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Decreasing time to baccalaureate degree in the United States

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ABSTRACT

After increasing in the 1970s and 1980s, time to bachelor's degree has declined since the 1990s. We document this fact using data from three nationally representative surveys. We show that this pattern is occurring across school types and for all student types. Using administrative student records from 10 large universities, we confirm the finding and show that it is robust to alternative sample definitions. We discuss what might explain the decline in time to bachelor's degree by considering trends in student preparation, state funding, student enrollment, study time, and student employment during college.

1. Introduction

Attending and completing college has many benefits such as higher labor market earnings and lower probability of unemployment (Barrow & Malamud, 2015; Oreopoulos & Salvanes, 2011). However, there are also costs to attending college including tuition, psychic costs, and foregone earnings. Conditional on receiving a degree, spending less time in college results in lower costs.

In an influential paper, Bound et al. (2012) documented an important fact: time to baccalaureate degree was *increasing* from the 1970s to the 1990s. We document a new fact: since the 1990s, time to baccalaureate degree has been decreasing–the previously established trend in time to completion of bachelor's degrees has reversed. Moreover, we find decreasing time to degree across all school types and across different student demographics.[1]

We discuss a few potential explanations for this change. We rely heavily on findings from Denning et al. (2022) and discuss how changes in student preparation, student enrollment patterns, state funding for higher education, student employment during college, and study time could collectively predict declining time to degree.

2. Data

We primarily use the Baccalaureate and Beyond (B&B) 1993, 2000, and 2008 to document this fact. These surveys, collected by the National Center for Education Statistics, are designed to be nationally representative and follow students who received a bachelor's degree and gather information on their subsequent labor force and other outcomes. The first B&B tracks the experiences of a cohort of college graduates who received the baccalaureate degree during the 1992–1993 academic year and were first interviewed as part of the National Postsecondary Student Aid Study (NPSAS). Similarly, the second survey follows the 1999–2000 cohort, and the third follows the 2007–2008 cohort, each taken from the NPSAS cohort. In each of these surveys, extensive information is available on students' postsecondary educational and labor market experiences, including detailed financial aid information.[2] We make sample restrictions similar to Bound et al. (2012) to aid in comparability to their paper. Namely, students must go to college within two years of graduating high school, and students who receive a bachelor's degree within eight years of graduating high school.[3] We relax these restrictions later in the paper to determine the robustness of our main result. When using date variables such as high school graduation date, college start date,

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[1] We also note that a companion paper, Denning et al. (2022) documents that college graduation rates are increasing over this time frame. This represents a similar reversal of the trend from the 1970s to 1990s as documented in Bound et al.(2010).

[2] Each of these surveys have follow ups. The 1993 and 2008 surveys have three follow ups, one, four, and ten years after graduation respectively, while the 2000 survey only has only one follow up that was a year after graduation. Throughout our analysis we use the same restrictions for each survey.

[3] We have data on students who start at two- and four-year colleges, but as the results are largely the same, we choose to restrict our sample to those who started at a four-year college.

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Table 1
Eight year time to degree distributions for the full B&B sample and by college selectivity.

	TTD Distribution				Mean	HS	Mean	
	4	5	6	7	TTD	Lag	Credits	N
Full Sample								
B&B 1993	0.441	0.774	0.909	0.964	4.90	3.25	132.5	6790
B&B 2000	0.523	0.826	0.926	0.973	4.73	–	–	6130
B&B 2008	0.580	0.838	0.932	0.975	4.66	3.12	128.7	8610
P-Value					0.000		0.000	
Full Sample T-tests					***P*-value**			
1993=2000					0.000			
1993=2008					0.000			
2000=2008					0.000			
Public Not Top 50								
B&B 1993	0.307	0.692	0.878	0.953	5.16	3.27	134.6	3050
B&B 2000	0.355	0.736	0.886	0.958	5.05	–	–	2680
B&B 2008	0.428	0.761	0.901	0.961	4.93	3.18	132.0	3560
P-Value					0.000		0.001	
Public Top 50								
B&B 1993	0.430	0.825	0.943	0.981	4.81	3.12	135.4	1370
B&B 2000	0.542	0.879	0.961	0.984	4.61	–	–	1030
B&B 2008	0.637	0.890	0.957	0.987	4.51	2.98	130.1	1350
P-Value					0.000		0.000	
Private Less Selective								
B&B 1993	0.593	0.837	0.921	0.963	4.68	3.31	125.9	1470
B&B 2000	0.654	0.883	0.946	0.983	4.52	–	–	1620
B&B 2008	0.707	0.891	0.953	0.985	4.44	3.17	125.0	2620
P-Value					0.000		0.441	
Private Highly Selective								
B&B 1993	0.737	0.904	0.954	0.979	4.42	3.19	130.2	870
B&B 2000	0.758	0.904	0.951	0.984	4.39	–	–	780
B&B 2008	0.784	0.933	0.964	0.987	4.31	2.98	122.5	1010
P-Value					0.024		0.000	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. Sample consists of students that go to college within two years of graduating high school and receive a bachelor's degree within eight years of graduating high school. The four TTD Distribution columns show the proportion of graduates who earn their degree within 4, 5, 6, and 7 years. The Mean TTD is the average time to degree in years. The HS Lag column reports the average number of months between high school graduation and cohort high school graduation. Sample sizes are rounded to the nearest 10 per the data use agreement.

and bachelor's degree date, we convert the date into a school year, by rounding the year up by one if these events happened after August. Once all these variables are in school years, simple subtraction gives us both a time to degree variable and a time between high school and college variable. We use the provided survey weights to yield nationally representative statistics.

We also consider different types of schools separately. We follow the convention of Bound et al. (2010) for comparability. The categories include: top 50 public, non-top 50 public, highly selective private, and less selective private. We assign the highest rated 50 public schools to the "top 50 public" category. The 65 highest rated private universities, the 50 highest rated liberal arts colleges, and the armed service academies are categorized as "highly selective private".[4] We use the 2005 U.S. News and World Report rankings to aid in comparability to Bound et al. (2010).[5] Other 4-year public schools are assigned to the "non-top 50 public" category, and other 4-year not-for-profit private schools are assigned to the "less selective private" category.

We supplement the nationally representative B&B data with administrative student data from 10 public universities which we call the State School Sample.[6] These data were obtained from schools' registrars through the MIDFIELD partnership.[7] While these universities are not nationally representative, they offer several advantages. First, we can confirm the trends in the B&B data with more detailed longitudinal student data for over 225,000 college graduates. Second, we can use an alternative sample definition, looking at time to degree by the year the student started college rather than by graduation year. Third, we have pre-college student performance and can confirm if the decline in time to degree holds for students in different performance groups and by age at college entrance. In the State School Sample, to calculate time to degree we use a student's year of entry at the college that they graduate from because we do not observe high school graduation.

Again, following the convention of Bound et al. (2010), the State School sample includes only those students who graduated from one of the 10 universities within eight years of first starting at the university.

3. Trends in time to degree

Table 1 documents the main results for our paper. Each row in the top panel is a separate Baccalaureate and Beyond survey for all schools in our sample. This table presents information on students who

[4] Service academies are publicly funded but resemble liberal arts colleges along many dimensions including academic ability of students and class size. This follows the convention of Bound, Lovenheim, and Turner (2010, 2012).

[5] U.S. News rankings are quite stable over time.

[6] The universities included are Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, Georgia Tech, North Carolina State, Purdue, and Virginia Tech.

[7] Institutions that participate in the MIDFIELD partnership share de-identified longitudinal student record data for all degree-seeking undergraduate students. The data includes demographic and admissions information as well as course grades and degree earned.

Table 2
Eight year time to degree distributions for the B&B sample by race, gender, pell status.

	TTD Distribution				Mean	HS	
	4	**5**	**6**	**7**	**TTD**	**Lag**	**N**
White							
B&B 1993	0.454	0.783	0.913	0.966	4.87	3.26	5790
B&B 2000	0.541	0.849	0.938	0.978	4.68	–	4910
B&B 2008	0.605	0.852	0.937	0.977	4.61	3.10	6390
P-Value					0.000		
Hispanic							
B&B 1993	0.304	0.699	0.843	0.933	5.21	3.24	310
B&B 2000	0.438	0.692	0.860	0.944	5.05	–	380
B&B 2008	0.469	0.780	0.916	0.974	4.84	2.97	670
P-Value					0.000		
Black							
B&B 1993	0.358	0.725	0.888	0.957	5.07	2.98	350
B&B 2000	0.410	0.755	0.880	0.969	4.97	–	420
B&B 2008	0.481	0.780	0.901	0.954	4.86	3.33	650
P-Value					0.023		
Male							
B&B 1993	0.371	0.726	0.894	0.960	5.05	3.39	2960
B&B 2000	0.463	0.795	0.920	0.975	4.83	–	2350
B&B 2008	0.516	0.808	0.918	0.970	4.77	3.20	3530
P-Value					0.000		
Female							
B&B 1993	0.498	0.813	0.921	0.967	4.79	3.13	3830
B&B 2000	0.568	0.848	0.930	0.972	4.66	–	3790
B&B 2008	0.627	0.860	0.942	0.978	4.57	3.06	5080
P-Value					0.000		
No Pell Grant							
B&B 1993	0.460	0.788	0.923	0.969	4.85	3.16	5410
B&B 2000	0.552	0.857	0.945	0.979	4.65	–	4920
B&B 2008	0.615	0.867	0.948	0.981	4.57	3.10	5390
P-Value					0.000		
Pell Grant							
B&B 1993	0.335	0.696	0.832	0.934	5.20	3.76	1390
B&B 2000	0.396	0.688	0.842	0.947	5.12	–	1210
B&B 2008	0.427	0.712	0.863	0.947	5.04	3.24	3230
P-Value					0.000		
Non-Transfers							
B&B 1993	0.365	0.706	0.873	0.949	5.10	3.30	3820
B&B 2000	0.435	0.739	0.878	0.951	4.98	–	2330
B&B 2008	0.493	0.762	0.892	0.959	4.88	3.06	3370
P-Value					0.000		
Transfer Students							
B&B 1993	0.533	0.856	0.952	0.982	4.67	3.19	2970
B&B 2000	0.576	0.877	0.954	0.987	4.59	–	3800
B&B 2008	0.633	0.884	0.956	0.984	4.52	3.16	5240
P-Value					0.000		

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. Uses the same sample and definitions as Table 1. Sample sizes are rounded to the nearest 10 per the data use agreement.

ultimately receive a bachelor's degree within 8 years of high school graduation following the definition in Bound et al. (2012). We show that results are similar when using college entry as the starting point as a robustness check (see Table A1). The first four columns show the proportion of eventual graduates who earn their degree within 4, 5, 6, and 7 years. The first column shows that the fraction of students graduating within 4 years from entry increased from 44% in 1993 to 58% in 2008. In contrast, the probability of receiving a degree in exactly 5 years or exactly 6 years declined. For example, the probability of graduating in exactly 5 years fell from 0.33 (0.77 - 0.44) in 1993 to 0.26 (0.84 - 0.58) in 2008; the comparable numbers for exactly 6 years are 0.14 in 1993 and 0.09 in 2008.

Another summary measure presented in the fifth column and labeled the Mean TTD is the average time to degree in years. This started at 4.90 in 1993 and fell to 4.66 in 2008. The next panel of Table 1 shows p-values from t-tests for differences in average time to degree across survey years, and we see that the differences are significant at the 1% level in each case. These results summarize the main finding of our paper, which is that average time to degree decreased starting in the 1990s.

In Bound et al. (2012), they found that time to degree increased from 4.48 to 4.81 years from NLS72 to NELS:88 (high school class of 1992). We found a decline from 4.9 years to 4.66 for the college graduating classes of 1993 to 2008. A few things are notable. First, we have very similar estimates for time to degree in our samples within the closest time range (4.9 for the high school class of 1992 and 4.81 for the college class of 1993). Second, we observe that time to degree declined from 1993 to 2008 about three-fourths as much as it increased from 1972 to 1992. In other words, the increase in time to degree documented in Bound et al. (2012) has almost entirely been erased by 2008.

We also compute a measure of how long after high school graduation students began college. This is in the column labeled HS Lag and is measured in months. This does not seem to have changed much over the time frame, but we are unable to compute this for the 2000 cohort.

Table 1 also reports the total number of credits completed over time. Time to degree could be falling because students are taking fewer credits to graduate. Indeed, this is what we find with total credits declining from 132.5 in the 1993 B&B to 128.7 in the 2008 B&B. We are unable to compute this statistic for the 2000 B&B.

We next examine whether time to degree varies by school type and report the results in the bottom panels of Table 1. We find a remarkably

Table 3
Eight year time to degree distributions for the State School sample by college start.

	TTD Distribution				*Mean*	*Credits*	
	4	**5**	**6**	**7**	**TTD**	**Earned**	**N**
Graduation Year							
1996	0.570	0.898	0.973	0.993	4.31	119.7	24,788
1997	0.564	0.898	0.973	0.991	4.33	119.7	25,136
1998	0.577	0.892	0.973	0.993	4.32	119.0	27,105
1999	0.588	0.908	0.976	0.993	4.29	118.3	27,277
2000	0.591	0.906	0.974	0.992	4.30	117.7	28,022
2001	0.590	0.909	0.974	0.992	4.30	117.7	29,969
2002	0.596	0.911	0.976	0.993	4.30	118.3	32,024
2003	0.609	0.911	0.973	0.992	4.29	118.7	34,507
College Entrance Year							
1990	0.547	0.889	0.969	0.990	4.35	120.1	23,873
1991	0.553	0.898	0.971	0.992	4.33	120.0	24,128
1992	0.561	0.891	0.969	0.991	4.33	120.4	23,672
1993	0.558	0.891	0.972	0.992	4.33	119.5	24,752
1994	0.573	0.897	0.973	0.991	4.31	119.2	25,404
1995	0.565	0.900	0.971	0.992	4.33	118.7	26,550
1996	0.594	0.901	0.972	0.992	4.30	118.3	27,283
1997	0.574	0.904	0.974	0.994	4.31	118.2	28,918
1998	0.580	0.914	0.983	0.996	4.30	118.3	29,814
1999	0.611	0.942	0.989	0.996	4.23	118.3	30,875
Top Quartile SAT Math by College Entrance Year							
1990	0.490	0.877	0.970	0.989	4.50	121.4	4716
1991	0.483	0.887	0.971	0.992	4.50	121.7	4895
1992	0.474	0.869	0.966	0.989	4.53	123.1	5220
1993	0.481	0.869	0.973	0.992	4.52	122.1	5490
1994	0.494	0.880	0.970	0.991	4.50	121.9	5631
1995	0.497	0.875	0.968	0.991	4.50	121.0	6263
1996	0.524	0.886	0.970	0.992	4.46	120.9	6447
1997	0.514	0.879	0.971	0.993	4.47	120.8	6850
1998	0.519	0.896	0.981	0.997	4.44	121.2	7394
1999	0.561	0.937	0.992	0.998	4.35	120.6	7765
Bottom Half SAT Math by College Entrance Year							
1990	0.506	0.882	0.966	0.990	4.44	120.7	10,189
1991	0.519	0.886	0.968	0.993	4.42	120.3	10,454
1992	0.540	0.888	0.967	0.991	4.40	120.7	9666
1993	0.521	0.887	0.969	0.991	4.42	119.3	10,290
1994	0.554	0.896	0.971	0.990	4.38	119.2	10,625
1995	0.539	0.900	0.970	0.991	4.40	119.0	11,007
1996	0.583	0.901	0.970	0.992	4.35	118.4	11,579
1997	0.555	0.907	0.974	0.994	4.36	118.4	12,005
1998	0.565	0.911	0.981	0.996	4.34	118.6	12,268
1999	0.596	0.937	0.986	0.994	4.28	118.9	13,172
Under Age 20 at College Entrance Year							
1990	0.519	0.884	0.968	0.990	4.42	121.8	17,881
1991	0.521	0.894	0.971	0.993	4.41	121.8	18,087
1992	0.526	0.885	0.970	0.991	4.42	122.6	17,617
1993	0.522	0.885	0.972	0.992	4.42	121.8	18,350
1994	0.535	0.890	0.972	0.992	4.40	121.6	19,208
1995	0.531	0.893	0.971	0.991	4.41	120.9	20,262
1996	0.558	0.897	0.971	0.992	4.38	120.6	20,988
1997	0.542	0.898	0.974	0.994	4.39	120.5	22,023
1998	0.547	0.907	0.981	0.996	4.37	120.9	23,056
1999	0.581	0.935	0.988	0.996	4.31	120.7	24,130
Age 20 or older at College Entrance Year							
1990	0.632	0.906	0.970	0.990	4.14	115.1	5992
1991	0.649	0.910	0.971	0.991	4.10	114.5	6041
1992	0.661	0.908	0.969	0.990	4.09	114.0	6055
1993	0.661	0.906	0.970	0.991	4.09	112.8	6402
1994	0.689	0.918	0.975	0.990	4.04	111.9	6196
1995	0.676	0.922	0.970	0.993	4.08	111.6	6288
1996	0.714	0.915	0.975	0.991	4.04	110.6	6295
1997	0.675	0.921	0.975	0.995	4.08	110.9	6895
1998	0.696	0.936	0.988	0.997	4.04	109.6	6758
1999	0.718	0.967	0.993	0.997	3.97	109.5	6745

SOURCE: Sample consists of students who receive a bachelor's degree within eight years of starting college at Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, Georgia Tech, North Carolina A&T, North Carolina State, Purdue, and Virginia Tech. The four TTD Distribution columns show the proportion of graduates who earn their degree within 4, 5, 6, and 7 years. The Mean TTD is the average time to degree in years for this sample. Top Quartile is defined as students with an SAT math score of 640 or above while Bottom Half is defined as an SAT math score of 580 or below.

Table 4
Sample averages.

	B&B 1993	B&B 2000	B&B 2008
Asian or Pacific Islander	0.039	0.068	0.068
Black	0.050	0.075	0.069
Hispanic	0.044	0.076	0.069
White	0.856	0.765	0.767
Female	0.549	0.572	0.575
Pell	0.155	0.185	0.187
Transfer	0.563	0.380	0.391
Age at Beginning of Survey Year	23.2	23.2	23.0
Public Not Top 50	0.460	0.405	0.436
Public Top 50	0.223	0.213	0.189
Private Less Selective	0.191	0.247	0.246
Private Highly Selective	0.119	0.132	0.123

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. See the text for details about sample construction. Sample sizes are rounded to the nearest 10 per the data use agreement.

consistent pattern across all school types. Average time to degree fell at public institutions, going from 5.16 to 4.93 years at non-top 50 publics and from 4.81 to 4.51 years at top 50 publics. Average time to degree also fell at private universities, dropping from 4.68 to 4.44 years at less selective private schools, and declining from 4.42 to 4.31 at selective private schools.

Table 2 shows the trends by race/ethnicity, gender, transfer student status, and Pell Grant status. We use Pell Grant status defined as receiving a Pell Grant in the year a student graduates as a proxy for income. We see that there are differences in average time to degree across these groups of students. White students finish faster than Hispanic and Black students. Female students finish faster than male students. Students who do not receive the Pell Grant finish faster than students who do. Students who transfer finish faster than students who do not. Despite these differences in levels—the trend is similar for all groups. Time to degree is declining for White, Hispanic, and Black students. Similarly, time to degree is declining for male and female students, students who receive the Pell Grant versus students who do not, and transfer and non- transfer students.

We consider the robustness of our B&B results presented in Table 1 to alternative sample choices in Appendix Tables A1 and A2. In Table A1 we use college enrollment as the start of calculating time to degree. In Table A2 we use high school graduation as the starting date, but we remove the restriction that students must start college within 2 years of high school graduation. In this table we find that time to degree is declining from B&B 1993 to B&B 2000. However, we find a very similar time to degree from B&B 2000 to B&B 2008 and we cannot reject equality in 2000 and 2008.

In Table A3 we consider different windows of graduation. We consider time to degree for students graduating within 8, 10, 12, and 15 years from entry as well as no restriction on graduating within a window. We find that time to degree is declining irrespective of the length we allow students to graduate within. Our results are consistent across sample selection choices and definition of time to degree.

Table 3 uses the State School sample which has a similar distribution of time to degree as the B&B sample in schools ranked in the public top 50. We have fewer years available in the State School sample which results in smaller declines in total time to degree, but the patterns are very similar. The top panel shows that time to degree by graduation cohort shows a similar pattern to that reported in Table 1 with the fraction of students graduating in exactly 4 years increasing by 0.039 over the 7 reported graduation years. Average credits earned at the institution (excluding transfer and AP credit) also decline over this period.

The State School sample allows us to examine the distribution of the time to degree by college entrance year rather than by graduation year. The second panel of Table 3 shows that the average time to degree fell

from 4.35 for the 1990 entering cohort to 4.23 for the 1999 entering cohort. Appendix Figs. A1 and A2 show the average time to degree over time separately by school.[8]

The State School sample contains some pre-college achievement measures from the student's college application including the SAT math score.[9] The third and fourth panels of Table 3 report the distribution of time to degree for students in the Top Quartile which is defined as SAT math score above 640 and for students in the Bottom Half which is defined as SAT math score below 580. Time to degree is decreasing for both students in the top quartile and for students in the bottom half, though the decrease is slightly larger for students in the bottom half.

The bottom two panels of Table 3 shows that time to degree is falling both for students who are under age 20 when they enter one of the institutions in the State School sample and for those that are over age 20. About half the students who enter when they are over age 20 are transfer students who completed credits at another college before entering one of the colleges in our sample. When transfer students are excluded from the analysis, as reported in Table A4, the results show a similar decline in the time to degree. The number of credits at entrance, credits earned, and fraction of students who graduate from the State School sample are reported in Table A5.

In an additional exercise, we looked at the difference in time to degree between the Education Longitudinal Study of 2002 (ELS:2002) and the National Education Longitudinal Study of 1988 (NELS:88) as in Denning et al. (2022). We find a statistically insignificant change of 0.01 years from NELS:88 to ELS:2002. The timing of these datasets makes a direct comparison difficult. NELS:88 to ELS:2002 spans the high school graduating classes of 1992 to 2004 or roughly the college graduating classes of 1997 to 2009. This most closely corresponds to the 2000 and 2008 waves of B&B where we see a smaller decline in time to degree of 0.12 years relative to observed change between 1993 and 2000 B&B. The 95% confidence interval of the ELS:2002/NELS:88 difference is −0.06 years to 0.08. The ELS:2002/NELS:88 difference is consistent with a smaller decline in time to degree, or a modest increase given the level of precision afforded by these surveys. We view the combination of the State School sample and the B&B samples as providing compelling evidence of a decline in time to degree, while noting the imprecise estimates from a comparison of NELS:88 to ELS:2002.

4. Discussion

There are several possible explanations for why time to degree could change. Bound et al. (2012) discuss "supply side" and "demand side" factors. Supply side factors include things such as which schools students attended and school resources. Since we see declines in time to degree across all school types, school types that students attend cannot explain the decline. Moreover, Denning et al. (2022) document that student resources stagnated or slightly decreased over this time frame, which would predict increasing time to degree (Deming & Walter, 2017). The price of college has increased over this time frame which has an ambiguous prediction on time to degree (Collegeboard, 2017). Increasing price of college may increase the need to work in school thereby lengthening time to degree, or may incentivize students to finish faster (Denning, 2019; Garibaldi et al., 2012). Cohort size could also affect time to degree. We investigate this by regressing time to degree on the size of the entering class, institution fixed effects, student demographics and test scores, and credits at college entry using the State School sample. We find that increasing the entering cohort by 1000 people is correlated with a 0.014 year increase in time to degree. In the State School sample, the entering cohort size is increasing over time which would predict increasing time to degree. Hence, supply side factors are unlikely to describe the decline in time to degree. In fact, they would predict increasing time to degree.

Demand side factors could drive the decline in time to degree. For instance, students could be studying more, working less, or coming to college more prepared. However, Babcock & Marks (2011) document that students are studying less; Scott-Clayton (2012) documents that students are employed more while attending college; and Denning et al. (2022) argue that student preparation is not increasing because more students are attending college and performance on the National Assessment of Educational Progress (NAEP) among 17-year-olds is unchanged over this time period. Taken together, demand side factors suggest increasing time to degree.

Changes in student enrollment patterns such as where they attend college or their demographic characteristics could be driving changes in time to degree. Table 4 shows summary statistics for these enrollment patterns by survey wave. We do not see large changes in where students attend or in student demographic characteristics, which suggests that enrollment patterns and demographics are unlikely to explain the phenomenon.

The trends we have reviewed that seem to be the most likely candidates for explaining declines in time to degree suggest time to degree should be *increasing*. This mirrors the discussion and conclusion of Denning et al. (2022). Ideally, we could perform a decomposition exercise similar to Bound et al. (2012) to assess the extent to which the various supply-side and demand-side factors account for decreasing time to degree. However, this type of analysis requires data with measures of pre-college achievement, and unfortunately, this is not collected for all students in the Baccalaureate and Beyond.

Tables 1 and 3 document a decline in credits completed for graduating students. Table 1 shows that for nationally representative data credits earned declines from 132.5 to 128.7. This suggests that students may be more efficient in their choice of classes. That is, they are less likely to take classes that do not count toward their ultimate degree. This could happen through less switching of majors, more intensive advising on which class to take, or relaxing requirements to reduce remedial courses. Alternatively, schools may have changed credit requirements for degrees. These explanations are difficult to disentangle without precise information on degree requirements which we do not have in our data.

We are left with a puzzle because student study time, student employment, student preparation, funding for higher education, and school attended cannot explain the decrease in time to degree. This puzzle is similar to the puzzle of increasing college graduation rates over this time period as discussed in Denning et al. (2022), who propose that changing standards of degree receipt could explain the increase in college completion rates. Declining standards for degree receipt could explain decreasing time to degree as well.

However, because we lack suitable nationally-representative data for a decomposition we simply discuss relevant trends and possible explanations. We leave it to future research to understand the causes of the change in time to degree receipt.

5. Conclusion

This paper documents that since the 1990s, time to baccalaureate degree has been decreasing. This stands in contrast to the documented increase in time to degree in the 1970s and 1980s. We briefly discuss potential reasons for this decline. Several explanations seem unlikely to account for the change, including student time studying, student preparation, resources, and colleges attended. Future research should focus on exploring potential explanations for declining time to degree.

Appendix: Figures and Tables

[8] Our data use agreement does not permit associating school-specific statistics with the name of the institution.

[9] ACT math scores are converted into SAT math scores. For students who have both scores, we use the higher of the two. Data for the entering cohort year 1990 is dropped because of missing SAT scores at some institutions.

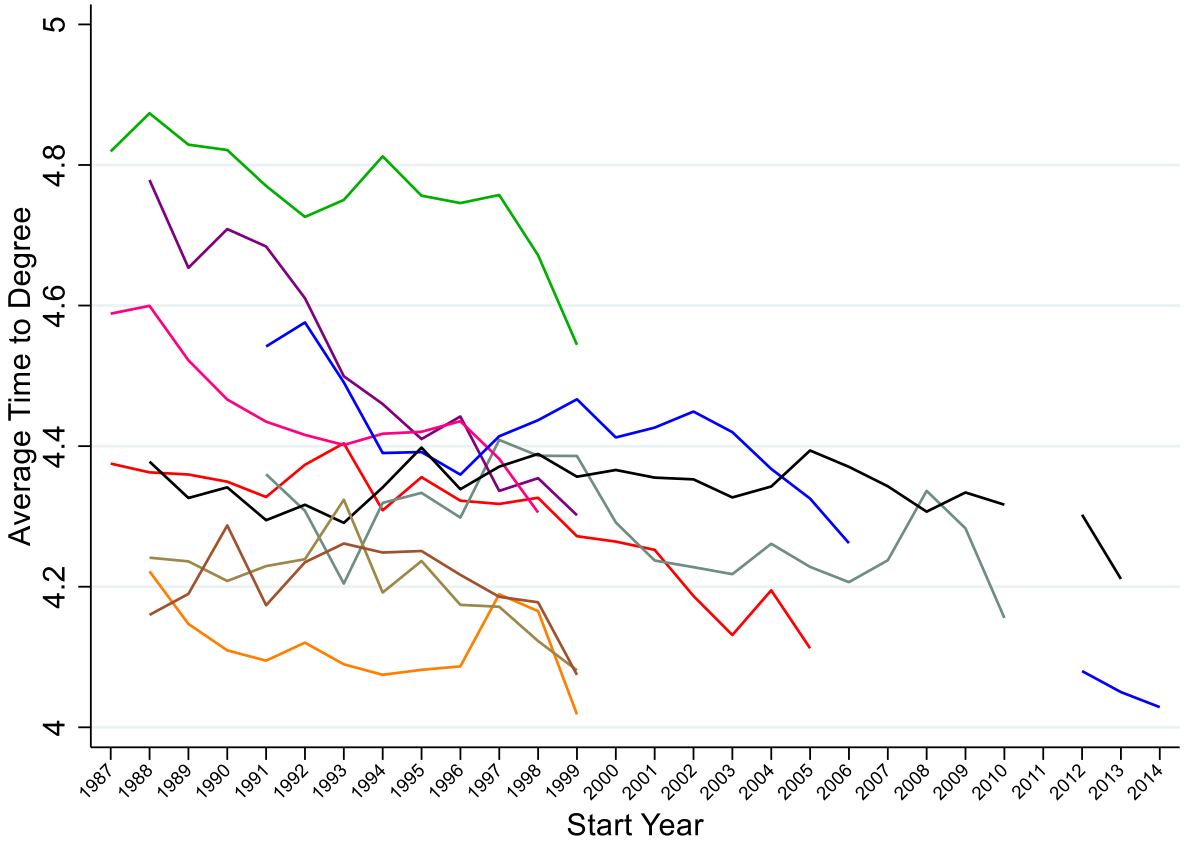

Fig. A1. Average Time to Degree by Institution by College Entering Cohort. SOURCE: Sample consists of students who receive a bachelor's degree within eight years of starting college at Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, Georgia Tech, North Carolina State, Purdue, and Virginia Tech. This sample includes transfer students. Each line represents a different school. The MIDFIELD data use agreement does not permit associating school-specific statistics with the name of the institution.

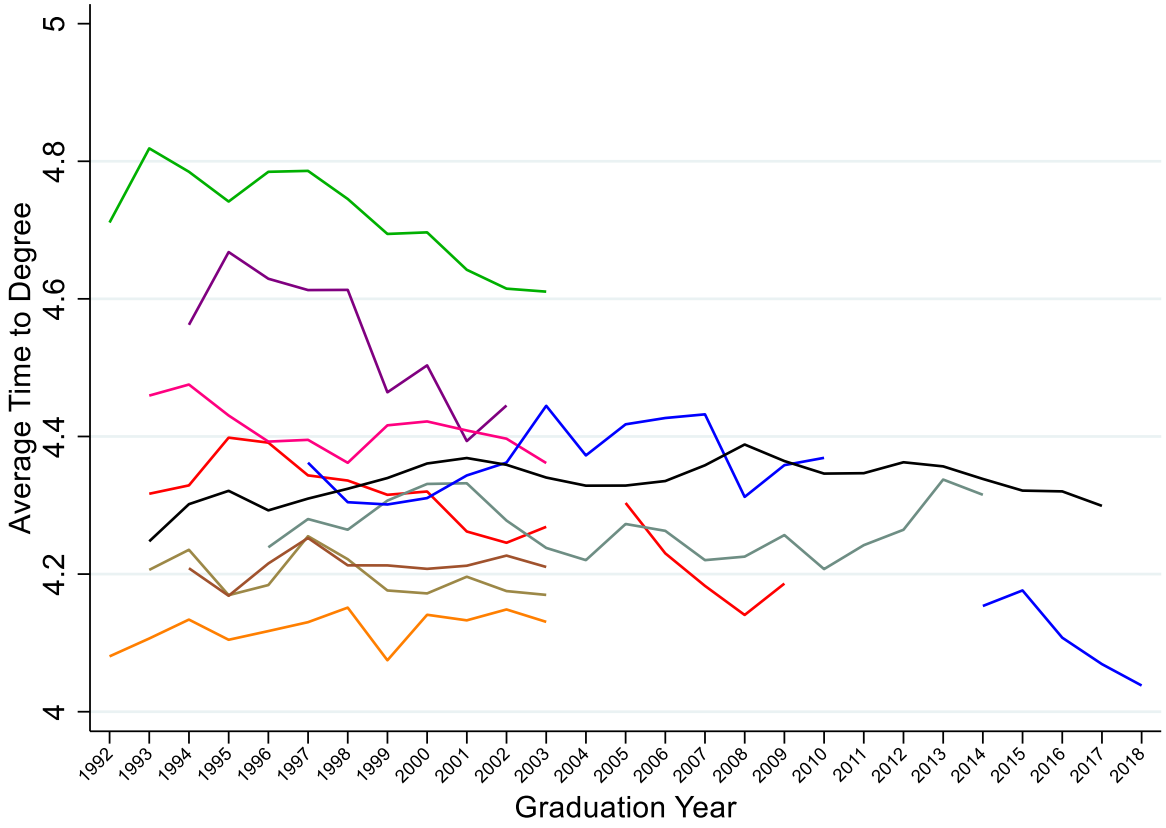

Fig. A2. Average Time to Degree by Institution by College Graduation Cohort. SOURCE: Sample consists of students who receive a bachelor's degree within eight years of starting college at Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, North Carolina A&T, North Carolina State, Purdue, and Virginia Tech. This sample includes transfer students. Each line represents a different school. The MIDFIELD data use agreement does not permit associating school-specific statistics with the name of the institution.

Table A1
Eight year time to degree distributions for the full B&B sample and by college selectivity using college entry instead of high school graduation.

	TTD Distribution				Mean	HS	
	4	5	6	7	TTD	Lag	N
Full Sample							
B&B 1993	0.449	0.780	0.917	0.967	4.88	3.21	6790
B&B 2000	0.542	0.835	0.931	0.976	4.69	–	6120
B&B 2008	0.589	0.844	0.933	0.977	4.64	3.10	8600
P-Value					0.000		
Full Sample T-tests					***P*-value**		
1993=2000					0.000		
1993=2008					0.000		
2000=2008					0.000		
Public Not Top 50							
B&B 1993	0.311	0.700	0.887	0.957	5.14	3.23	3050
B&B 2000	0.368	0.745	0.894	0.963	5.01	–	2680
B&B 2008	0.433	0.769	0.903	0.965	4.91	3.20	3560
P-Value					0.000		
Public Top 50							
B&B 1993	0.442	0.828	0.949	0.983	4.79	3.11	1360
B&B 2000	0.563	0.887	0.965	0.984	4.57	–	1040
B&B 2008	0.650	0.894	0.959	0.988	4.48	2.94	1350
P-Value					0.000		
Private Less Selective							
B&B 1993	0.603	0.846	0.926	0.966	4.66	3.27	1470
B&B 2000	0.681	0.898	0.951	0.984	4.47	–	1610
B&B 2008	0.722	0.900	0.955	0.983	4.41	3.10	2620
P-Value					0.000		
Private Highly Selective							
B&B 1993	0.755	0.909	0.959	0.980	4.38	3.11	870
B&B 2000	0.778	0.908	0.953	0.984	4.36	–	780
B&B 2008	0.792	0.936	0.963	0.990	4.30	2.93	1010
P-Value					0.088		

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. Sample consists of students that go to college within two years of graduating high school and receive a bachelor's degree within eight years of graduating high school. The four TTD Distribution columns show the proportion of graduates who earn their degree within 4, 5, 6, and 7 years. The Mean TTD is the average time to degree in years. The HS Lag column reports the average number of months between high school graduation and cohort high school graduation. Sample sizes are rounded to the nearest 10 per the data use agreement.

Table A2
Eight year time to degree distributions for the full B&B sample and by college selectivity with no restriction on starting college within 2 years of high school.

	TTD Distribution				Mean	HS	
	4	5	6	7	TTD	Lag	N
Full Sample							
B&B 1993	0.441	0.768	0.907	0.962	4.91	8.57	7170
B&B 2000	0.549	0.829	0.929	0.974	4.64		6670
B&B 2008	0.582	0.837	0.928	0.975	4.66	5.54	8880
P-Value					0.000		
Full Sample T-tests					***P*-value**		
1993=2000					0.000		
1993=2008					0.000		
2000=2008					0.419		
Public Not Top 50							
B&B 1993	0.310	0.687	0.875	0.952	5.16	9.50	3270
B&B 2000	0.389	0.745	0.895	0.963	4.93		2980
B&B 2008	0.425	0.758	0.896	0.962	4.94	5.84	3700
P-Value					0.000		
Public Top 50							
B&B 1993	0.440	0.823	0.946	0.982	4.79	4.91	1400
B&B 2000	0.571	0.886	0.964	0.983	4.52		1080
B&B 2008	0.646	0.891	0.956	0.987	4.49	3.63	1370
P-Value					0.000		
Private Less Selective							
B&B 1993	0.579	0.828	0.912	0.957	4.71	12.58	1580
B&B 2000	0.676	0.887	0.944	0.980	4.44		1750
B&B 2008	0.715	0.897	0.953	0.982	4.43	5.67	2690
P-Value					0.000		
Private Highly Selective							
B&B 1993	0.741	0.901	0.957	0.978	4.41	4.79	890
B&B 2000	0.779	0.904	0.953	0.984	4.32		830
B&B 2008	0.788	0.934	0.960	0.989	4.31	3.52	1020
P-Value					0.039		

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. Sample consists of students that go to college and receive a bachelor's degree within eight years of graduating high school. The four TTD Distribution columns show the proportion of graduates who earn their degree within 4, 5, 6, and 7 years. The Mean TTD is the average time to degree in years. The HS Lag column reports the average number of months between high school graduation and cohort high school graduation. Sample sizes are rounded to the nearest 10 per the data use agreement.

Table A3
Time to degree distributions for the B&B sample with varying restrictions on TTD timeframe.

	TTD Distribution											Mean	
	4	5	6	7	8	8	10	11	12	13	14	TTD	N
8 years													
B&B 1993	0.441	0.774	0.909	0.964								4.90	6790
B&B 2000	0.523	0.826	0.926	0.973								4.73	6130
B&B 2008	0.580	0.838	0.932	0.975								4.66	8610
P-Value												0.000	
10 years													
B&B 1993	0.422	0.741	0.870	0.923	0.958	0.982						5.10	7070
B&B 2000	0.508	0.801	0.898	0.944	0.970	0.989						4.87	6280
B&B 2008	0.565	0.817	0.908	0.950	0.975	0.991						4.77	8840
P-Value												0.000	
12 years													
B&B 1993	0.412	0.723	0.848	0.900	0.934	0.957	0.975	0.991				5.25	7230
B&B 2000	0.500	0.788	0.884	0.929	0.955	0.973	0.984	0.993				4.98	6370
B&B 2008	0.558	0.806	0.896	0.937	0.961	0.978	0.986	0.993				4.87	8970
P-Value												0.000	
15 years													
B&B 1993	0.400	0.702	0.824	0.875	0.907	0.930	0.948	0.963	0.972	0.981	0.992	5.50	7420
B&B 2000	0.492	0.775	0.869	0.914	0.939	0.957	0.968	0.977	0.984	0.991	0.997	5.12	6470
B&B 2008	0.548	0.791	0.880	0.920	0.944	0.960	0.969	0.975	0.982	0.989	0.997	5.03	9110
P-Value												0.000	
No restriction													
B&B 1993	0.368	0.645	0.758	0.804	0.834	0.855	0.871	0.885	0.893	0.901	0.911	6.92	8000
B&B 2000	0.472	0.744	0.834	0.877	0.901	0.918	0.929	0.938	0.944	0.951	0.956	5.89	6730
B&B 2008	0.523	0.756	0.840	0.879	0.902	0.917	0.925	0.931	0.938	0.944	0.952	5.91	9480
P-Value												0.000	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Baccalaureate and Beyond 1993, 2000, 2008. Uses the same sample and definitions as Table 1, with 2 differences. (1) The requirement that students begin college within 2 years of finishing high school is dropped. (2) The sample is put through 5 different restrictions on TTD, shown in bold. Sample sizes are rounded to the nearest 10 per the data use agreement.

Table A4
Eight year time to degree distributions for the State School Sample of College Graduates by year, excluding transfer students.

	TTD Distribution				Mean	Credits	
	4	5	6	7	TTD	Earned	N
Graduation Year							
1996	0.490	0.883	0.971	0.993	4.50	122.7	18,497
1997	0.487	0.884	0.972	0.992	4.51	122.6	18,961
1998	0.504	0.877	0.972	0.993	4.50	121.9	20,487
1999	0.521	0.897	0.974	0.993	4.46	121.0	20,725
2000	0.528	0.895	0.973	0.992	4.46	120.4	21,634
2001	0.530	0.899	0.973	0.992	4.45	120.5	23,253
2002	0.535	0.900	0.974	0.993	4.44	121.0	24,971
2003	0.553	0.903	0.972	0.992	4.43	121.2	26,802
College Entrance Year							
1990	0.465	0.873	0.966	0.990	4.54	122.5	17,428
1991	0.469	0.883	0.969	0.992	4.53	122.5	17,680
1992	0.480	0.876	0.967	0.990	4.53	123.3	17,715
1993	0.472	0.872	0.970	0.991	4.54	122.4	18,317
1994	0.497	0.883	0.970	0.991	4.50	122.1	18,960
1995	0.493	0.887	0.969	0.991	4.51	121.4	20,196
1996	0.526	0.888	0.970	0.992	4.47	121.0	20,872
1997	0.505	0.891	0.972	0.993	4.48	120.7	22,228
1998	0.522	0.904	0.981	0.996	4.44	120.9	23,435
1999	0.551	0.935	0.988	0.996	4.38	121.0	23,918
Top Quartile SAT Math by College Entrance Year							
1990	0.474	0.874	0.970	0.989	4.54	122.2	4309
1991	0.463	0.883	0.971	0.992	4.54	122.5	4525
1992	0.451	0.864	0.965	0.988	4.58	124.3	4827
1993	0.458	0.863	0.973	0.992	4.57	123.3	5043
1994	0.468	0.874	0.969	0.991	4.55	123.1	5165
1995	0.473	0.868	0.967	0.991	4.55	122.3	5657
1996	0.493	0.878	0.968	0.991	4.53	122.4	5730
1997	0.484	0.871	0.970	0.993	4.54	122.3	6071
1998	0.495	0.891	0.980	0.997	4.49	122.2	6616
1999	0.534	0.932	0.991	0.998	4.40	122.1	6910
Bottom Half SAT Math by College Entrance Year							
1990	0.458	0.873	0.965	0.990	4.55	123.1	8639
1991	0.470	0.877	0.967	0.993	4.53	122.8	8828
1992	0.495	0.879	0.966	0.991	4.51	123.3	8271
1993	0.476	0.877	0.968	0.991	4.53	121.9	8750

(*continued on next page*)

Table A4 (*continued*)

	TTD Distribution				Mean	Credits	
	4	5	6	7	TTD	Earned	N
1994	0.519	0.889	0.970	0.989	4.47	121.7	9069
1995	0.500	0.893	0.967	0.990	4.49	121.1	9499
1996	0.542	0.893	0.968	0.991	4.45	120.6	9868
1997	0.512	0.900	0.973	0.993	4.46	120.4	10,244
1998	0.528	0.905	0.980	0.995	4.43	120.4	10,618
1999	0.555	0.932	0.985	0.994	4.38	121.0	11,289
Under Age 20 at College Entrance Year							
1990	0.467	0.873	0.967	0.990	4.54	122.5	14,637
1991	0.468	0.885	0.970	0.992	4.53	122.4	14,995
1992	0.475	0.875	0.968	0.991	4.54	123.4	14,951
1993	0.469	0.874	0.971	0.992	4.54	122.8	15,370
1994	0.488	0.880	0.970	0.991	4.52	122.7	16,119
1995	0.485	0.884	0.970	0.991	4.52	121.8	17,178
1996	0.514	0.889	0.969	0.992	4.49	121.6	17,883
1997	0.497	0.889	0.972	0.993	4.50	121.7	18,738
1998	0.511	0.901	0.980	0.996	4.46	122.0	19,894
1999	0.542	0.930	0.987	0.995	4.40	122.0	20,484
Age 20 or older at College Entrance Year							
1990	0.454	0.872	0.963	0.990	4.53	122.5	2791
1991	0.474	0.873	0.966	0.991	4.50	123.1	2685
1992	0.506	0.879	0.965	0.989	4.48	122.4	2764
1993	0.485	0.867	0.965	0.990	4.52	120.3	2947
1994	0.552	0.900	0.972	0.987	4.40	119.1	2841
1995	0.540	0.901	0.963	0.994	4.45	118.7	3018
1996	0.598	0.885	0.972	0.991	4.39	117.1	2989
1997	0.550	0.897	0.973	0.995	4.41	115.6	3490
1998	0.583	0.922	0.991	0.999	4.34	114.7	3541
1999	0.602	0.967	0.998	0.999	4.27	114.6	3434

SOURCE: Sample consists of students who receive a bachelor's degree within eight years of starting college with transfer students excluded at Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, Georgia Tech, North Carolina A&T, North Carolina State, Purdue, and Virginia Tech. The four TTD Distribution columns show the proportion of graduates who earn their degree within 4, 5, 6, and 7 years. The Mean TTD is the average time to degree in years for this sample. Top Quartile is defined as students with an SAT math score of 640 or above while Bottom Half is defined as an SAT math score of 580 or below.

Table A5
Transfer credits, credits earned, and time to degree for State School sample by College Entrance Year.

	Entering Credits	Credits Earned	Fraction Graduated	Time to Degree	N
			All Students		
Entrance Year					
1991	39.3	97.1	0.614	4.17	44,990
1992	40.9	97.1	0.622	4.15	46,013
1993	41.9	97.6	0.626	4.17	50,021
1994	41.8	96.2	0.612	4.11	47,436
1995	39.8	96.0	0.610	4.15	51,536
1996	39.0	96.5	0.619	4.11	51,054
1997	38.7	96.1	0.620	4.12	53,316
1998	36.4	96.0	0.617	4.13	53,784
1999	36.4	97.2	0.632	4.08	54,887
			Transfer Students Only		
Entrance Year					
1991	45.3	94.4	0.633	3.37	16,257
1992	47.7	93.3	0.636	3.30	15,477
1993	47.6	93.3	0.638	3.29	15,846
1994	48.1	91.7	0.623	3.22	16,533
1995	46.6	92.6	0.628	3.27	16,208
1996	45.0	92.3	0.636	3.24	16,132
1997	45.3	92.3	0.629	3.25	16,630
1998	43.7	91.2	0.611	3.26	15,819
1999	45.7	92.6	0.648	3.28	16,051
			Transfer Students Excluded		
Entrance Year					
1991	11.2	98.6	0.604	4.64	28,718
1992	11.7	99.1	0.615	4.60	30,529
1993	11.6	99.5	0.621	4.58	34,166
1994	13.0	98.6	0.606	4.59	30,893
1995	12.4	97.6	0.602	4.57	35,322
1996	18.2	98.4	0.612	4.53	34,918
1997	13.6	97.8	0.616	4.53	36,686
1998	12.7	98.0	0.620	4.49	37,964
1999	11.8	99.2	0.626	4.42	38,835

SOURCE: Sample consists of students entering Clemson, Colorado, Colorado State, Florida, Florida A&M, Florida State, Georgia Tech, North Carolina A&T, North Carolina State, Purdue, and Virginia Tech by year. Entering credits includes AP credit, transfer credits, and other college credit accepted by the institution at entrance. The time to degree is reported only for graduates.

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Daniel Sabey has no interests to disclose. The Institution of Education Sciences reviewed the results to assure that individual students cannot be identified.