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Cover Page Footnote

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Intended and Unintended Consequences of For-Profit College Regulation: Examining the 90/10 Rule

By James Dean Ward

The 90/10 rule dictates that no more than 90 percent of institutional revenue at a for-profit college or university (FPCU) can come from Title IV funds. The rule, originally an 85/15 ratio, was introduced in the 1992 amendments to the Higher Education Act and has been debated for 25 years. Proponents argue the rule raises institutional quality by eliminating low-quality institutions from the market, while opponents suggest that the rule creates perverse incentives for FPCUs to exclude high-need students and to raise prices. The author uses propensity score matching to estimate the effects of violating the 90/10 rule and the plausibility of these outcomes. The author provides minimal evidence that FPCUs raise tuition as a result of violating the rule, some evidence that Hispanic students may be excluded, some evidence of an increase in the number of certificates awarded, and strong evidence that violating schools are more likely to close.

Keywords: *For-profit colleges, Regulation, Federal student aid, 90/10 rule*

For-profit colleges and universities (FPCUs) have been part of the American educational landscape for nearly 200 years (Angulo, 2016), yet there is still a dearth of research providing a thorough understanding of this group of institutions. Specifically, the role of FPCUs in financial aid markets has been somewhat neglected by the research community. What has come to be known as the “90/10” rule is more than 20 years old, yet my review of the literature produced minimal research explaining the reasoning and outcomes of this regulation. FPCUs receive revenue from federal grant aid awarded to students, federal loan aid awarded to students, state financial aid awarded to students, institutional grants, third-party scholarships awarded to students, and out-of-pocket payments by students. The 90/10 rule is a federal statute that dictates a maximum of 90% of a proprietary school’s revenue can come from Title IV federal student aid: Pell Grant, Academic Competitiveness Grant, National SMART Grant, Federal Supplemental Educational Opportunity Grant, Federal Work-Study, Federal Family Education Loan, Direct Loan, and Federal Perkins Loan. Ten percent of funds must come from other sources (Lee & Looney, 2019). Some have speculated that this 90% cutoff has resulted in FPCUs attempting to game the system and manipulate their 90/10 ratios (Kantrowitz, 2013). This is unsurprising given that institutions near the 90% threshold are highly dependent upon Title IV funds and thus must maintain access in order to survive. The present study examines the potential consequences of violating the 90/10 rule.

Over recent decades, higher education has become increasingly subjected to accountability measures (Kelchen, 2018). These measures, enacted at both the state and federal levels, have targeted all sectors of postsecondary education. For example, at the state level, performance-based funding has resurged as an

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accountability-focused mechanism of funding public colleges. Although intended to improve institutional performance, performance-based funding has been shown to produce gaming activities across sectors (Dougherty et al., 2016). In response to being funded based on outcomes, there is evidence that colleges will maximize revenue through strategic institutional changes. Colleges have been shown to reduce the number of low-income and historically underserved students – who, on average, have a lower proclivity of persisting and graduating – to increase or maintain funding under the performance policies (Dougherty et al., 2016; Kelchen & Stedrak, 2016; Umbricht, Fernandez, & Ortagus, 2017). Community colleges have also refocused efforts towards moving students through short-term certificates in lieu of longer-term associate degree programs in an effort to increase the number of completions and thus the amount of funding (Hillman, Fryar, & Crespín-Trujillo, 2017; Hillman, Tandberg, & Fryar, 2015; Li & Kennedy, 2018). Although performance-based funding operates differently than the 90/10 rule and targets a different sector of institutions, the unintended consequence of colleges and universities gaming the system to maximize revenue is a universal concern. As governments continue trying to improve institutional performance through accountability measures, it is important to consider and examine the potential unintended consequences of such policies.

To engage in a discussion regarding the utility and potential unintended consequences of the 90/10 rule, a thorough understanding of how schools respond to changes in and rely upon federal aid is needed. I explore the history of the 90/10 rule and the arguments supporting and against it. If the goals of the 90/10 rule are to protect students, preserve Title IV funds, and drive low-quality FPCUs out of the market, it is useful to expand the research evaluating this regulation. In the current literature there is little conclusive evidence that the 90/10 rule is either effective or ineffective, but there are concerns about the potential negative externalities of the policy. I employ resource dependence theory to better understand the relationship between FPCUs and the federal government, and the role financial dependency plays in organizational behavior. Using a propensity score matching technique, I estimate the impact that violating the 90/10 rule has on student demographics, programmatic offerings, tuition setting, and school closure. I present these models and discuss the potential implications of the findings for policy and for-profit institutions.

History and Regulation of FPCUs

In 1835, Benjamin Franklin Foster founded what is thought of as the first proprietary school in America called Foster's Commercial School of Boston (Imagine America Foundation, 2007). Since then, for-profit education has proliferated, specifically since the 1970s. During the 1970s and 1980s, for-profit colleges became eligible to receive federal student aid dollars and also gained access to many state-level aid programs (Angulo, 2016). The ability for students to now use their educational grants and loans at proprietary institutions fueled the growth of the for-profit sector and shifted their revenue sources from predominantly private dollars to federal aid (Hawthorne, 1995). The access to aid not only increased the number of potential students for-profit colleges would attract, the increased demand led to a proliferation in the number of institutions – specifically exploitative colleges. By the end of the second decade, nearly 2 million students enrolled in roughly 4,000 for-profit colleges (Lee & Merisotis, 1991).

Growth in recent decades has been primarily through the enrollment of nontraditional students. Typically these students are working full-time, have children, are over the age of 25, and are among the most disadvantaged members of society (Deming, Goldin, & Katz, 2013; Iloh, 2014). FPCUs have historically offered a range of credentials including certificates and diplomas (Angulo, 2016). In recent years, FPCUs have been offering increasing numbers of associate, bachelor's, master's, and doctoral degrees (Hentschke, Lechuga, & Tierney, 2010).

In the late 1980s, the Government Accountability Office (GAO) found that three quarters of the federal student aid fraud cases involved FPCUs (Beaver, 2012). To address these issues, the 1992 reauthorization

included new regulations for the industry, including the 85/15 rule, which became the 90/10 rule in the 1998 reauthorization (Pelesh, 2010). The rule states that no more than 90% of a for-profit college's revenue could come from federal funding sources (both loans and grants) if the institution received funding under Title IV of the Higher Education Act (HEA). The purpose of this rule is to prevent low-quality FPCUs from existing solely on federal aid (Swenson, Warren, & Boggs, 2005). By driving low-quality institutions out of the market, the 90/10 rule meets its broader goal of protecting students and taxpayers from these institutions. The rule has been challenged by some conservative politicians as unfairly applied to FPCUs only, while many liberals in Congress seek to maintain and strengthen the rule (Kantrowitz, 2013). Since its implementation, 90/10 has been a point of partisan debate within higher education legislation (Kelchen, 2018).

The 10% requirement is not for each individual student, but as an aggregate (Skinner, 2005). For example, an institution of 100 students can have 50 students who pay 100% of tuition and fees via Title IV funds and 50 students who pay 100% via personal savings. This institution would then have a 90/10 ratio of 0.5 as half of the revenue generated from all 100 students is coming from Title IV funding. The fact that half of the students are funding all costs via federal aid is irrelevant as the rule only pertains to aggregate values.

The intention was if only 90% of revenue could come from Title IV funds, the remaining 10% would come from private sources (e.g., private loans or student out-of-pocket payments); however, one significant exception undercuts this logic. Student aid dollars awarded to veterans and their families are not awarded under Title IV of the HEA and are thus not included in the federal aid amounts (Pelesh, 2010). If 75% of students at an FPCU pay their entire tuition and fees through Pell grants and the remaining 25% are veterans who pay for their education through Department of Defense funding, the institution's 90/10 ratio would be 0.75 even though 100% of funding is coming from the federal government. Closing this loophole has been contentiously debated in Congress for years (Lee & Looney, 2019).

It is also important to note that institutional scholarships do not count toward revenue. The 90/10 rule explicitly states that the ten percent of non-Title IV revenue must come from external sources (Skinner, 2005). It prevents institutions from quoting an extremely high tuition price and giving every student a proportionally large scholarship. If internal scholarships, or discounting, were not explicitly excluded, only a foolhardy institution would ever be in violation of the rule. There are, however, other ways FPCUs can game the system. For-profit colleges can collect revenue from auxiliary services, such as the book store or selling services, although these revenue streams are often small (Ruch, 2001). While not a major revenue stream, even a small change in the auxiliary revenue can lower an institution's 90/10 ratio by a couple percentage points, which is important given how close to the threshold many institutions are. There are also reports of FPCUs delaying the receipt of federal aid dollars from students to avoid counting the funds for the current year and raising its 90/10 ratio (U.S. Senate, 2012).

If an institution violates this rule or other federal regulations, it jeopardizes its eligibility to receive Title IV funds. In this way, federal student aid acts a lever policymakers can use to guide institutional behaviors. Given the high default rates (Hillman, 2014; Mettler, 2014; Cellini & Darolia, 2015; Looney & Yannelis, 2015) and high unemployment (Deming et al., 2012) among FPCU students, it is not surprising that they have been the focus of much regulatory attention (Taylor, 2010).

The Importance of Federal Student Aid

A significant portion of student aid research focuses on student outcomes. Federal aid programs have been demonstrated to increase access, persistence, and completions (Dynarski & Scott-Clayton, 2013). Other research focuses on the long-term outcomes of student aid including the increased likelihood of student loan default by students of color (Woo, 2002), those with low high school achievement (Dynarski, 1994), and noncompleters (Hillman, 2014).

Ozan Jaquette and Nicholas Hillman (2015) begin to connect these student outcomes to the supply of student aid. The authors find that, overall, there has been an increase in the student aid dollars that flow through postsecondary institutions that produce a higher share of student loan defaults. However, despite the fact that for-profit colleges receive disproportionate amount of federal student aid dollars (Deming et al., 2012), there has been a reduction in the portion of student aid dollars flowing through FPCUs with cohort default rates higher than 30% (Jaquette & Hillman, 2015). The authors suggest that federal regulations on for-profit colleges' cohort default rates may be part of the reason for this. In the present study, I add to this literature by estimating the effect of another FPCU regulation, the 90/10 rule, on institutional behavior.

Federal student aid is important for institutions as well as students. Federal financial aid makes a postsecondary education more accessible to low-income students (Dynarski, 2002; Kane, 2003). Without students, colleges would cease to exist. For-profit colleges, who often seek profits through the enrollment of large numbers of students (Tierney & Hentschke, 2007), are particularly reliant upon federal aid. The presence of the 90/10 rule is an indication of this; the vast majority of revenue at FPCUs is derived from Title IV sources, as shown below. As Rajeev Darolia (2013) finds, when for-profit colleges become ineligible for Title IV programs due to cohort default rate violations, new student enrollment immediately falls by 18% and decreases by nearly 25% in the long-run.

In addition to FPCUs losing students because of limitations on federal aid availability, for-profits actively react to other changes in aid policy. For example, FPCUs raise tuition in order to capture increases in aid amounts (Cellini & Goldin, 2014; Lau, 2014; Lucca, Nadauld, & Shen, 2015). These quick responses to policy changes reflect the overall nature of for-profit colleges as “nimble” organizations (Deming et al., 2012). This echoes the findings of regulatory investigations that FPCUs actively game the financial aid system (Taylor, 2010). This gaming is particularly important for the study at hand.

The importance of federal student aid dollars for institutions underscores one major criticism of the 90/10 rule: that it unfairly targets for-profits and should apply across all sectors (Hentschke et al., 2010). Critics of the rule argue that FPCUs are not alone in their government reliance and thus it is illogical to target these institutions. A recent study tested the disproportionate impact and found that 97 percent of nonprofits would pass the 90/10 rule. Moreover, the authors find that FPCUs with 90/10 ratios over 0.8 have a loan default rate more than double the average for nonprofit colleges, and that low-income students are clustered in the for-profit sector among schools with the highest 90/10 ratios as compared to being clustered in the nonprofit sector among schools with the lowest ratio (Lee & Looney, 2019). Although critics suggest the 90/10 rule unfairly targets FPCUs, evidence suggests that the schools currently impacted – which have some of the worst student outcomes – are those that would continue to be affected if it were applied universally. The present study contributes to the understanding of the 90/10 rule by estimating the effects of violating the rule.

Theory of Action

In order to understand the potential gaming and unintended consequences, it is useful to examine the full theory of action underlying the 90/10 rule. Couched in a principal-agent relationship between the federal government (principal) and FPCUs (agents), we can further understand the government-institution relationship by examining the role of dependency. These theories are elucidated below to provide a full understanding of the problem at hand.

The Principal-Agent Relationship

Like many regulations, the 90/10 rule seeks to control the behavior of firms. This can be readily explained through principal-agent theory (PAT). The basis of PAT rests in the fact that an entity, the principal, cannot or chooses not to conduct some action and thus contracts to another entity, the agent, to do so (Lane & Kivisto, 2008). The contract between the principal and the agent, however, is undermined by the fact that

the agent is self-interested and may not act how the principal would (Moe, 1984). That is, the agent is a rational actor seeking to benefit himself despite being contracted by the principal. Moreover, information asymmetry results in the principal being unaware of the specific actions of the agent. To ensure the agent acts in accordance with the principal's wishes and alleviate problems of information asymmetry, oversight mechanisms are used to guide the behavior of the agent (Lane & Kivisto, 2008). The relationship between the Federal Department of Education and colleges and universities often takes a principal-agent form.

The federal government is tasked, to an extent, with the provision of education. While education is to be directly provided by states or private institutions, subsidies from the federal government make this possible. One way this relationship manifests is the federal-level Department of Education's provision of financial aid to students in the form of loans and grants. The Department provides this money to colleges, through students, to use to fund education for its citizens. In exchange for this funding, the federal government expects students to be well educated to contribute to society (Brubacher, 1997). To ensure the agents, postsecondary institutions, act in the interest of the principal, the government, the Department of Education creates and enforces regulations that guide the behavior of colleges and universities (Kelchen, 2018). These regulations are the manifestation of explicit contracts between the principal and agents (Lane & Kivisto, 2008).

The principal-agent relationship and the effectiveness of contracts hinges on the principal having power over the agent. Drawing on the organizational theory of resource dependence, when a focal institution is dependent on an external entity for resources, that external entity holds power over the focal organization (Pfeffer & Salancik, 2003). In the case of regulation tied to Title IV access, this power is centered upon access to resources. Most colleges could not survive without access to federal student aid programs. These programs enable students to pay for postsecondary training and comprise large portions of many institutions' budgets. This dependence is particularly important for FPCUs, specifically those violating the 90/10 rule. As previous findings confirm, access to federal aid is crucial for maintaining enrollments (Darolia, 2013), thus making Title IV programs a useful policy lever. By definition, schools violating this rule receive more than 90% of their revenue from Title IV sources. Increased dependence upon the federal government gives regulation more power and provides more nuance to the individual principal-agent relationships that exist between government and each college. In this way, resource dependence can help elucidate individual principal-agent relationships. Institutions more dependent upon Title IV funding are theoretically more likely to devise ways of complying with regulations that threaten access to such funds. As discussed below, there are multiple tactics a college can take to shift its 90/10 ratio; all of which would be expected under this theoretical framework.

The 90/10 Rule

The 90/10 regulation is an attempt by the federal government to align the behaviors of for-profit colleges with its own goals. It is expected that if a college exists solely on federal student aid, the college is likely to be providing a subpar education. Because FPCUs are profit-seeking firms, they should charge the maximum amount consumers are willing to pay. If a degree from the institution is worthwhile, consumers would be willing to pay for that degree because it will expand their economic prospects after graduating. Thus it follows that if a for-profit college is unable to provide a good that students are willing to pay, the school must not be providing a worthwhile education. The federal government uses the percent of total revenue that comes out of students' pockets as a proxy for students' willingness to pay for the degree and, in turn, the quality of the degree. Specifically, the government has decided that 10% is an adequate portion of revenue to come out-of-pocket from students to deem a school's programs worthwhile.

The 90/10 rule is an example of the oversight mechanism that is central to PAT. The Department of Education seeks to ensure only high-quality institutions remain in the market in order to meet the government's goal of providing useful training to students. In theory, the 90/10 rule should align FPCUs'

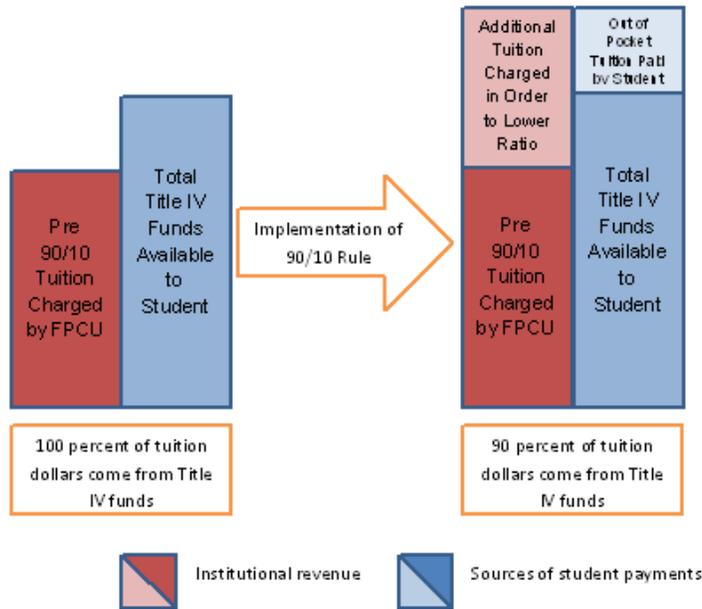
goals with the government's. The rule should induce institutions to offer worthwhile programs that provide benefits to students large enough that students are willing to contribute their own funds to their investment in education. Moreover, by improving the quality of institutions within the marketplace, the goal of the rule is to protect students and taxpayers. Because higher education is an experiential good, typically only purchased once, maintaining quality is critical to protecting consumers from fraud. By ensuring low-quality institutions are driven out of the market, the rule seeks to ensure students are investing in a useful credential. Similarly, as most for-profits are highly reliant on federal student aid dollars, the elimination of low-quality schools will prevent tax dollars being spent at fraudulent and exploitative proprietary colleges.

Potential Externalities

Opponents of the rule cite the unintended consequences of 90/10 as reason to eliminate or adjust it. Specifically, for institutions that are approaching the 90% threshold, it is advantageous to increase tuition costs and require students to pay additional amounts out of pocket to meet the requirement (Kantrowitz, 2013). FPCUs argue that institutions with a 90/10 ratio over 0.9 would then be incentivized to raise tuition so fewer students would be able to cover all or nearly all the costs with financial aid and instead pay out of pocket. For example, if an FPCU offers one degree program with an annual tuition of \$5,000 and almost all the students enrolled come from low-income backgrounds and qualify for the full Pell grant award (which is greater than \$5,000), the 90/10 ratio for the institution would be 1.0. This school would be in violation of the rule and would lose Title IV eligibility. However, if the FPCU raises tuition to a level where the maximum Pell grant (and any other Title IV aid for which a student is eligible) is less than 90% of tuition, the school would no longer be violating the 90/10. However, an unintended consequence is that tuition is higher, and students would have to find additional funds beyond their Pell grant award to pay for tuition. By raising tuition this high, students would have no option but to pay out of pocket, thus decreasing the institution's 90/10 ratio. Figure 1 shows how the 90/10 rule potentially causes increases in tuition.

Figure 1

Purported Impact of the 90/10 Rule on FPCU Tuition Prices



As an alternative to raising tuition, opponents to the rule argue that proprietary institutions may respond by admitting fewer financially needy students who often receive all their funding from Title IV funds. FPCUs enroll more well-off students to balance the 90/10 ratio by offsetting students who pay for 100% of

tuition and fees with Title IV funds with those who are only eligible for lower levels of federal funding and therefore provide out-of-pocket revenue to the FPCU to pay their remaining tuition costs (Skinner, 2005). Mark Kantrowitz (2013) finds that students with an estimated family contribution (EFC) of \$1 to \$2,499 receive 98% of their educational costs from the federal government, on average, and those with an EFC of zero have a 90/10 ratio of 100%. If for-profit schools limit the enrollment of these students to stay below the 90% threshold overall, the rule's unintended consequence will be to limit the opportunities of the neediest members of society. Moreover, students of color are more reliant upon Title IV funds, thus this tactic would disproportionately harm them (Kantrowitz, 2013).

FPCUs may also tailor program offerings to attract more well-off students in order to balance 90/10 ratios. Applying the same off-setting logic as above, however, rather than simply admitting fewer low-income students, the school would add additional high-cost programs, programs that attract higher income students, or eliminate programs that attract low-income students (Skinner, 2005). Another potential tactic is the increased reliance on short-term programs. Certificates that take fewer than two years provide quick turnover in student populations. By relying on these short programs, a for-profit college can have greater control over its 90/10 ratio. Enrolling students in four-year programs gives the college less flexibility in quickly adjusting its student body and thus its revenue sources.

Institutions charging an average of less than \$8,000 in tuition and fees have a 90/10 ratio over 90%. Critics of the rule claim it behooves institutions to raise tuition in order to avoid crossing the 90% threshold. These extremely low-cost schools are predominantly populated by low-income students whose federal aid is often high enough to cover all the costs of the program. They argue that schools charging such a low tuition that students' Title IV funding award covers all or nearly all the costs would be forced to raise tuition higher than financial aid awards in order to comply with 90/10 rules. This would increase the impact on low-income students and limit the number of low-cost options for students (Kantrowitz, 2013). For especially low tuition programs that are completely covered by federal grant awards, this would mean having to raise tuition high enough to surpass the grant award and the possible federal loan awards. This would impose a loan burden on these students and require them to pay costs out of pocket in order to reduce the institution's 90/10 ratio.

It is also important to note that postsecondary funding made available to through the Veterans' Administration (VA) do not count toward a school's Title IV revenue total as these funds are administered outside of those programs included in Title IV of the Higher Education Act. This allows FPCUs to enroll military students, or their families, who receive these benefits in order to decrease the reliance on Title IV funds. This is known as the "VA loophole" and is a potential strategy FPCUs use to avoid a 90/10 violation. The VA funds do come with their own set of guidelines and regulations; however, these are beyond the scope of the present study.

The present study seeks to evaluate the plausibility of these externalities. By deriving estimates of the impact of violating the 90/10 rule, I will assess the effects of rule violation on the enrollment of racial and ethnic minorities, low-income students, tuition prices, and degree composition. These findings have both policy and equity implications. Understanding the potential unintended financial consequences of the 90/10 rule is important because of the potential for inefficient uses of federal student aid at for-profit colleges. Moreover, equitable access to postsecondary training warrants a more complete understanding of the impacts of federal regulations on the enrollment of low-income students and underrepresented minorities. In the remainder of the paper I will explain my analytic strategy, present findings, and discuss the implications for students, institutions, and policy.

Empirical Strategy

Data

To evaluate the 90/10 rule and the impacts of violating this regulation, I turn to institution-level administrative data gathered by The Institute for College Access and Success (IICAS) in its College InSight tool. Variables used in this study are taken from the Integrated Postsecondary Education Data System (IPEDS) and Department of Education Pell grant files. This data was then merged with annual Department of Education files that list the 90/10 ratio of Title IV eligible proprietary schools. The Department calculates these ratios based on mandatory institutional reporting in order to assess each school's compliance with the rule. At the time of conducting this study, ratios were available for academic years 2007-08 through 2013-14, thus the sample is limited to these years. Financial data is adjusted to 2014 dollars using a consumer price index scalar. Additionally, I took the log of the number of students receiving Pell grants in order to normalize the data for regression models.

Table 1 presents descriptive statistics of FPCUs during the seven-year sample. The variables included are those used in the matching process – to be described below – and the relevant outcomes metrics. The data are pooled across years for each institution. The data are segmented into three groups: the full population, schools that violated the 90/10 rule, and schools that meet the common support assumptions in the matching technique. For the purpose of this study, institutions that violate the 90/10 rule are considered the treatment group. The treatment in this case would be a warning from the Department of Education and the risk of losing Title-IV access if the violation persists the following year. The treatment group is any school that violates the rule during the study period and thus faces sanctions from the Department. As expected, the matched comparison group is more similar to the treatment group (i.e., institutions that violated the rule) than the population at large. The total sample includes 1,760 institutions for which full data was available. Of these, 55 schools were in violation. Using the matching technique described below, a control group consisting of 712 FPCUs was selected. Not unsurprisingly, the control group is more similar to the violating schools than the full sample. This is done purposefully through the matching technique to compare the outcomes of colleges which are similar to those that violated the rule.

Table 1

Summary Statistics

	<u>Full Population</u>		<u>Violators</u>		<u>Control Group</u>	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Violation	0.031	0.174	1.000	0.000	0.000	0.000
Percent of Students who are Over 25	0.473	0.184	0.546	0.137	0.528	0.158
Percent of Awards at the Associate Level or Below	0.608	0.167	0.621	0.137	0.609	0.154
Cost of Attendance	14236	5662	14636	6782	14394	5342
90/10 Ratio	68.9	14.6	85.9	3.6	80.8	4.1
Log Number of Pell Recipients	4.838	1.209	5.597	1.171	5.302	1.184
Highest Degree is Less Than 2 Years	0.088	0.283	0.091	0.290	0.084	0.278
Highest Degree is Less Than 4 but 2 Years or More	0.303	0.460	0.364	0.485	0.327	0.470
Highest Degree is 4 Years or More	0.609	0.488	0.545	0.503	0.588	0.492
Percent of Students who are White	0.515	0.308	0.235	0.265	0.391	0.294
Total Number of Institutions	1760		55		712	

For-profit colleges are clearly heavily reliant upon federal aid. On average almost 70% of revenue comes from Title IV sources, with the violating and control groups significantly more dependent. As described above, this dependency is a critical aspect of organizational behavior. As indicated by the large standard deviations, there is large variation in both the number of students receiving Pell grants and in tuition and fees. This reflects the diversity of institutions in the sector. FPCUs include small “mom and pop” institutions training local community members in a trade and large, high-volume institutions such as University of Phoenix which enroll significant numbers of in-person and online students. These varied institutions offer a range of programs, some of which offer low-cost technical training while others may offer high-cost specialty training such as piloting. This variability may be a good reason for equally diverse regulations on the industry, a point to be discussed below.

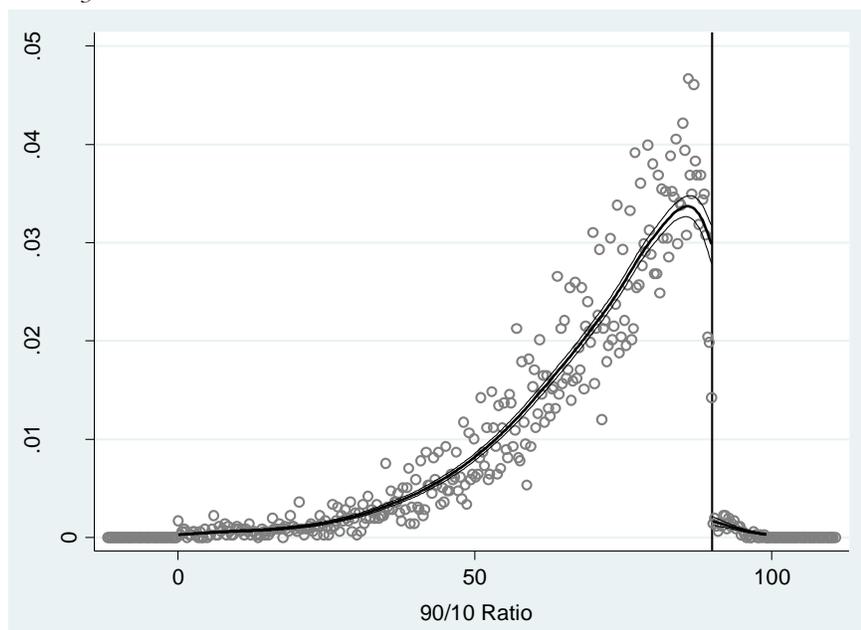
The analysis includes data relevant to five specific phenomena examined in this study: the exclusion of high-need students, the exclusion of underrepresented minorities, the increase of tuition, a shift towards shorter-term programs, and institutional closure. Although the relationship between a school's 90/10 ratio and veterans' funding is also important for public policy consideration, this data is not currently available for analysis.

Methods

The purpose of this study is to assess the impact of violating the 90/10 rule on key institutional outcomes. Given that a school is in violation at the 90% mark, and the violation is true 100% of the time (i.e., if a school crosses the 90 percent threshold, the Department of Education is legally obligated to sanction the institution), a sharp regression discontinuity design appears to be an appropriate approach. A regression discontinuity approach requires that those just above and below a given threshold are as good as randomly assigned to the treatment group. In the case of the 90/10 rule, the treatment would be the governmental sanction associated with violating the rule.

The regression discontinuity design requires that those just below and just above the cutoff are equal in expectation. It would have to be assumed that colleges which maintain a ratio under the 90% threshold are expected to behave the same as schools which violate the rule. But the violation is not randomly assigned; it is a product of an institution's behavior. Given that for-profit colleges closely monitor their 90/10 ratio, schools that violate the rule are likely to differ in some capacity than those that do not. This differentiated behavior among institutions undercuts the plausibility that colleges which are sanctioned for violating the rule are randomly assigned to such a treatment. In such a case there is selection bias into the treatment group. Moreover, the sample fails to pass the McCrary (2008) test, presented in Figure 2. These issues make a regression discontinuity approach untenable, thus I devise a secondary approach to assessing the impact.

Figure 2

McCrary Test: 90/10 Ratio

To minimize the differences between violators and non-violators, I utilize a propensity score matching technique. This method is a common approach when available data are observational. The underlying logic is to examine each treated FPCU, or the group of institutions that violated the rule, and then find untreated schools that are similar (Murnane & Willett, 2002). Specifically, I calculate a propensity score that measures the likelihood of a school ever violating the 90/10 rule. I use the following logistic regression model to estimate this propensity score:

$$\text{Logit}\{\text{Pr}(y = 1)\} = \beta_0 + \beta_1 X + e$$

Where y is a dummy for a school ever violating the 90/10 rule during the observed years and X is a vector of institutional characteristics described in Table 1. This vector uses a broad range of institutional characteristics that vary quite a bit within the FPCU market. Because there is such heterogeneity within the for-profit market, it is important to identify schools that serve similar populations and have similar financial structures. To address this I use student demographics (e.g., percent of adult learners and white students) to more closely match violators with a control group. Nontraditional adult learners often require different accommodations and have different life experiences than traditional students. Similarly, a predominantly-white institution is going to face different challenges than a more diverse campus as will a campus serving more low-income students than middle- and upper-income students. Student demographics are also closely related to levels and reliance upon federal student aid, which is of paramount importance for FPCUs when considering their 90/10 ratio. I also focus on the types and mix of degrees offered, as these factors likely play a role in how much turnover in the student population there is, as well as the relative cost of attendance to the student and the cost of providing an education from the perspective of the school. High turnover, linked with a greater share of short-term students, gives colleges more control over their 90/10 ratio as they can more quickly change the types and financial-neediness of students. Finally, an institution's actual 90/10 ratio as well as the cost of attendance, are important indicators of the financial structure of the institution and thus its propensity to violate the rule. Obviously, an institution with a 90/10 ratio of 0.89 is closer to violating than one with a 0.3 ratio.

Based on these characteristics, the model estimates the likelihood of a school violating; this is the propensity score. I use the `pscore` command in `stata` to then match each violating school with institutions that are similar. The control institutions with similar characteristics, and thus similar propensities to violate the rule, fall under the region of common support.

For-profit colleges are nimble; their business model allows them to quickly open and close in order to meet local market demands (Tierney & Hentschke, 2007). It is not unsurprising that longitudinal datasets that include for-profit colleges see institutions enter and exit the market. That is, FPCUs can open and close their doors quickly as demand increases and decreases. The closure of for-profit colleges, which has been well documented in the press, can occur because of a lack of profits, regulatory action, or a strategic decision to relocate or exit a particular geographic market or subject field. Not only is this an important potential impact of a 90/10 violation, the matching strategy must account for the potential impact on the data. I reshaped the longitudinal data from long into wide form and calculated the average value of each predicting variable over the observed years. This provides one value per variable per institution regardless if the institution closed and exited the data. These averages are used to calculate the propensity of a school to ever violate the rule.

Using the `pscore` command, `stata` determined that propensity scores between the treated and control groups are balanced. The propensity scores have a region of common support ranging from 0.0014 to 0.8089. Although the actual 90/10 ratio is the largest predictor of violation and thus violators account for most of the upper bound of the region, violators are still heavily skewed towards the lower bound. The optimal number of blocks was determined to be six. `Stata` reports that propensity scores and mean values for independent covariates are not significantly different across each block at the $p < .05$ level. Upon calculating the propensity to ever violate the rule and identifying the institutions that fall under the region of common support, I reshaped the data back into long form to conduct analyses between the treatment and control groups.

I use panel regression methods to estimate the impact of a violation in a given year on institutional measures in the following year. That is, when a school violates the rule, it is expected that the school will respond in some capacity the following year in order to lower its 90/10 ratio and come back into compliance. The simple form of this regression is:

$$y_{i(t+1)} = \beta_0 + \beta_1 Violation_{it} + e_i$$

Where $y_{i(t+1)}$ is the outcome variable of interest one year following a violation of the rule, $Violation_{it}$ is a dummy variable indicating the school violated the rule in a given year that is coded to equal 1 in the year of a violation and 0 otherwise, and e_i is an error term clustered at the institution level. Clustering the error for each institution controls for autocorrelation in error terms that can be common with panel data (Bertrand, Duflo, & Mullainathan, 2004).

Because the vector of institutional characteristics was included in the logistic regression model used to develop the propensity scores, the panel regression models only include the violation dummy to estimate the effect. While the vector of control variables is not included in this estimation strategy, I make use of fixed effects to control for factors outside of the vector that may influence the outcome variables. Specifically, I utilize institution and year fixed effects. Institution fixed effects, indicated by δ_i , control for time-invariant characteristics of each school that may impact the outcome variables. Year fixed effects, indicated by τ_t , control for macro-level factors to which all institutions are exposed. The model is estimated with each fixed effect individually and then jointly. The fully specified model takes the following form:

$$y_{i(t+1)} = \beta_0 + \beta_1 Violation_{it} + \tau_t + \delta_i + e_i$$

The variable, $y_{i(t+1)}$, changes for each model and represents one of the variables of interest, which are included in Table 2. It is worth noting that all but one of the outcomes are continuous. Exiting the dataset is a binary outcome and thus it modeled two ways. First, I use the above equations to model the linear probability of exiting. Linear probability models, however, face methodological limitations because of the assumed functional form and the inability to bound estimated probabilities to between zero and one (Aldrich & Nelson, 1984). To rectify this, I also conduct a set of logistic regression models to estimate the effect on exiting the dataset. The findings from both models are included below.

Table 2

List of Outcome Variables

Description of Outcome Variable
Cost of Attendance
Number of Associate Degrees and Short-Term Certificates Awarded
Portion of Awards that are Two Years or Less
Log of the Number of Pell Recipients
Number of White Students
Number of Black Students
Number of Hispanic Students
Last Year the Institution is Open

Limitations

There are three important limitations of this study. First, the absence of VA data doesn't allow for an important externality to be tested. While this does not undermine the current study's findings, this is an important topic that should be addressed. Second, this study only evaluates the impact of violating the rule and cannot be used to understand the ongoing effects of constant monitoring of a school's 90/10 ratio. Some negative externalities may not occur acutely, but rather as part of an ongoing strategy used by a for-profit college to remain in compliance. Moreover, the quality of an institution – a direct purpose of implementing the rule – is not measured in this analysis. This study explicitly examines potential effects of violating the rule and does not evaluate the effectiveness of 90/10 to meet its goal of improving institutional quality within the market. Finally, the use of propensity score matching helps in determining the effects of a policy violation. However, because the model is based on observational data, and a comparison group is selected based on observable characteristics, the effects are not truly causal. PSM is helpful in minimizing selection bias but cannot completely eliminate it. As such, the findings should not be seen as causal, but rather as part of the overall body of evidence of policy impacts.

Findings

Four models were run on each outcome variable: the reduced form without any fixed effects, one with institution fixed effects only, one with year fixed effects only, and the final model with both institution and year fixed effects. The effects of violating the 90/10 rule are measured on each outcome variable one year after the violation. For outcomes that are the change in a given variable, it is the change from the year of violation to the year after. The estimated effects in all four models for each outcome are listed in Table 3.

Table 3

Summary of Findings

	Institutional			
	No Fixed Effects	Fixed Effects	Year Fixed Effects	Both Fixed Effects
Cost of Attendance	1138.7 (756.7)	1467.8 (954.2)	1209.8 (756.0)	1586.7+ (959.0)
Number of Certificates Awarded	23.84 (19.04)	28.43 (23.32)	33.70+ (18.67)	46.16* (23.19)
Portion of Awards that are Certificates	0.0348 (0.0351)	0.0516 (0.0464)	0.0108 (0.0244)	0.0156 (0.0302)
Number of Pell Recipients	-30.07 (53.97)	-37.19 (59.53)	1.873 (48.33)	4.088 (56.61)
Number of White Students	-13.61 (11.79)	-9.333 (13.26)	-12.07 (12.81)	-6.373 (14.69)
Number of Black Students	-0.540 (22.56)	-5.584 (25.13)	0.924 (22.82)	-1.396 (25.43)
Number of Hispanic Students	-28.79* (12.86)	-37.96+ (21.11)	-29.69* (12.41)	-37.74+ (20.39)
Last Year (LPM)	0.233*** (0.0556)	0.215*** (0.0563)	0.215*** (0.0552)	0.181** (0.0548)
Last Year (Logit)	9.022*** (2.809)	8.466*** (4.506)	7.764*** (2.671)	4.125* (2.610)

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The first proposition tested regards the tuition and fees an institution charges. There is minimal evidence that FPCUs raise tuition in response to violating the 90/10 rule. There are statistically significant effects in the full model, however, the effects are only significant at $p < 0.1$ level. This suggests the effect may be a false positive. The size of the modeled effect is quite large at \$1,600. Given the large effect size and marginal significance, I cautiously interpret this to be a significant positive effect that is likely smaller than the estimated values.

The second hypothesis tested is related to the composition of programs offered. One potential way of controlling its 90/10 ratio is by increasing its reliance on students enrolled in short-term programs. Because the turnover is so quick in these programs, an institution can adjust the student composition quickly thus limiting the number of Title-IV dependent students if the school needs to lower its 90/10 ratio. My models show evidence that the number of short-term completions increases by roughly 45 students the year following a violation, but there is no evidence that the portion of total awards shifts towards short-term credentials. This may suggest that a small increase in the number of short-term students is enough control for a school to lower its ratio quickly, and that a larger shift in the composition of degrees awarded is not necessary or feasible.

Another way of manipulating its 90/10 ratio may come through the enrollment of specific groups of people. Students more likely to rely on federal aid would increase an institution's 90/10 ratio and thus may be excluded. I test hypotheses related to Pell recipients and students of color but find minimal evidence of exclusionary practices based on these characteristics. The year following a violation shows no change in the

number of Pell grant recipients, White students, or Black students. There is, however, some evidence of decreased enrollments among Hispanic students. All four models show decreases in the number of Hispanic students which ranges from 30 to 40 students. While the full model is only marginally significant, just as the institution only fixed effects model, these two models also show a larger effect size. I believe it is safe to conclude there is some level of exclusion of Hispanic students based on these findings; however, it appears to be limited to a few dozen students. This may suggest this tactic can be effective in the near term through just a small number of students, similar to the changes in the short-term degree students.

The final set of models relates to the potential closure of an institution. I find that a violation of the 90/10 rule increases the likelihood of an institution exiting the dataset by approximately 20% and is significant across all models. Because the limitations of a linear probability model, discussed above, I also estimate the impact of leaving the dataset using a logit model. The findings from this model are presented in Table 3 as odds ratios. This model shows a significant impact across all models, although the final model shows a smaller effect than earlier models. However, the odds ratio is still quite large at 4.125; that is, the odds of a school exiting the data after violating is 4 times those of non-violators. It is important to recognize exiting the data can occur for a number of reasons: school closure, exiting the Title IV program (thus no longer required to submit data to the Department of Education), or being purchased by or merging with another institution. These, and the previously listed, findings are discussed in the context of federal policy and the for-profit college literature below.

Discussion

The principal-agent relationship between the federal government and for-profit colleges manifests, in one way, through regulatory contracts that seek to align goals. Given that federal student aid is the primary mechanism by which the Department of Education can influence for-profit colleges, chiefly because FPCUs are so reliant upon aid, federal regulations typically use access to these funds as a carrot or a stick. The 90/10 rule is one such example. While this rule is intended to force low-quality schools out of the market, critics have cited the potential unintended consequences which carry equity concerns. This study empirically tests the plausibility of these externalities by estimating how institutions respond in the year following a violation of the rule.

Theoretically, it is the reliance on Title IV funding that gives the federal government control and provides the necessary power of regulation. Institutions that are in risk of violating the rule are particularly reliant by definition; that is, they receive more than 90% of funding from Title IV sources, and thus they have greater incentives to adjust their behavior in order to lower their 90/10 ratio. The potential tactics colleges can use vary from trying to change the types of students who are enrolled or change organizational characteristics.

There appears to be limited evidence that FPCUs attempt to change student characteristics. While there is some evidence that enrollment of Hispanic students decreases following a violation of the rule, there does not appear to be significant changes in the number of White or Black students or Pell recipients. This suggests that student demographics may not be a particularly useful or prudent lever for FPCUs to control their 90/10 ratio in the short-run. It is possible that because schools are so reliant on Title IV funding all subgroups of students are highly reliant upon federal aid and thus cannot be individually used as a mechanism of control over the school's ratio. While the exclusion of low-income or students of color due to their higher reliance on federal aid does not appear to be a reaction to violating the rule, the findings of this study cannot rule out this strategy as a general mechanism of actively monitoring and controlling an institution's 90/10 ratio. That is, the exclusionary practices may happen in an ongoing nature prior to violating the rule, thus serving as a preemptive strategy rather than a reactive one.

Another potential mechanism of control is by increasing an institution's reliance on short-term programs. Certificate programs are typically two years or shorter and thus students move through them more quickly and there is greater turnover among students. This turnover potentially allows an FPCU to control who is

enrolled in a given year. While there does not appear to be a large shift in degree composition at schools, there is a slight increase in the number of certificate awards in the year following a violation. As these short-term programs enable an acute change in the ratio, this may serve as a stopgap measure employed by violating universities. Such gaming strategies are like those used by public colleges facing performance-based funding. Although the policy tools and targets are quite different, this study contributes to the growing body of evidence that regulatory policies cause colleges and universities to seek other revenue-maximizing strategies that may be incongruent with policy goals.

There is also a more nefarious potential explanation for an increase in short-term awards. If a violating school does not expect to come back into compliance, increasing the enrollment in short-term certificates is a potential one-year attempt to maximize profits. When institutions close, they are required to devise plans to place their students in other programs. For this reason, enrolling students who will graduate before institutional closure would minimize the number of new students for which this obligation would hold. The findings from this study support the idea that violating institutions are significantly more likely to close than non-violators. Additional investigation into both potential explanations would be an important next step in understanding how FPCUs respond to 90/10 violations.

There is also limited evidence that a school may respond to a violation by rapidly increasing its tuition to force students to increase out-of-pocket expenditures. The potential increase in tuition due to a violation has important equity and efficiency implications. For-profit colleges enroll more low-income and URM students than their nonprofit counterparts (Deming et al., 2012). Moreover, FPCU students, on average, have higher debt totals, default rates, and unemployment rates (Deming et al., 2012). If a violation of the 90/10 rule results in an inflated tuition price for students, the current inequities are potentially being compounded. This rule has the potential to force unnecessary financial hardships on low-income students who attend a for-profit college. While some argue that the inflated tuition price already occurs in an effort to prevent a 90/10 violation, if a violation causes an additional surge in the cost of attendance, student may be unduly harmed. It is also worth considering how students use Title IV funds. Often a student relies on federal student loans to pay for housing and living expenses. If a for-profit college inflates its tuition and fees more than the Title IV allotments in order to remain in compliance, Title IV dollars that could have been used to help students pay for non-tuition expenses may be limited and redirected towards inflated tuition prices. The same phenomenon has the potential to decrease the efficiency of Title IV funding. If the presence of the 90/10 rule, in general, and a violation results in inflated tuition prices, there is the potential for waste in student aid programs. That is, if a college could offer the degree for less, but charges higher tuition to remain in compliance, taxpayer dollars are simply being redirected to for-profit companies as additional revenue. Although the evidence does not strongly support this phenomenon, the marginal significance warrants additional investigation. Moreover, these findings do not speak to the potential ongoing manipulation of tuition prices.

The dependence upon Title IV funds necessitate some form of action from a violating school in order to survive. Without access to resources, the organization will cease to exist. My analysis suggests a significant number of institutions exiting the data following a violation. Some of these schools may shut down due to a lack of financial resources, others may find these resources elsewhere. It is possible that schools in violation are purchased or merge with other colleges to continue to operate; although one could argue this is not actually survival. As Lee and Looney (2019) note, the for-profit colleges most reliant upon federal aid are also those with the lowest loan repayment rates suggesting these institutions do not adequately prepare students for the labor market conditional on the amount of debt they are required to take on in order to obtain the credential. As such, the closure of these institutions may signal the rule is working to eliminate low-quality institutions from the market. The authors also found that Title-IV-dependent FPCUs predominantly serve the neediest students. The closure of predatory colleges that exploit low-income students has the potential to improve the overall opportunities, or at least limit the negative outcomes for these individuals. However, campus closure may come with its own set of negative outcomes and thus

warrants more investigation. These findings reinforce the importance of dependence in policy effectiveness. A deeper understanding to what exactly comes of these institutions, and the students who attend them, is critical to understand. While the present study does not address these issues, it sets the groundwork for future research on the topic.

Implications for Practice

For-profit colleges have faced increased regulations over the past 25 years due, in part, to a series of reports and claims of rampant fraudulent behavior in the sector. These regulations have taken many forms and continue to be debated today. One such policy is the 90/10 rule which seeks to ensure only high-quality programs remain in the market. Regulators assume that if a program is worth the investment students will be willing to pay at least 10% of the costs of education; thus, at least 10% of revenues are required to come from non-Title IV funds. Opponents of the rule worry that the policy incentivizes FPCUs to exclude high-need students or raise prices beyond the amount of federal aid available to maintain a lower 90/10 ratio.

I test these hypotheses and find limited evidence that FPCUs raise tuition one year after violating the 90/10 rule, likely as an effort to quickly lower their ratios. There is also some evidence that Hispanic students may be excluded in response to a violation and that FPCUs seek to increase short-term credentials. These both serve as mechanisms of control over the institution's ratio. I conclude that negative externalities may exist but cannot conclusively validate opponents' concerns. Moreover, it is important to note that this study only examines the impact of a violation. Schools constantly monitor their 90/10 ratio and thus exclusionary practices may be ongoing and much more prevalent. Schools may engage in persistent tuition inflation that has the potential to exacerbate inequality and undermine the purpose of Title IV programs. The findings do suggest that a violation of the 90/10 rule significantly increases the likelihood of institutional closure. Given the poor student outcomes of highly dependent FPCUs, this finding suggests the rule may be effective at driving low-quality institutions out of the market.

Policymakers should consider these findings in relation to the goals of FPCU regulation. The theory of action underpinning the 90/10 rule has been criticized by FPCUs, but this study provides minimal support for these claims. The intended and unintended consequences of the regulations must be evaluated together in the policymaking process to effectively meet socially-optimal policy goals. Individuals working as higher education lobbyists, Congressional staffers, and constituent, public, and governmental relations for national financial aid organizations (e.g., NASFAA) should consider the findings of this study in future messaging. Moreover, with the reauthorization of the Higher Education Act overdue, a better understanding of the 90/10 rule is imperative.

These findings have implications for nonprofit and for-profit student aid administrators. Those working in both sectors should consider these findings in relation to their own policies and work. It is imperative that those in the for-profit sector acknowledge the potential for unintended consequences and work to avoid them. Nonprofit administrators should take a similar approach. Although the 90/10 rule explicitly applies only to the for-profit sector, understanding the impacts can allow nonprofit administrators to think critically about potential unintended consequences of national, state, and internal policies that govern and regulate the financial aid process. Moreover, given that many in the for-profit industry want the 90/10 rule applied to all institutions – if the rule must exist at all – it is worth nonprofit administrators considering how their schools would be impacted.

Ensuring students receive a valuable education and taxpayers are not left footing the bill for low-quality FPCU degrees is important and the Department of Education should continue to safeguard students from predatory colleges. However, recognizing that policies may produce adverse behavior among institutions is important for effective market regulation. While there is some evidence of minor unintended consequences, the predominant impact of violating the rule is institutional closure.

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