An Investigation into University Tuition Models Across the United States

David Holman, Samuel Kissinger, Robert Hammer

March 2017

Center for College Affordability and Productivity

An Investigation into University Tuition Models Across the United States

David Holman, Samuel Kissinger, Robert Hammer

A policy paper from the

Center for College Affordability and Productivity

March 2017

About the Authors

David Holman is a 2016 graduate of Ohio University with a B.S. in Communication and minors in Economics and History. During his undergraduate time, he worked as a research assistant for economist Richard Vedder at the Center for College Affordability and Productivity. He currently resides in Columbus, Ohio, working as a general manager for Waffle House.

Samuel Kissinger is a 2016 graduate of Ohio University with a B.S. in Economics and a minors in Mathematics and Finance. During his undergraduate time, he worked as a research assistant for economist Richard Vedder at the Center for College Affordability and Productivity. He currently resides in Washington, DC, working as an economist at the Bureau of Labor Statistics.

Robert Hammer is a 2016 graduate of Ohio University with a B.S. in Economics and minors in Anthropology and Spanish. During his undergraduate time, he worked as a research assistant for economist Richard Vedder at the Center for College Affordability and Productivity. He currently resides in Lebanon, New Hampshire, working as a program associate at the Calvin Coolidge Presidential Foundation.

Acknowledgments

This study would not have been possible without the leadership and mentorship displayed by Dr. Richard Vedder, an economist that has been teaching at Ohio University continuously since 1965. Thanks is due to Joshua Distel, administrative director of the Center for College Affordability and Productivity, as well as Timothy McKenna for their help in the editing process.

Gratitude is also given to the public universities' office of institutional research teams that were willing to supply data. It should be noted that many universities failed at responding or refused to comply with the authors' data requests.

The Center for College Affordability and Productivity would also like to thank the Searle Freedom Trust and Charles Koch Foundations for support of CCAP efforts. Kim Dennis and her associates at Searle have given us not only resources but good advice over the years. We also appreciate the administrative support we have received from Donors Trust and Project Liberty.

Center for College Affordability and Productivity

The Center for College Affordability and Productivity (CCAP) is a non-partisan, nonprofit research center based in Washington, DC, dedicated to research public policy and economic issues relating to postsecondary education. CCAP aims to facilitate a broader dialogue that challenges conventional think about costs, efficiency, learning outcomes and innovation in postsecondary education in the United States.

1055 Thomas Jefferson Street #L26
Washington, DC 20007
Telephone: (202) 621-0536

Website: www.centerforcollegeaffordability.org
Email: theccap@centerforcollegeaffordability.org

Contents

Section I:

Introduction

Tuition fees at colleges and universities are difficult to interpret because the sticker price often does not reflect the total dollar amount a student will pay. Scholarships and financial aid lower the student's tuition cost along with such factors as the student's major, level of class instruction, and technology fees. However, the number of credit hours of instruction the student receives usually determines the bulk of a student's tuition bill.

Most public four-year colleges in the United States charge tuition for credit hour instruction in one of three ways. We call the three tuition models we present in this study the **Credit Hour**, **Unlimited**, and **Tuition Band** models. Each model offers different benefits and costs. The type of model used impacts student behavior, and one can argue that the goal should be to implement the tuition model that provides optimal graduation rates. At the same time, however, a school must have a tuition model in place that allows it to cover the costs of educating its students.

Section II:

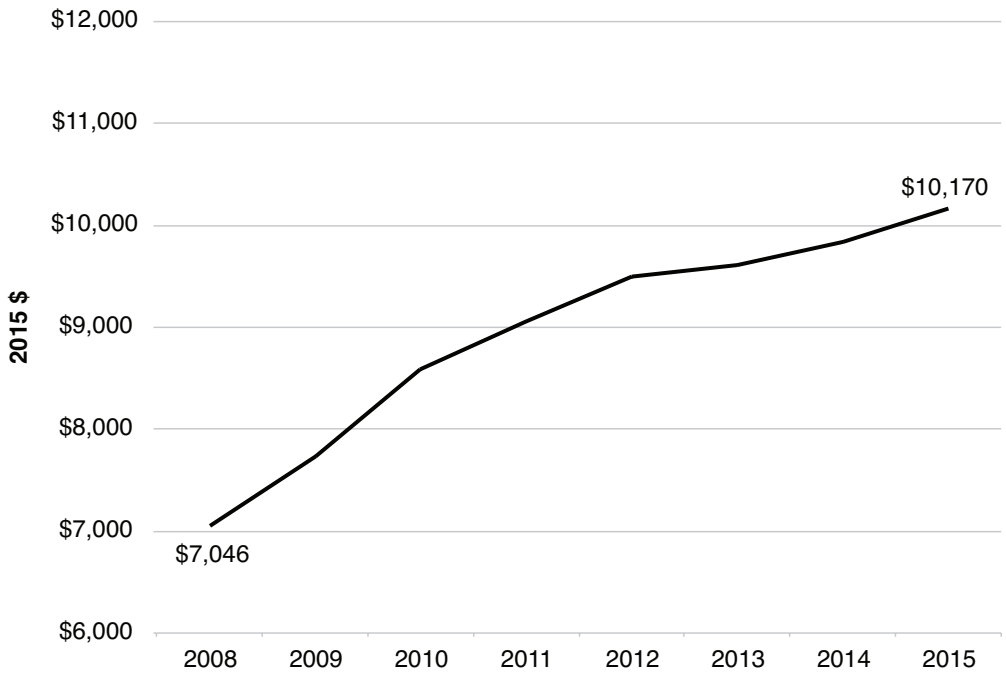
Current Status of Higher Education

As of 2014, only 50 of the more than 580 four-year public universities in the United States graduated a majority of full-time students on time.[1] Nationally, public four-year colleges fail to graduate 42 percent of first-year full-time students within six years.[2] Of those that do graduate, 69 percent are burdened with student debt averaging nearly $29,000.[3] While students tend to struggle to make payments on their loans, universities have encountered a financial battle of their own.

Since the Great Recession, states have made severe cuts to funding for public universities. In the 2014-15 academic year, 47 states provided less funding per student than they did at the start of the Great Recession.[4] In turn, public universities have aggressively increased tuition, and looked to out-of-state students to close the funding gap. For example, Alabama as a state now supplies 37 percent less appropriations for higher education per student than it did in 2008. In the same period, the University of Alabama, Tuscaloosa has raised tuition by 44 percent when adjusting for inflation (Figure 1).[5]

To help combat decreases in state funding, the University of Alabama has increased its percentage of out-of-state undergraduates from 28 to 54 percent since the start of the recession. By no means is the University

Figure 1: University of Alabama Annual In-State Tuition, 2008–2015



Note: Tuition values supplied by University of Alabama Office of Institutional Research.

of Alabama an outlier. In October of 2015, five months after Wisconsin state legislators proposed a $59.8 million state funding cut for the 2015-16 academic year, the University of Wisconsin, Madison lifted its 27.5 percent cap on out-of-state undergraduates.[6] At the University of South Carolina, the portion of out-of-state freshmen has nearly doubled since 2000, increasing from 23 to 45 percent.[7]

As the post-recession era continues, public universities have challenges when it comes to generating funds. At the same time, aggregate student loan debt in the United States now sits at $1.2 trillion.[8] The motivation of the school and student can contradict each other. Financially, a university has an incentive in the short-run to encourage students to finish their degrees late. In the long-run, though, better four-year graduation rates may lead to higher prestige, better quality of incoming students, and more alumni donations as less graduates are financially strained by loans brought about from additional years of study. Examining the effects associated with tuition models, in this study we argue that four-year universities should structure tuition models to incentivize students to enroll in more credit hours than they currently do, thus leading to improved four-year graduation rates.

Section III:

Explanation of Tuition Models

As indicated, the three tuition models this study examines are Credit Hour, Unlimited, and Tuition Band. It is important to note that 120 credit hours is the minimum total needed for a bachelor's degree at the majority of colleges and universities in the United States. Therefore, a student must enroll in 15 credit hours per semester over four years to graduate in the four years customary for the bachelor's degree.

Credit Hour

The Credit Hour model is simple; a student pays a standard credit hour rate for each additional hour enrolled. For example, an in-state student enrolled in 12 credit hours at Michigan State University pays $478 less than an in-state student enrolled in 13 credit hours.[9] Refer to Table 1 for a full breakdown of Michigan State tuition by credit hour.

The standard weight for a college course is three credit hours, meaning a typical class at Michigan State comes with a marginal financial cost of over $1,400 for an in-state student. Charging part-time students by the credit hour is uniform for nearly all colleges, but most do not continue the method with full-time students. At the majority of U.S. colleges, students must take 12 credit hours for the college to consider them full-time.

One might argue that the Credit Hour model makes reasonable sense as the student pays proportionally for the amount of instruction received. However, under the Credit Hour model, students experience financial strain with each credit hour consumed. The Credit Hour model weights all credit hours equally, but in reality, the law of diminishing marginal returns is at play along with other factors.

Table 1: 2015 Fall Semester Tuition at Michigan State University

Credit Hours	In-State	Out-of-State
12	$5,730	$14,774
13	$6,208	$16,005
14	$6,685	$17,236
15	$7,163	$18,467
16	$7,640	$19,698
17	$8,118	$20,929
18	$8,595	$22,160
19	$9,073	$23,391
20	$9,550	$24,623

Note: Tuition values calculated from values listed on Michigan State's website.

In some situations, say large lecture courses, the marginal cost to the school of educating one more student is often very low. The instructor is paid the same if 215 are in the class instead of 214. In situations like these, one could argue that the Unlimited or Tuition Band models discussed below are appropriate if the goal is to align charges to costs. In other situations, the addition of another student forces the university to add more sections of the course, imposing a high cost. The Credit Hour model makes some sense in this situation.

The 18th credit hour for a student is not the same as the 12th credit hour. Under any tuition model, additional credit hours come with an opportunity cost, one that consumes time that students may otherwise utilize for more hours of work at a job to help cover their education cost. Under the Credit Hour model, the opportunity cost encompasses lost wages and the fees associated with additional credit hours of study.

Likewise, a school with the entirety of its student body enrolled in 18 credit hours must employ more resources than a school with every one of its students taking 12 credit hours. The cost of having students take more credit hours is more classrooms, professors, and less individualized instruction, among other costs. In this sense, universities must carefully monitor tuition prices to ensure proper funding for resources.

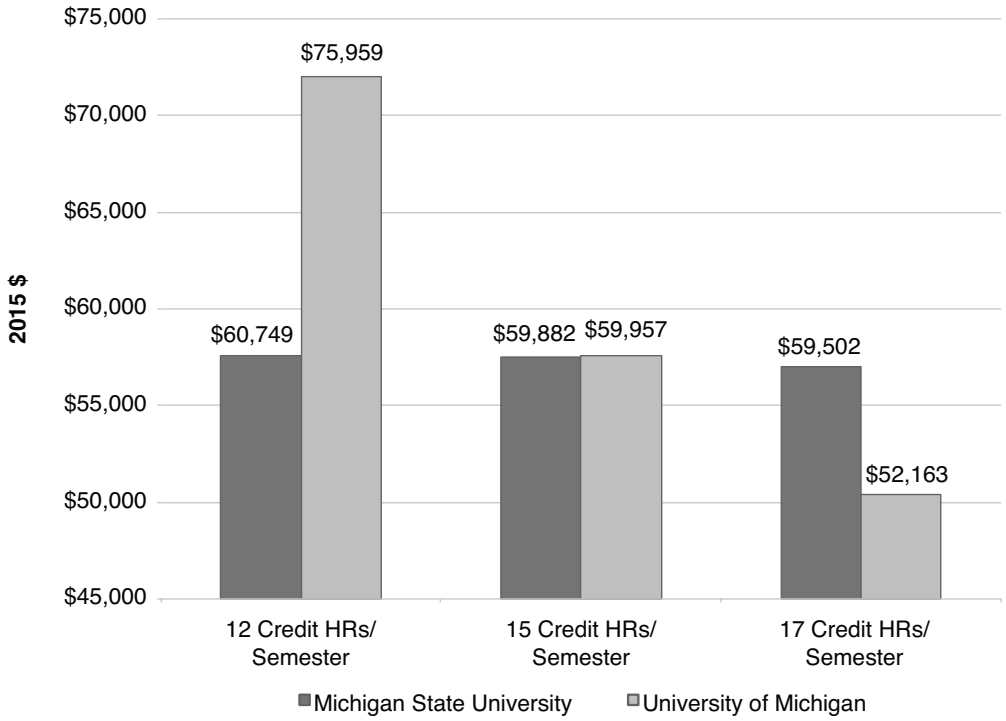
A criticism of the Credit Hour model is that it does not incentivize students to enroll in 15 credit hour course loads and thus discourages them from graduating in four years. For a student that falls behind in her studies due to a change in major, this can be detrimental. At many Credit Hour universities, students not only have to factor in the financial cost of more credit hours, but they must consider the probability that they will drop the class in the middle of the semester. For example, a student attending the University of Houston — a Credit Hour school — does not receive any money back after withdrawing from a class unless they decide to do so prior to the end of the third week of the semester.[10]

There is potential for a student to benefit from the Credit Hour model. If a student anticipates taking longer than four-years to finish his degree, the Credit Hour model, as opposed to other tuition models, may save them money in the short-run. For example, Figure 2 shows the cost of a bachelor's degree by calculating the financial cost of 120 credit hours at Michigan State University and the University of Michigan, Ann Arbor based on how many credit hours an in-state student enrolls in per semester.

While an in-state student enrolled in 15 credit hours at the University of Michigan pays about the same price he would at Michigan State, averaging a lighter or heavier course load changes the financial cost of a four-year degree. This difference is because the University of Michigan charges a one-time flat-rate for 12 to 18 credit hours. Effectively, students who enroll in 12 credit hours each semester—a rate that projects them for at minimum a five-year graduation—save more than $15,000 in tuition by attending Michigan State over the University of Michigan. However, it we should note that studies suggest a fifth year of undergraduate study costs the average college student over $68,000 when factoring cost of attendance with lost wages.[11] Contrarily, a student averaging 17 credit hours over seven semesters will save $7,000 by attending the University of Michigan over Michigan State. At both schools, enrolling in 17 credit hours each semester—an amount pacing the student for graduation in 3.5 years—can save the student $26,000 in cost of attendance and lost wages.[12]

Commuter students arguably have the most to gain from the Credit Hour model. Enrolling in larger course loads can be hard to manage for commuters. Unlike a student living on-campus, a typical commuter is only on campus for class purposes. Commuters cannot afford to schedule more classes if they come with long breaks that will keep them stranded on campus. This is especially the case for students who have to work while in school. However, student-workers can save in the end by graduating in four years as opposed to five or six.

Figure 2: In-State Tuition Cost of a Bachelor's Degree



Note: Tuition values calculated from values listed in Michigan Association of State Universities 2015-16 Tuition and Fees Report.[13]

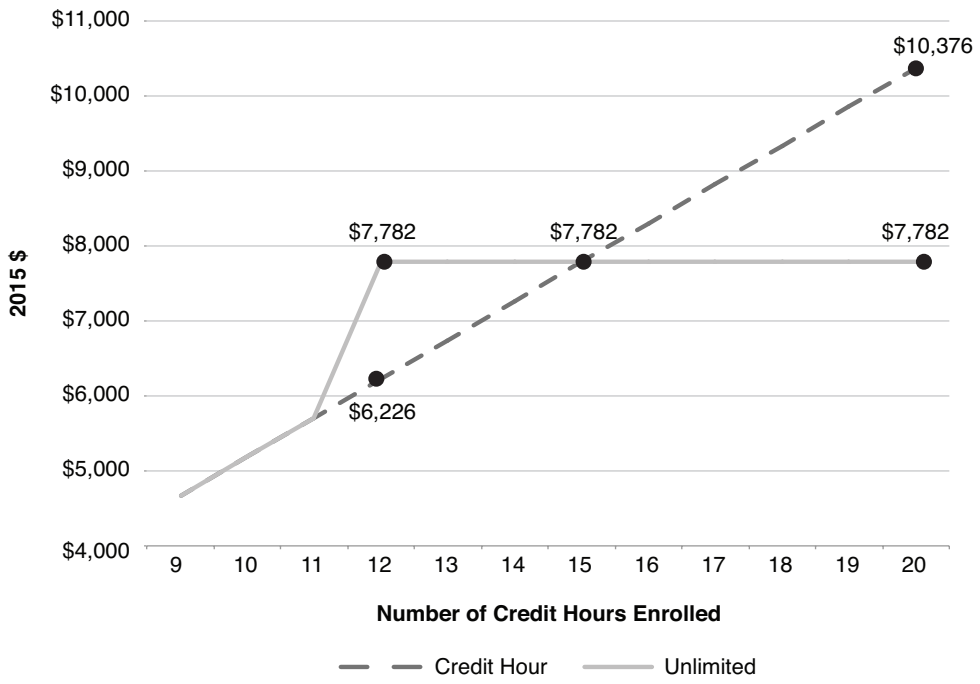
There are short-run cost-saving strategies students can utilize under the Credit Hour model that students under other tuition models cannot. For example, the University of Colorado, Denver is a Credit Hour school located in a large city. Over one-fourth of the school's students are part-time and there is only dorm capacity for 9% of its full-time students.[14] Less than two-thirds of UC-Denver's full-time students enroll in more than 12 credit hours resulting in an abysmal 15% four-year graduation rate. From this, it seems apparent that many of the students are commuters and the Credit Hour model works somewhat in their favor, although, lost wages and added years of living expenses while in school must be considered.

While it is desirable for schools to encourage their students to graduate in four years, it may not be feasible given some students' time and financial resources. For these students, the Credit Hour model may be beneficial.

Unlimited

In contrast to the Credit Hour model, the Unlimited tuition model charges a one-time fixed rate for full-time students, regardless of how many credit hours they enroll in. The flat rate usually kicks in after 12 credit hours—the standard amount needed for full-time consideration. The foremost benefit is a marginal financial cost of zero for a student that undertakes a larger course load. Unlike the Credit Hour model,

Figure 3: University of Oklahoma Annual In-State Tuition by Tuition Model



Note: Tuition values calculated from values listed on University of Oklahoma's website.

under the Unlimited model, a student enrolled in 12 credit hours theoretically pays the same price for instruction as a student studying 18 credit hours.

A drawback of the Unlimited model is that it may induce students to enroll in a course load larger than they are capable of handling, which can result in poorer performance. To deter this, schools operating under the Unlimited model often require permission and GPA minimums for students to enroll in course loads that approach 18 or 20 credit hours. Another potential negative with the Unlimited model is that it may not explicitly communicate to the student that they should be enrolled in at least 15 credit hours. The Unlimited model indicates that a student can take more than twelve credit hours, but not necessarily that the student *should* take 15 or more credit hours to ensure on-time graduation.

As the University of Oklahoma did in 2013, when a school changes from a Credit Hour model to an Unlimited model, the flat tuition rate often resembles the school's 15 credit hour price under the Credit Hour model.[15] Figure 3 shows the disparity in tuition prices at Oklahoma under the two different tuition models.

A number of graduating seniors were displeased with Oklahoma because they only needed 12 more credit hours to graduate. To cater to students negatively affected by the tuition model change, the University offered an appeals process for students who did not need 15 credit hours to graduate, or did not have enough time to enroll in 15 credit hours because of job duties.[16]

Additionally, the University mandated that if students did not attempt at least 30 credit hours over the fall and spring semester, they would be able to apply the loss margin of tuition to summer classes, free of

charge.[17] Oklahoma's unique tuition model incentivizes optimal use of resources as it clarifies to the student that they are losing value if they do not enroll in at least 15 credit hours per semester, and do not apply the lost margin tuition credit to a summer session. It should be noted that no other universities operating under the Unlimited tuition model are known by the authors to practice this type of tuition rebate.

A risk that a college runs under the Unlimited model concerns capacity. If every single student takes, say, 18 or more credit hours, the school may not have the resources to provide every student with what they need. However, if the school has the resources, the Unlimited model incentivizes students to enroll in as many credit hours they feel they can handle, because doing so gives the student the most cost-efficient deal. If classroom seats go otherwise unfilled, and the professor has the ability to take on another student—an extremely low marginal cost—a university appears most efficient under the Unlimited model.

When a student falls behind in his or her studies, the Unlimited model encourages them to catch up. Also, the student does not have to worry about financial losses from a dropped class. Students under the Unlimited model have greater opportunities for electives, minors, and even double-majoring. More importantly, in situations when classes are offered only once a year, or when the student needs more classes to fill prerequisites, the Unlimited model gives students an opportunity to stay on a four-year graduation track. For the university, an Unlimited model can raise school prestige by leading to better four-year graduation rates.

Tuition Band

The Tuition Band model charges students a fixed tuition price for a certain range of credit hours. Similar to Unlimited, students do not pay additionally per credit hour after the minimum amount of credit hours needed for full-time status. However, under the Tuition Band model students are subject to pay the credit hour rate for classes that exceed the maximum number of credit hours in the range. For example, Ohio State University operates a Tuition Band schedule of 12 to 18 credit hours. For each credit hour over 18, an in-state student pays roughly $400 in addition to the fixed tuition amount.[18]

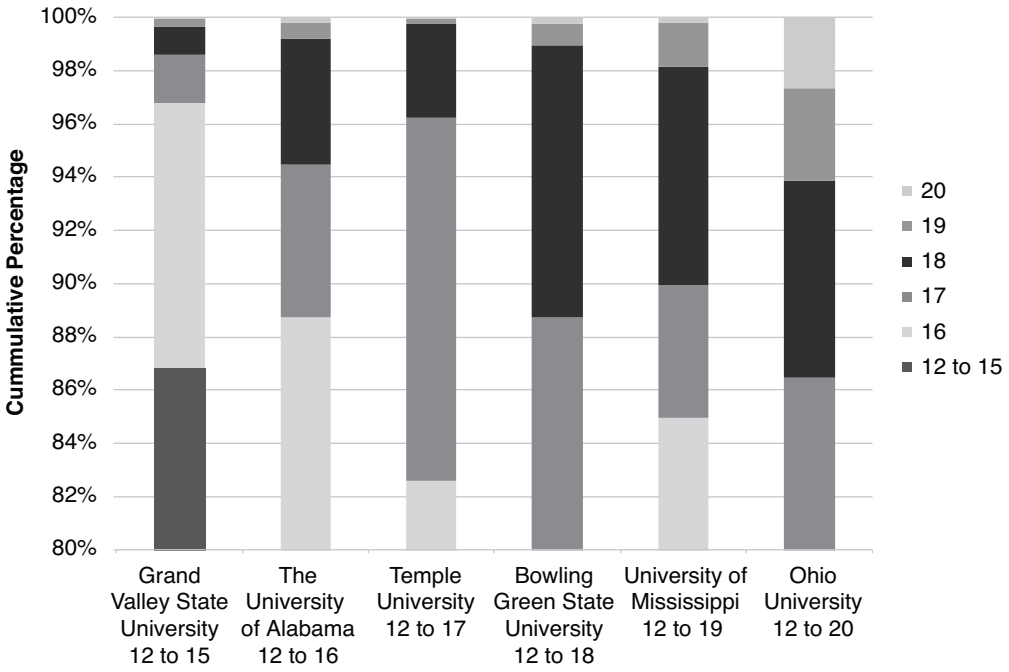
There are many varieties of the Tuition Band model. The most standard version is 12 to 18, but tuition bands at public universities in this study differ from 12 to 15 all the way up to 12 to 21. As Figure 4 details, a school's credit hour cap has a significant impact on how many credit hours the most intensive students tend to study in a semester.

One positive aspect of the Tuition Band model is that students are encouraged to take 15 credit hours because they are not assessed additional fees to do so. However, if the ceiling of the band is too low, say, 16 credit hours, then students are discouraged from enrolling in a course load exceeding the range, even if they are not on track to graduate on time. Like the Credit Hour model, schools do not typically refund students if they exceed the cap and then drop the class near the semester midpoint.

Tuition Band caps of 16 or 17 credit hours are arguably poorly conceived because the majority of college classes are weighed at three credit hours. Thus, there are cases in which students have a higher probability of enrolling in 18 credit hours than 17 credit hours. There is supporting evidence in our research that suggests universities intentionally set a low cap to bring in more tuition dollars.[19] In a way, this method is used to "tax" students for enrolling in more credit hours than the cap allows. While the added funding is beneficial to the university, schools with low caps suppress four-year graduation rates.

Like Unlimited models, students enrolled in the minimum credit hour amount—typically 12 credit hours—are at a loss because they are paying a tuition amount that encompasses more classes than they are

Figure 4: Full-Time Student Enrollment by Credit Hour at Tuition Band Colleges



Note: Enrollments provided by each university's office of institutional research.

enrolled. In contrast to the Credit Hour model, colleges running the Tuition Band model do not leave tuition dollars on the table when a full-time student takes less than 15 credit hours. As we saw in Figure 2, the University of Michigan—12 to 18 Tuition Band—gains revenue in the long-run when students enroll in 12 credit hours each semester because additional semesters or years are needed for these types of students to graduate.

In certain instances, the Tuition Band model generates larger course loads for students than the Unlimited model does. For example, Ohio University exercises a 12 to 20 credit hour Tuition Band. Only one Unlimited school in the sample has a higher percentage of its students enrolled in more than 18 credit hours. A credit hour cap signals to the student that not all additional credit hours are "free". It communicates to the student that he or she should consider taking advantage of the credit hours included in the base tuition. The Tuition Band model is a hybrid of the Credit Hour and Unlimited model, and the higher the cap, the more positive effect Tuition Band has on enrollment trends.

Section IV:

Data Collection

169 public universities were asked to provide data. All universities in the study were public and assumed to be operating on a semester calendar.

Data Requested

- Undergraduate enrollment by credit hour—0 to 25 credit hours—for the 2015 fall semester
- Undergraduate enrollment by class standing—FR, SO, JR, SR
- Number of degrees awarded each year, 2008-15
- Number of graduates completing two or more majors each year, 2008-15
- Average credits at graduation for each year, 2008-15
- Tuition model operated each year, 2003-16

We received complete responses from 70 public institutions consisting of 1.1 million full-time students across 30 different states. Aside from data supplied by each school, statistics from the Integrated Postsecondary Education Data System (IPEDS) were also used. The IPEDS data was most recently updated in 2014. We acknowledge that this presents a compatibility issue because the requested "undergraduate enrollment by credit hour" used was from 2015. To account for this, we only used percentage data from IPEDS in our regression models. For this reason, results may have varied had perfect data combinations been utilized.

Section V:

Data Analysis

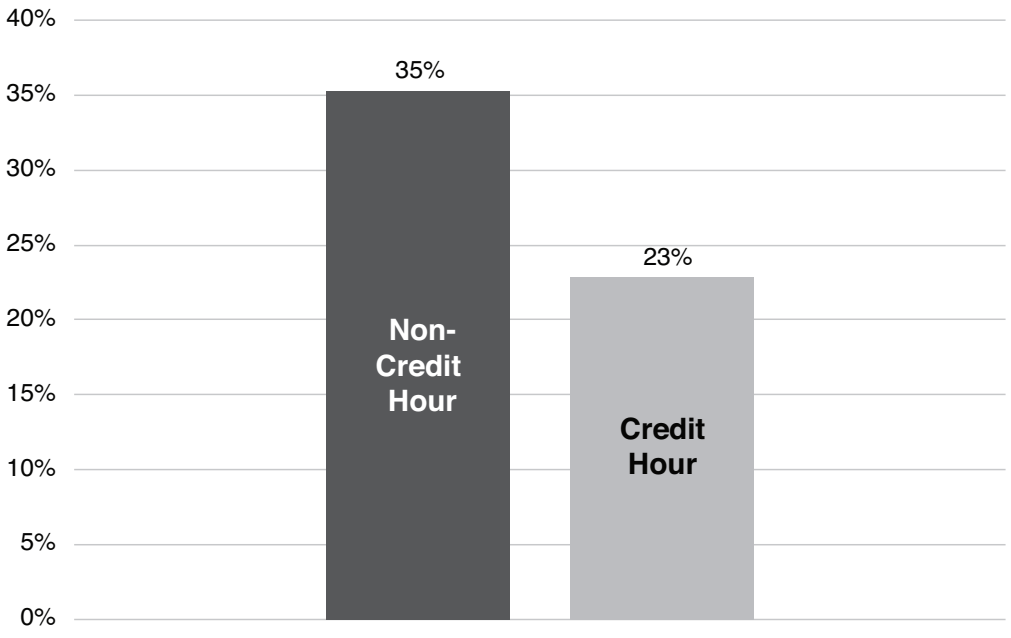
The mean four-year and six-year graduation rates of the schools in the sample were 32 and 57 percent, respectively. These values closely mirror the national averages, making the sample a fair representation of American colleges.[20] Considering these universities are branded as "four-year institutions," we focus primarily on four-year graduation rates over six-year rates.

Separating the universities into two categories—Credit Hour and Non-Credit Hour—a significant difference is evident in four-year graduation rates. We should note that "Non-Credit Hour" refers to schools with a Tuition Band or Unlimited tuition model. In Figure 5, we see that Credit Hour schools graduate students at a four-year rate **12 percent lower than Non-Credit Hour institutions**.

In Table 2, we note that Credit Hour institutions are less prestigious than Non-Credit Hour institutions, receive a lower quality of students, and are less efficient at graduating its students.

While Credit Hour colleges generally matriculate lower quality students, it is difficult to account for ACT score distribution differences in graduation rates. Figure 6 shows the percent of full-time students by tuition model enrolled in less than 15 credit hours for the 2015 fall semester. The percent of graduates who take longer than four years is also given.

Figure 5: 2013 Four-Year Graduation Rates



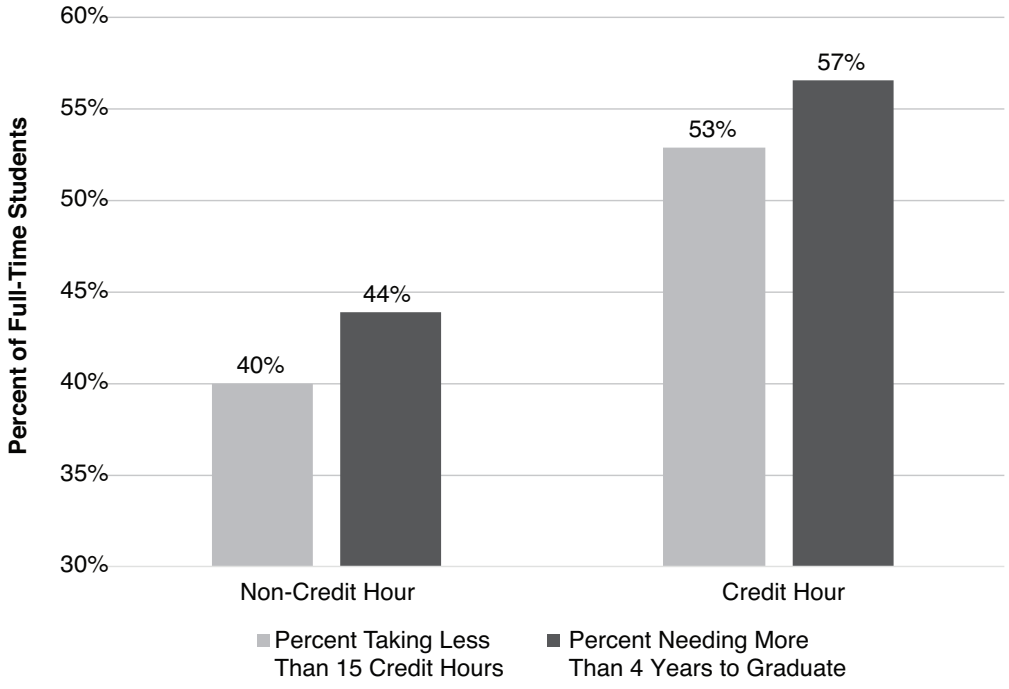
Source: IPEDS[21]

Table 2: Breakdown of Institutions in Data Sample

Tuition Type	ACT 25th Percentile	ACT 75th Percentile	Average Forbes Ranking	Four-Year Graduation Rate	Six-Year Graduation Rate
Credit Hour	21	26	491	23%	51%
Unlimited	23	28	400	39%	64%
Tuition Band	21	27	473	34%	57%
Non-Credit Hour	22	27	441	36%	60%

Source: IPEDS and Forbes.

Figure 6: Enrolled in Less than 15 Credit Hours and Late Graduation

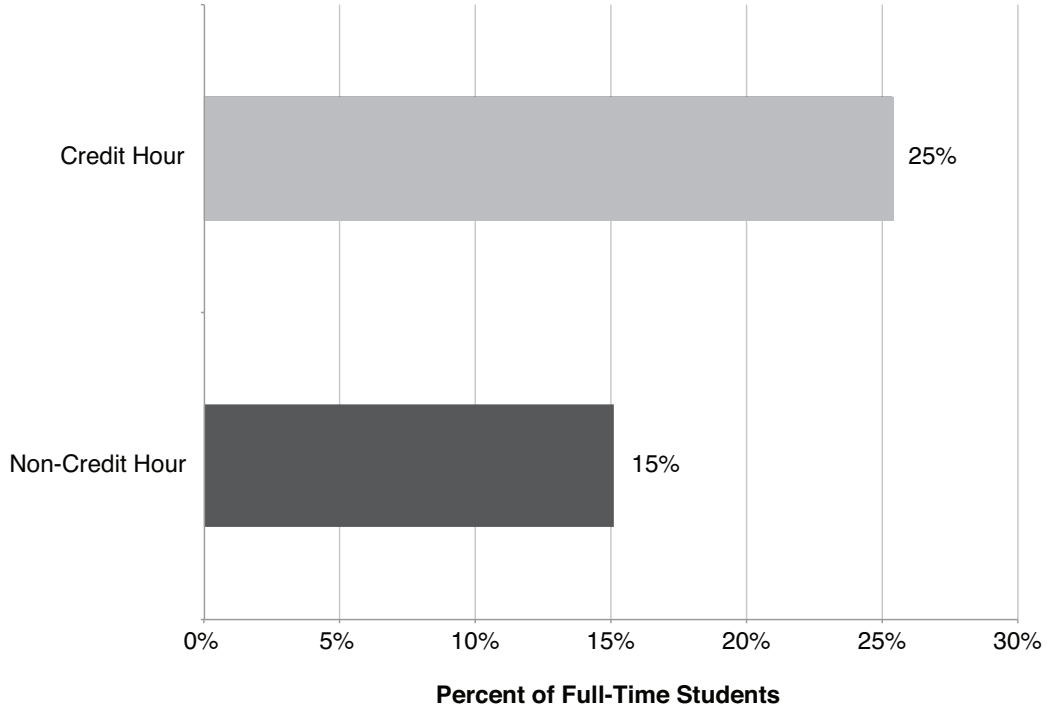


Source: IPEDs and authors' findings.

As mentioned in Section III, students must average 15 credit hours over eight semesters in order to graduate within four years. A positive correlation is observed between the percentage of students enrolled in less than 15 credit hours and the percentage of graduates that take more than four years to complete their degree. Of the 1.1 million full-time students in the complete sample, 440,000 full-time students were not enrolled in 15 credit hours or more.

Half of students enrolled in less than 15 credit hours at Credit Hour schools study only 12 credit hours—the minimum course load to be considered full-time at most colleges in the United States. Figure 7 graphs the percentage of all full-time students enrolled in a minimum course load at both Credit Hour and Non-Credit Hour schools.

Figure 7: Studying Minimum Course Load



Source: Authors' findings.

Econometric Analysis

After adjusting for variables such as school quality, family income[22], and endowment, the analysis shows that **a Credit Hour tuition model lowers a school's four year graduation rate by 6%** (See Table 3).

Table 3: Effect on Four-Year Graduation Rate

Dependent Variable: FourYearGraduation		Number of Observations Used: 71		
Root MSE	8.07789	R-Square		0.7953
Dependent Mean	31.88732	Adj R-Sq		0.7796
Variable	**Parameter Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	45.87112	4.50226	10.19	<.0001
HousingPercent	0.21766	0.07745	2.81	0.0065
CreditHour	-5.65172	2.26454	-2.5	0.0151
ForbesAdjustedRank	-0.34482	0.09096	-3.79	0.0003
EndowmentPerFTE	0.00011654	0.00002951	3.95	0.0002
PercentPellGrant	-0.3062	0.14442	-2.12	0.0378

Source: Authors' findings.

Section VI:

Tuition Revenue

How do universities select their tuition models? One explanation is that certain models generate more university revenue. Without taking scholarships into account, the total amount of annual revenue a school generates from tuition can be calculated using enrollment data. The amounts by institution in our sample vary between $18.2 million at Northwestern State University of Louisiana, all the way up to $766 million at the University of Michigan. Refer to Table 4 for average annual revenue by tuition model.

By dividing the total annual revenue—not including summer enrollment—by the total amount of full-time students, we can observe the average revenue-per-full-time student. The average revenue-per-full-time student is nearly $2000 greater at Non-Credit Hour schools than at Credit Hour schools. Tuition values vary greatly depending on the region's cost of living and school prestige. For example, out of state tuition at the University of Nebraska is roughly $7500, but Big Ten rivals Indiana University and Purdue University charge nonresident students $16,000 and $14,000, respectively.[23]

The difference in revenue-per-full-time student between the tuition models is largely a result of the higher percentage of students at Credit Hour schools enrolled in 12 credit hours. As mentioned in Section III, Non-Credit Hour schools typically charge a fix-rate tuition fee that corresponds to the cost of 15 credit hours under a Credit Hour model. With that being said, the Credit Hour model generates more tuition dollars from students enrolled in more than 15 credit hours. On the flip side, Credit Hour schools lose in the short-run when students study only 12 credit hours, but if a student stays for a fifth year, the margin in tuition revenue between Credit Hour and Non-Credit Hour is neutralized. Figure 8 shows the average in-state tuition cost-per-credit hour for each tuition model.

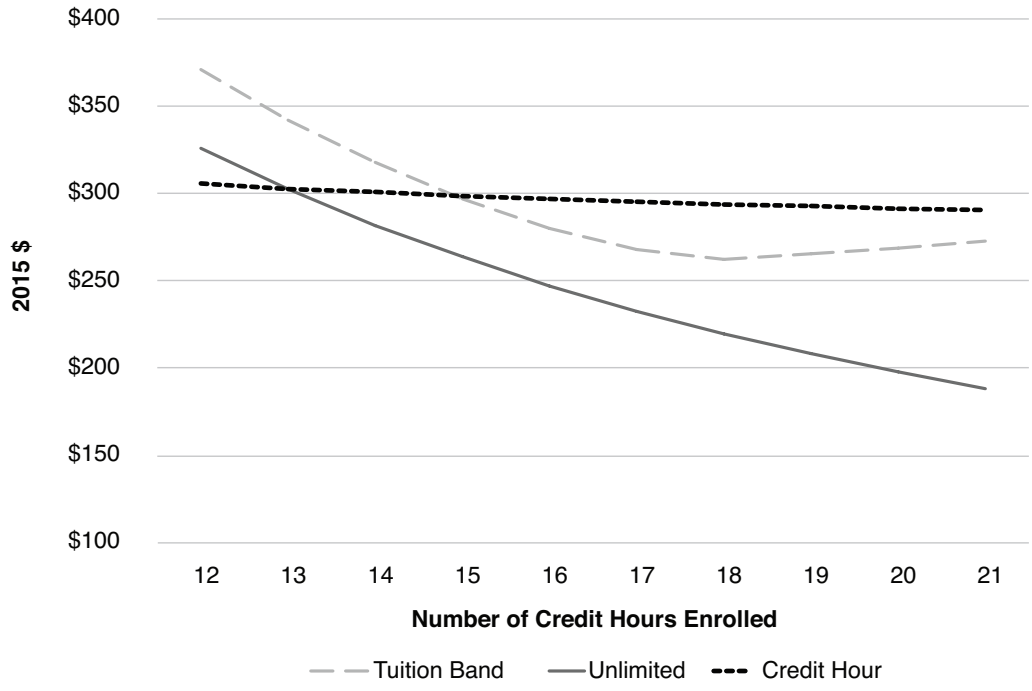
The cost trends are what one expects to see: a horizontal line for Credit Hour, a linear downward trend for Unlimited, and a downward trend that starts to level out at about the 18th credit hour for Tuition Band, which is typically where the range ends. The key observation is that the cost for 12 credit hours is the least expensive at Credit Hour schools, but if students take more than 15 credit hours, Credit Hour schools become the most expensive. Given the fact that students are more likely to take only 12 credit hours at

Table 4: Institution Revenue

Tuition Model	Average Annual Revenue	Average Full-Time Student Body	Revenue-Per-Full-Time Student
Credit Hour	$162.7 Million	15450	$10,315
Unlimited	$225 Million	17900	$12,125
Tuition Band	$229 Million	16450	$12,271
Non-Credit Hour	$227.5 Million	17050	$12,213

Source: Authors' calculations.

Figure 8: Average In-State Tuition Cost Per Credit Hour



Source: Authors' calculations taken from university webpages.[24]

schools that charge by the credit hour, it is not surprising that Credit Hour schools boast the lowest tuition revenue per student out of the three models.

Another observation is that the cost-per-credit hour at Unlimited schools is consistently less than the cost at Tuition Band. The initial hypothesis was that Unlimited schools would charge higher tuition rates because the potential to enroll in more classes at no extra cost is somewhat infinite, whereas the Tuition Band model limits students to a range of credit hours.

Regardless of which one costs more, the Tuition Band and Unlimited models create an incentive for students to take more credit hours per semester because the average cost-per-credit hour under these models decreases as the student enrolls in more credit hours. This holds true for Tuition Band schools until they reach the credit hour cap. At Credit Hour schools, the average cost-per-credit hour remains constant, no matter how many credit hours students enroll in. If the students at Credit Hour schools consistently enrolled in the necessary amount of credit hours for a four-year graduation, Credit Hour models would likely mirror the tuition revenue-per-full-time student that the other models generate. However, students refrain from doing this partially because of the associated cost.

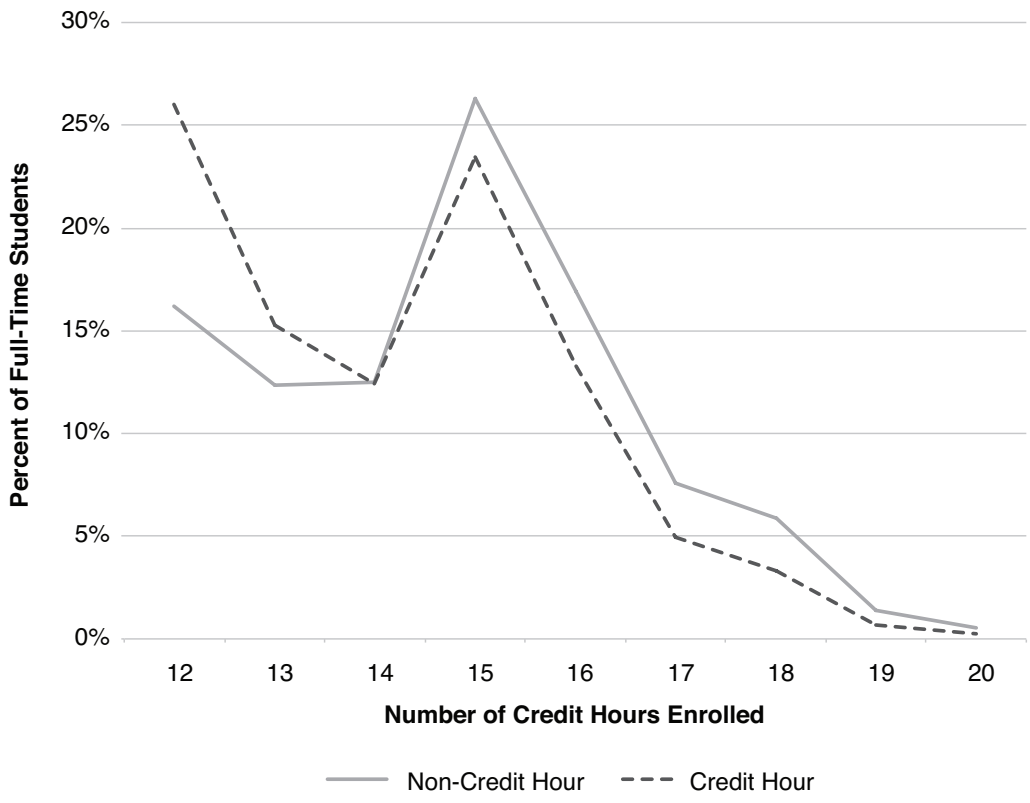
Section VII:

Student Behavior

Student enrollment behavior can be analyzed based on the economic costs of each tuition model. Figure 9 shows student distribution based on credit hours enrolled.

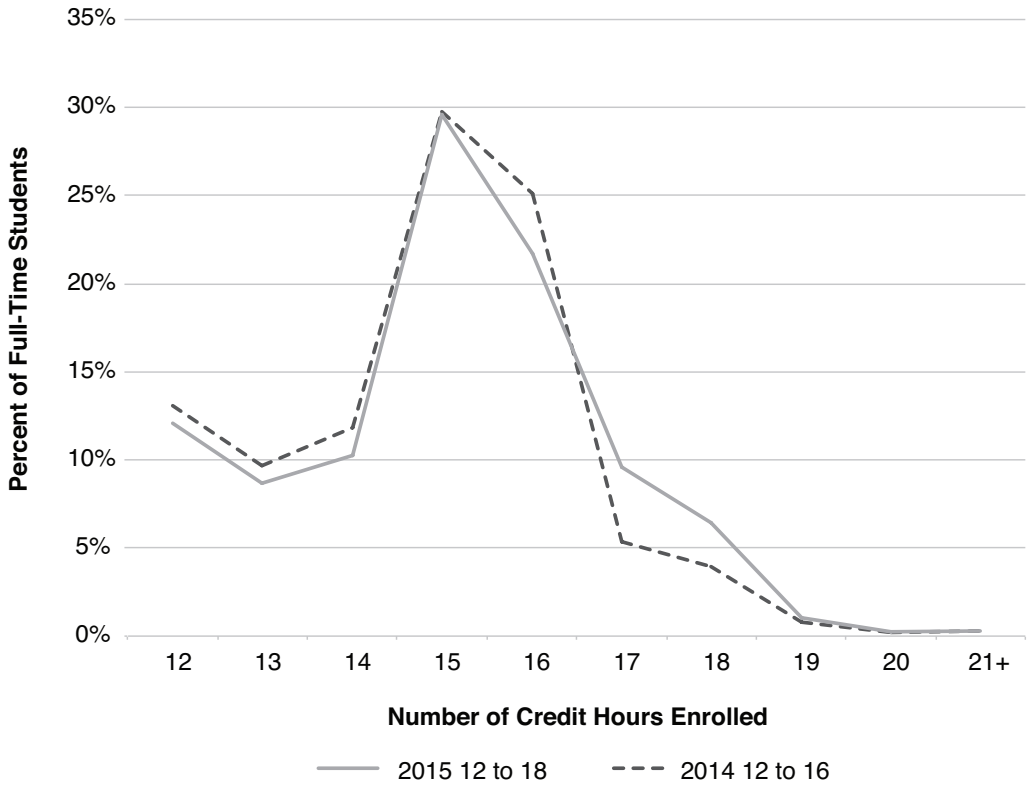
Twenty-six percent of full-time students at Credit Hour schools are enrolled in 12 credit hours—the highest enrollment share for any credit hour total at Credit Hour schools. Non-Credit Hour schools show a higher average percentage of students enrolled in every credit hour past 14.

Figure 9: Distribution of Students by Credit Hour



Source: Authors' findings.

Figure 10: Kent State University Fall enrollment Trends



Source: Kent State University Institution Research Office.

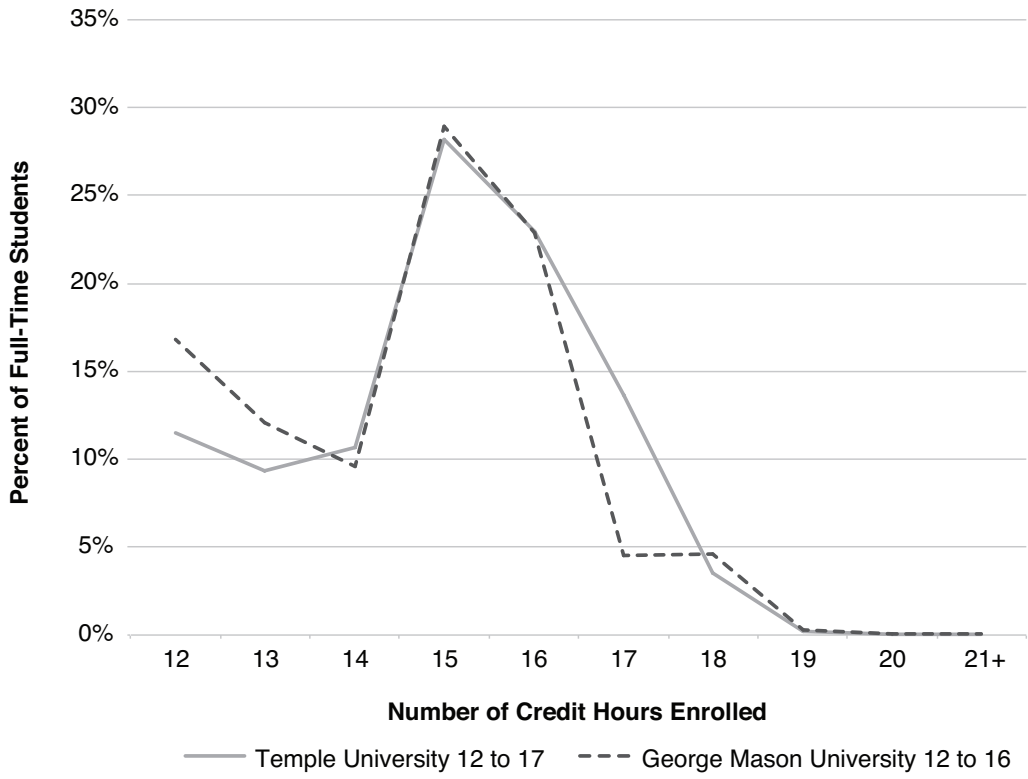
Differences in the Tuition Band Schedule

With respect to Tuition Band schools, the data shows that the demand for credit hours past 15 is rather price elastic. For instance, Kent State operated a 12 to 16 hour tuition model in the 2014-2015 school year. In the 2015-2016 academic year, the school increased its cap to 18 credit hours. Figure 10 examines the change's effect on enrollment.

The increase in the cap hour from 16 to 18 raised enrollment in 17 and 18 credit hours, collectively, by 1,000 students. The effect on credit hour enrollment is evident, despite the tuition model change being announced to Kent State students over the summer, months after returning students would have registered course schedules for the coming fall semester. This means that students responded to the price drop in the cost of the 17th and 18th credit hours and went out of their way to enroll in more classes. In terms of revenue, it appears that Kent State lost approximately $3 million from additional per-credit-hour fees associated with taking 17 or 18 credit hours.[25]

There is a trade-off between graduation rates and revenue for public universities. Kent State's four-year graduation rate increased by a half percent each year from 2003—24.4 percent—to 2013—32.3 percent—only to drop to 31.8 percent in 2014.[26] In 2012, Kent State changed from an unlimited tuition model to a 12 to 17 credit hour Tuition Band, and then slashed it to 12 to 16 credit hours for the 2013-14 academic

Figure 11: Temple University & George Mason University Fall Enrollment Trends



Source: Temple University and George Mason University Offices of Institutional Research.

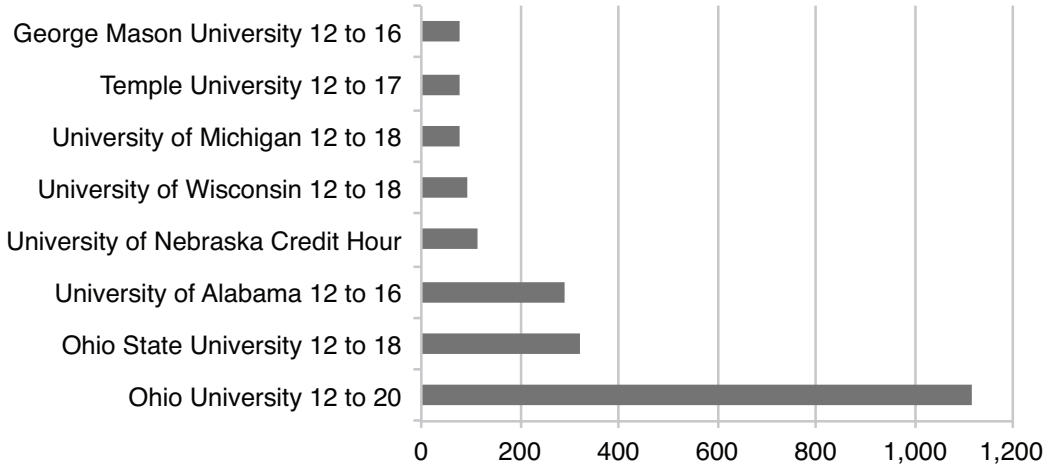
year. It is likely that the tuition model changes were partially responsible for the drop in four-year graduation rate.

The results at Kent State are not unique; students are very sensitive to the Tuition Band margins at seemingly every school in the data set. Figure 11 exemplifies how a difference in the credit hour cap between Temple University and George Mason University affects student enrollment.

Temple University runs under a Tuition Band model that ranges from 12 to 17 credit hours, while George Mason ranges from 12 to 16 credit hours. Notice the margin between the 16th credit hour and the 18th credit hour in Figure 11. The student behavior is nearly identical from the 14th credit hour on, but differs vastly at the 17th credit hour, the first credit hour with a fee attached for George Mason, and the last "free" hour for students at Temple. Number-wise, Temple has four times more students enrolled in 17 credit hours than George Mason does. This sort of comparison is not specific to these two schools.

Grand Valley State University exhibits another significant affect a credit hour cap can have on student behavior. The Michigan-based university runs under a 12 to 15 credit hour Tuition Band model, and it has the second highest percentage of full-time students—37 percent—enrolled in 15 credit hours out of the complete data sample. Furthermore, only 13 percent of the school's full-time students enroll in more than 15 credit hours. With some students needing additional hours because of changed majors, it is safe to say that more than 13 percent of students at Grand Valley State will have to enroll in a larger than average

Figure 12: Enrollment in more than 18 Credit Hours



Source: Authors' findings .

course load in order to graduate on time. Unfortunately, the current Tuition Band model does not cheaply accommodate this and many students will presumably take more than four years to graduate. Nevertheless, 52 percent of Grand Valley State's graduates take more than four years of schooling.[27]

Ohio University provides insight into the differences in the Tuition Band models. Ohio is unique in that it charges its tuition under a flat rate for 12 to 20 credit hours. Although 20 credit hours is a high amount, Figure 12 shows that Ohio's students take advantage of the high credit hour ceiling.

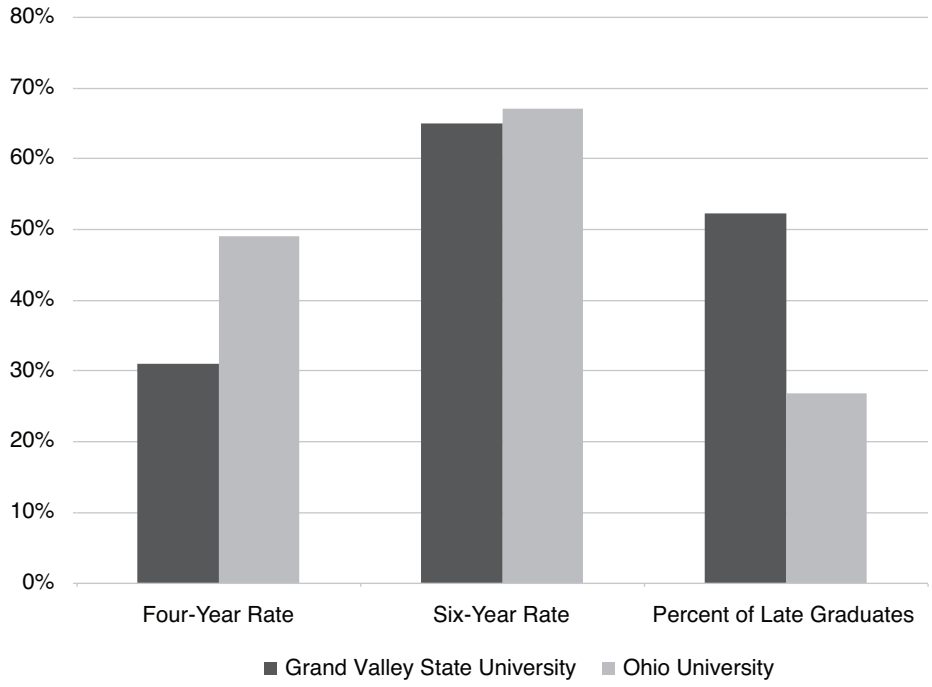
Ohio has more students—1138—enrolled in more than 18 credit hours than these other seven well-respected universities, combined—1058. That is particularly impressive in that several of those schools (e.g. Ohio State, Michigan) have larger enrollments. Of the complete data sample, Ohio touts the largest percentage of full-time students enrolled in more than 15 credit hours at 47 percent. Table 5 compares Ohio and Grand Valley State's incoming student level and prestige. Figure 13 shows the differences in graduation rates and Figure 14 depicts the contrasting enrollment trends between the two schools.

Table 5: Grand Valley State vs. Ohio University

School	Tuition Model	ACT Composite Range	Forbes Ranking
Grand Valley State	12 to 15	21-26	537
Ohio University	12 to 20	22-26	407

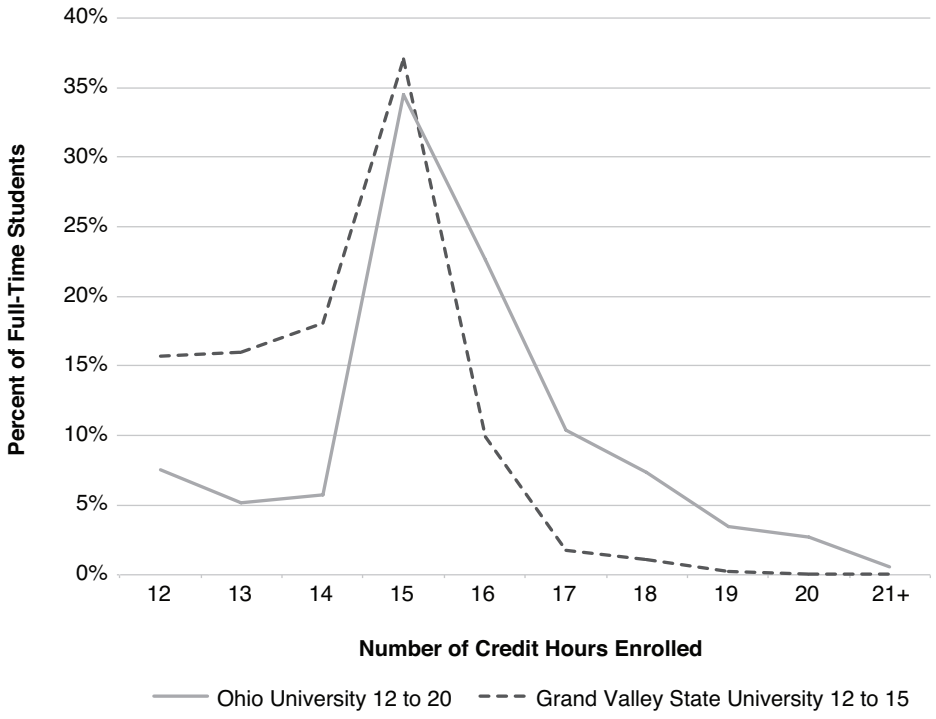
Source: Forbes rankings.

Figure 13: Grand Valley State & Ohio University Graduation Rates



Source: IPEDS.

Figure 14: Grand Valley State & Ohio University Fall Enrollment Trends



Source: Grand Valley State and Ohio University Offices of Institutional Research.

As seen in Figure 13 and Figure 14, the difference in the credit hour gap affects enrollment trends, and subsequently lowers four-year graduation rates. Grand Valley State's four-year graduation rate is 18 percent lower than Ohio's, but the school's six-year rate is just 2 percent shy of Ohio's 67 percent. Roughly the same percentage of students are getting to the finish line but students at Ohio are reaching it much sooner.

Successes of the Unlimited Model

There is considerable evidence that students take advantage of the unlimited model.

Table 6 shows the schools with the highest percentage of full-time students enrolled in 18 or more credit hours. Note that none of them are Credit Hour model schools, and almost all use the Unlimited model or have a very wide Tuition Band model.

The hypothesis that students at Credit Hour schools have less incentive to enroll in large course loads also holds true. Table 7 displays the ten schools in the dataset with the highest percentage of full-time students enrolled in just 12 credit hours.

Table 6: Percentage of Full-Time Students Enrolled in 18 or More Credit Hours

Rank	School	Model	18+ Credit Hours
1	Northwestern State University of Louisiana	12+	20.5%
2	Virginia Polytechnic Institute and State University	12+	15.0%
3	Ohio University-Main Campus	12 to 20	14.0%
4	University of Kentucky	12+	14.0%
5	Iowa State University	12+	13.1%
6	Bowling Green State University-Main Campus	12 to 18	11.5%
7	Purdue University-Main Campus	8+	11.5%
8	North Dakota State University-Main Campus	12+	11.5%
9	University of North Dakota	12 to 21	11.5%
10	New Mexico State University-Main Campus	15+	11.2%

Source: Authors' findings.

Table 7: Percentage of Full-Time Students Taking 12 Credit Hours at All Schools

Rank	School	Model	12 Credit Hours
1	Metropolitan State University of Denver	12 to 18	41.1%
2	University of Houston	Credit Hour	36.5%
3	Weber State University	12 to 18	35.4%
4	University of Colorado Denver	Credit Hour	35.2%
5	University of Missouri-Kansas City	Credit Hour	33.6%
6	Wichita State University	Credit Hour	33.6%
7	Oakland University	Credit Hour	33.2%
8	Wayne State University	Credit Hour	32.0%
9	Georgia State University	Credit Hour	30.8%
10	University of Nevada-Las Vegas	Credit Hour	30.5%

Source: Authors' findings.

Credit Hour schools make up eight of the ten schools with the highest percentage of students enrolled in the minimum course load for a full-time student.

Private Schools

We did not intend for private schools to be a focus in the study, but after seeing the enrollment trends at public schools, we requested enrollment information from roughly 15 private institutions. Six schools responded to the request with complete data.

Four out of the six private institutions submitting complete data are in the top five for percentage of full-time students enrolled in 18 credit hours. The sensitivity to the tuition model appears greater among the private schools, no doubt in large part because tuition fees are much higher on average at private institutions.

Table 8: Percentage of Full-Time Students Taking 18 Credit Hours—Including Private Schools

Rank	School	Model	18 Credit Hours
1	Ohio Northern University*	12 to 19	17.6%
2	Xavier University*	12 to 18	14.6%
3	Case Western Reserve University*	12+	13.5%
4	Northwestern State University of Louisiana	12+	11.4%
5	Dennison University*	12 to 18	11.4%
6	Virginia Polytechnic Institute and State University	12+	10.2%
7	Bowling Green State University	12 to 18	10.2%
8	Indiana State University	12 to 18	9.2%
9	Iowa State University	12+	9.2%
10	University of Kentucky	12+	9.0%

* = Private Institution.
Source: Authors' findings.

Section VIII:

Conclusion

This investigation confirms the validity of the most fundamental of all economic principles: the Law of Demand. When the price of something falls, people buy more of it. When the marginal cost to the student of taking a course falls to zero, many students do it. Thus the abandonment of the Credit Hour model is accompanied by higher student course loads, and, as a consequence, higher four year graduation rates.

From a broad societal perspective, allowing students the opportunity to take additional courses for "free" increases four-year graduation rates, and increases the utilization of productive young human capital. In many respects, our young people in college are operating below their human capital capacity—the "human capital utilization rate" is low. Wide Tuition Band or Unlimited tuition fee models are useful in dealing with this problem. They, of course, are no panacea. If, as students take more hours, the quality of the work effort associated with each hour of class declines, little gain likely will occur, but we have no evidence that that is the case. Institutional objectives—maximizing revenue—might conflict with social gains associated with earlier graduation, but in the long run school reputations are enhanced with high graduation rates—which also help lower the cost to degree to students, who can more quickly join the labor force and contribute importantly to society. Overall, the wide Tuition Band/Unlimited tuition fee model approach is highly desirable.

Notes

1. See “Four-Year Myth”, Complete College America, p.5. December 2014. http://completecollege.org/wp-content/uploads/2014/11/4-Year-Myth.pdf

2. See the National Center for Education Statistics’ “Institutional Retention and Graduation Rates for Undergraduate Students”, updated May 2015. http://nces.ed.gov/programs/coe/indicator_cva.asp

3. See The Institute for College Access and Success’s “State by State Data”. http://ticas.org/posd/map-state-data-2015

4. Michael Mitchell and Michael Leachman, “Years of Cuts Threaten to Put College Out of Reach for More Students,” May 13, 2015. http://www.cbpp.org/research/state-budget-and-tax/years-of-cuts-threaten-to-put-college-out-of-reach-for-more-students#_ftn2.

5. Mitchell and Leachman. http://www.cbpp.org/state-funding-for-higher-education-remains-far-below-pre-recession-levels-in-most-states.

6. Nico Savidge, “UW-Madison facing $58.9M cut in state aid,” Wisconsin State Journal, July 7, 2015.

7. Stephen Burd,“The Out-of-State Arms Race”, New America, p. 5, May 2015. https://www.newamerica.org/education-policy/out-of-state-student-arms-race/.

8. Kelley Holland, “The High Economic and Social Costs of Student Loan Debt”, CNBC.com, June 15, 2015. http://www.cnbc.com/2015/06/15/the-high-economic-and-social-costs-of-student-loan-debt.html.

9. Michigan State University charges a difference tuition price for lower and upper division courses. $478 reflects the mean of the two values.

10. Taken from University of Houston’s website; http://www.uh.edu/provost/student-success/policy-updates/drop-withdraw/.

11. p.6, “Four-Year Myth,” Complete College America.

12. Calculated by authors. Source: “Four-Year Myth”, Complete College America, p.6.

13. Tuition prices for lower and upper division courses are averaged. Annual 2.67% increases in tuition at both Michigan and Michigan State are factored in.

14. Calculated by authors. Source: National Center for Education Statistics.

15. Silas Allen, “OU announces flat-rate tuition plan for undergraduates,” The Oklahoman, June 20, 2013.

16. Katie Bergum, “OU grants 86 percent of flat-rate tuition appeals,” OU Daily, January 26, 2014.

17. Silas Allen, “University of Oklahoma sees benefit of flat-rate tuition policy,” The Oklahoman, October 17, 2013.

18. Taken from the Ohio State University’s website; http://registrar.osu.edu/policies/feesexplanation.asp.

19. Kent State University switched from an Unlimited model to a 12 to 17 Tuition Band model in 2012, and then dropped to a 12 to 16 Tuition Band model in 2013.

20. IPEDS reports that the national six-year graduation rate at public four-year universities was 58 percent in 2013. Complete College America reports that public flagship four-year universities have 36 percent four-year graduation rate and non-flagship four-year universities have a 19 percent four-year graduation rate.

21. “Percentage of students” only records first-year full-time students.

22. The percentage of a school’s students receiving Pell Grant aid was used to adjust for family income.

23. Values taken from university webpages.

24. Some schools operating the Credit Hour model slightly decrease the cost-per-credit hour as a student enrolls in more credit hours. This explains the Credit Hour model's line trending subtly downward.

25. Calculated by the authors.

26. Kent State historical graduation rates found on university webpage.

27. IPEDS.