]		[<0.001]	
Probability of Credit Score ≥ 700	0.53	0.77	-0.025***	-0.028***	0.033***	0.026***	0.069***	0.046***
			(0.003)	(0.001)	(0.002)	(0.001)	(0.003)	(0.003)
			[0.383]		[0.001		[<0.001]	
Neighborhood Median Household Income	73.70	79.09	-0.005***	-0.015***	0.007***	0.016***	0.014***	0.034***
			(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
			[<0.001]		[<0.001]		[<0.001]	

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT and enrolled in college within 6 months of high school completion. Academic fit is defined as the median SAT score at the first college each student attended minus the student's own SAT score. SAT Q2 scores range from 910-1040; SAT Q4 scores range from 1200-1600. Columns (1) and (2) report predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (3)-(8) report estimated differences as a percent change relative to the values reported in columns (1) and (2). See notes in table 2 for model specification details. Standard errors, clustered by high school, are reported in parentheses. P-values from F-tests of equal effects are reported in brackets.

Sources: College Board and TransUnion Credit Bureau data.

Table 4. Estimated differences in financial outcomes 13 years after college entry by academic fit and underrepresented minority status (N = 925,146)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Percent difference from baseline					
	Baseline academic fit = -10		Academic fit = -20		Academic fit = 0		Academic fit = +10	
Outcome	Non-URM	URM	Non-URM	URM	Non-URM	URM	Non-URM	URM
Annual Income	92.82	75.45	-0.034***	-0.027***	0.032***	0.025***	0.062***	0.048***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
			[<.001]		[<.001]		[<.001]	
Total Debt	119.00	94.91	-0.049***	-0.035***	0.045***	0.032***	0.084***	0.060***
			(0.001)	(0.003)	(0.002)	(0.003)	(0.003)	(0.005)
			[<.001]		[<.001]		[<.001]	
Total Debt excluding Education and Mortgage Debt	15.11	15.30	-0.012***	0.015***	0.012***	-0.015***	0.022***	-0.027***
			(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.006)
			[<.001]		[<.001]		[<.001]	
Education Debt	20.19	29.47	-0.037***	-0.037***	0.039***	0.041***	0.079***	0.083***
			(0.003)	(0.004)	(0.003)	(0.004)	(0.006)	(0.007)
			[0.993]		[0.787]		[0.601]	
Probability of Being Delinquent on Loan Payment	0.19	0.39	0.054***	0.011***	-0.055***	-0.012***	-0.111***	-0.024***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
			[<.001]		[<.001]		[<.001]	
Probability of Credit Score ≥ 700	0.66	0.39	-0.030***	-0.035***	0.029***	0.032***	0.057***	0.061***
			(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.004)
			[0.032]		[0.179]		[0.359]	
Neighborhood Median Household Income	76.45	70.17	-0.011***	-0.006***	0.012***	0.006***	0.023***	0.013***
			(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
			[<.001]		[<.001]		[<.001]	

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT, reported their race/ethnicity, and enrolled in college within 6 months of high school completion. Academic fit is defined as the median SAT score at the first college each student attended minus the student's own SAT score. Under-represented minority (URM) is defined as non-White or non-Asian students. Columns (1) and (2) report predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (3)-(8) report estimated differences as a percent change relative to the values reported in columns (1) and (2). See notes in table 2 for model specification details. Standard errors, clustered by high school, are reported in parentheses. P-values from F-tests of equal effects for URM and non-URM students are reported in brackets.

Sources: College Board and TransUnion Credit Bureau data.

Table 5. Estimated differences in financial outcomes 13 years after college entry by academic fit and family income (N = 561,503)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Percent difference from baseline					
	Baseline academic fit = -10		Academic fit = -20		Academic fit = 0		Academic fit = +10	
Outcome	Low-Income	High-Income	Low-Income	High-Income	Low-Income	High-Income	Low-Income	High-Income
Annual Income	75.84	95.17	-0.031***	-0.032***	0.030***	0.030***	0.057***	0.057***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
			[0.697]		[0.720]		[0.880]	
Total Debt	93.97	125.10	-0.043***	-0.046***	0.038***	0.044***	0.072***	0.083***
			(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.005)
			[0.306]		[0.116]		[0.146]	
Total Debt excluding Education and Mortgage Debt	15.33	15.62	0.004	-0.010**	-0.007**	0.009**	-0.015**	0.020**
			(0.003)	(0.004)	(0.003)	(0.005)	(0.006)	(0.009)
			[0.007]		[0.002]		[<0.001]	
Education Debt	25.00	21.67	-0.043***	-0.028***	0.044***	0.034***	0.090***	0.071***
			(0.005)	(0.005)	(0.004)	(0.005)	(0.009)	(0.010)
			[0.010]		[0.087]		[0.111]	
Probability of Being Delinquent on Loan Payment	0.35	0.19	0.017***	0.056***	-0.018***	-0.062***	-0.035***	-0.128***
			(0.002)	(0.004)	(0.002)	(0.004)	(0.005)	(0.007)
			[<0.001]		[<0.001]		[<0.001]	
Probability of Credit Score ≥ 700	0.44	0.66	-0.037***	-0.030***	0.035***	0.029***	0.068***	0.058***
			(0.002)	(0.001)	(0.002)	(0.001)	(0.004)	(0.003)
			[0.003]		[0.011]		[0.025]	
Neighborhood Median Household Income	68.69	75.96	-0.007***	-0.013***	0.007***	0.014***	0.013***	0.028***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
			[<0.001]		[<0.001]		[<0.001]	

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT, reported family income, and enrolled in college within 6 months of high school completion. Academic fit is defined as the median SAT score at the first college each student attended minus the student's own SAT score. Low-income is defined as family income below $40K; high-income is defined as family income of $80K or more. Columns (1) and (2) report predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (3)-(8) report estimated differences as a percent change relative to the values reported in columns (1) and (2). See notes in table 2 for model specification details. Standard errors, clustered by high school, are reported in parentheses. P-values from F-tests of equal effects for low-income and high-income students are reported in brackets. Sources: College Board and TransUnion Credit Bureau data.

Table 6. Estimated differences in financial outcomes 13 years after college entry by academic fit and first-generation status (N = 731,182)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Baseline academic fit = -10		Percent difference from baseline					
			Academic fit = -20		Academic fit = 0		Academic fit = +10	
Outcome	Not First-Gen	First-Gen	Not First-Gen	First-Gen	Not First-Gen	First-Gen	Not First-Gen	First-Gen
Annual Income	91.00	80.21	-0.032***	-0.032***	0.030***	0.030***	0.058***	0.057***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
			[0.697]		[0.645]		[0.604]	
Total Debt	116.90	102.40	-0.047***	-0.044***	0.043***	0.039***	0.080***	0.072***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.005)
			[0.280]		[0.084]		[0.094]	
Total Debt excluding Education and Mortgage Debt	14.66	16.73	-0.009***	-0.003	0.008***	-0.001	0.016***	-0.006
			(0.002)	(0.002)	(0.003)	(0.002)	(0.005)	(0.005)
			[0.049]		[0.002]		[<0.001]	
Education Debt	23.22	21.36	-0.037***	-0.048***	0.042***	0.048***	0.086***	0.096***
			(0.003)	(0.004)	(0.003)	(0.004)	(0.006)	(0.008)
			[0.009]		[0.135]		[0.256]	
Probability of Being Delinquent on Loan Payment	0.21	0.32	0.041***	0.027***	-0.044***	-0.026***	-0.090***	-0.049***
			(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
			[<0.001]		[<0.001]		[<0.001]	
Probability of Credit Score ≥ 700	0.63	0.48	-0.028***	-0.036***	0.028***	0.034***	0.054***	0.065***
			(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
			[<0.001]		[<0.001]		[<0.001]	
Neighborhood Median Household Income	75.15	70.76	-0.011***	-0.009***	0.012***	0.008***	0.023***	0.016***
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
			[<0.001]		[<0.001]		[<0.001]	

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT, reported their parent's education level, and enrolled in college within 6 months of high school completion. Academic fit is defined as the median SAT score at the first college each student attended minus the student's own SAT score. First-generation status is defined as students with parents who did not earn a college degree. Columns (1) and (2) report predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (3)-(8) report estimated differences as a percent change relative to the values reported in columns (1) and (2). See notes in table 2 for model specification details. Standard errors, clustered by high school, are reported in parentheses. P-values from F-tests of equal effects for first-gen and non-first-gen students are reported in brackets. Sources: College Board and TransUnion Credit Bureau data.

Table 7. Estimated differences in financial outcomes 13 years after college entry by academic fit vs. median undergraduate debt (N = 926,419)

	(1)	(2)	(3)	(4)	(5)
		Percent difference			
		-1 SD deviation from mean		+1 SD deviation from mean	
Outcome	Predicted value at mean	Academic Fit	Estimated Undergraduate Debt	Academic Fit	Estimated Undergraduate Debt
Annual Income	92.71	-0.037***	0.026***	0.019***	-0.034***
		(0.001)	(0.002)	(0.001)	(0.002)
Total Debt	120.30	-0.052***	0.039***	0.016***	-0.048***
		(0.004)	(0.005)	(0.003)	(0.006)
Total Debt excluding Education and Mortgage Debt	15.18	-0.021***	-0.025***	0.016***	0.022***
		(0.005)	(0.005)	(0.004)	(0.008)
Education Debt	24.90	0.020***	0.045***	-0.036***	-0.139***
		(0.006)	(0.007)	(0.006)	(0.008)
Probability of Being Delinquent on Loan Payment	0.23	0.107***	-0.031***	-0.101***	0.021***
		(0.005)	(0.005)	(0.005)	(0.008)
Probability of Credit Score ≥ 700	0.62	-0.056***	0.024***	0.043***	-0.023***
		(0.002)	(0.002)	(0.002)	(0.003)
Neighborhood Median Household Income	76.32	-0.021***	0.005***	0.016***	-0.008***
		(0.001)	(0.001)	(0.001)	(0.002)

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT, enrolled in college within 6 months of high school completion, and attended an institution with median debt information reported in the College Scorecard dataset. Academic fit is defined as the median SAT score at each student's first college attended minus the student's own SAT score. Median undergraduate debt is assigned to each student using institution-by-income median debt amounts reported in the College Scorecard and is opposite-signed so that +1 SD increment (-1 SD decrement) from the mean denotes a lower (higher) expected debt burden. Column (1) reports predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (2)-(5) report estimated differences as a percent change relative to the values in column (1). All estimates are from models that include the covariates listed in Table 2 and selectivity tier fixed effects. Standard errors, clustered by high school, are reported in parentheses. Except for the effects on total debt excluding education and mortgage debt, which are not rejected as equal, F-tests of equal effects on academic fit and median undergraduate debt are rejected across all outcomes at the p<.05 level.

Sources: College Board, TransUnion Credit Bureau, and U.S. Department of Education College Scorecard data.

Table 8. Estimated differences in financial outcomes 13 years after college entry by academic fit vs. average net price (N = 936,655)

	(1)	(2)	(3)	(4)	(5)
		Percent difference			
		-1 SD deviation from mean		+1 SD deviation from mean	
Outcome	Predicted value at mean	Academic Fit	Average Net Price	Academic Fit	Average Net Price
Annual Income	91.75	-0.041***	0.035***	0.026***	-0.021***
		(0.001)	(0.002)	(0.001)	(0.002)
Total Debt	118.90	-0.059***	0.033***	0.030***	-0.017***
		(0.003)	(0.005)	(0.003)	(0.006)
Total Debt excluding Education and Mortgage Debt	14.98	-0.017***	0.003	0.017***	0.032***
		(0.004)	(0.006)	(0.004)	(0.007)
Education Debt	24.21	0.018***	0.067***	-0.018***	-0.127***
		(0.006)	(0.008)	(0.006)	(0.009)
Probability of Being Delinquent on Loan Payment	0.23	0.116***	0.008	-0.110***	-0.034***
		(0.005)	(0.005)	(0.004)	(0.008)
Probability of Credit Score $\geq$ 700	0.62	-0.062***	0.004	0.050***	0.001
		(0.002)	(0.002)	(0.002)	(0.003)
Neighborhood Median Household Income	76.07	-0.021***	0.008***	0.018***	-0.005**
		(0.001)	(0.002)	(0.001)	(0.002)

*** p<0.01, ** p<0.05, * p<0.1

Notes: The sample is restricted to 2004 high school graduates who took the SAT, enrolled in college within 6 months of high school completion, and attended a public or private, non-profit institution with average net price in 2006-07 reported in IPEDS. Academic fit is defined as the median SAT score at each student's first college attended minus the student's own SAT score. Average net price is assigned to each student based on their first institution attended using 2006-07 average net price amounts reported in IPEDS, deflated to 2004-05 values using sector-specific average net price growth rates, and opposite-signed so that +1 SD increment (-1 SD decrement) from the mean denotes lower (higher) average net price. Column (1) reports predicted outcome values evaluated at the means of all covariates in level ($1,000s or percentage point) increments. Columns (2)-(5) report estimated differences as a percent change relative to the values in column (1). All estimates are from models that include the covariates listed in Table 2 and selectivity tier fixed effects. Standard errors, clustered by high school, are reported in parentheses. F-tests of equal effects on academic fit and average net price are rejected across all outcomes at the p<.05 level.

Sources: College Board, TransUnion Credit Bureau, and Integrated Postsecondary Education Database System (IPEDS) data.