

# Examining the Prevalence and Implications of Heightened Cash Monitoring in Higher Education

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Feedback and comments appreciated!

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**Abstract:** The U.S. Department of Education uses heightened cash monitoring (HCM), in which restrictions are placed on colleges' ability to access federal financial aid dollars, as a key form of accountability. Yet there is little research on the prevalence of HCM status in American higher education, and there have been no empirical analyses examining whether HCM induces colleges to close or change their behaviors. In this paper, we document the frequency of HCM status over time and focus empirically on the actions taken by colleges under the most restrictive HCM status. Results from three different estimation strategies show no consistent relationship between HCM2 and outcomes such as closures, student debt, graduation rates, and institutional spending.

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American higher education is arguably facing its most serious set of financial challenges that it has seen in decades. The share of Americans with considerable confidence in higher education as a whole fell from 57% in 2015 to 36% in 2023, showing a great deal of skepticism about the value of higher education in spite of strong economic returns for most graduates (Brenan, 2023; Webber, 2021). Combined with labor market options available in a reasonably strong economy, more recent high school graduates and older Americans are choosing to work instead of go to college (National Center for Education Statistics, 2023; authors' calculations using Integrated Postsecondary Education Data System data). The number of high school graduates is also declining in portions of the country (Bransberger et al., 2020), further pressuring enrollment.

This has contributed to a decline in college enrollment throughout most of the 2010s and early 2020s, particularly among for-profit colleges, community colleges, and regionally-focused four-year institutions (National Student Clearinghouse, 2023). Combined with financial pressures that colleges faced during the pandemic and rising operating costs (Commonfund Institute, 2023; Kelchen et al., 2021), institutional budgets have faced substantial challenges. The result has been an increase in the number of college closures over the last decade (authors' calculations using Postsecondary Education Participants System data). College closures have lasting negative effects on students, who are far less likely to earn credentials if their institution closes (Burns et al., 2023).

The federal government provides approximately \$120 billion to colleges each year in financial aid to students, and in exchange for that funding places requirements on how colleges operate in an effort to protect students and taxpayers (Kelchen, 2018b). One of the most influential federal accountability provisions is heightened cash monitoring (HCM), which allows

the U.S. Department of Education to delay disbursement of federal financial aid to colleges that are deemed to be risks from a financial, accreditation, or governance perspective. There are two levels of HCM. Under the less severe HCM1, the federal government reimburses colleges for financial aid awards after the funds are disbursed to students instead of the regular policy of receiving funds in advance of anticipated disbursements. Under HCM2, colleges are subject to additional scrutiny regarding each student's financial aid award (Federal Student Aid, 2022). While both levels of HCM represent concerns with institutional operations, the restrictions resulting from HCM2 are particularly burdensome for colleges to manage and thus reflect a risk to their ongoing viability.

By limiting colleges' ability to access federal financial aid dollars, the Department of Education has the power to potentially shape how colleges operate. While financial restrictions placed on colleges due to HCM have been blamed for the closure of institutions (Blumenstyk, 2014), there is no research empirically examining the relationship between HCM status and college closures. Additionally, there is no research that explores whether colleges placed on HCM changed their financial priorities or saw differences in student outcomes. In this study, we provide the first empirical evidence on these important topics, in part by leveraging the first public release of HCM data that highlighted colleges facing additional federal scrutiny.

Our research questions are the following:

- (1) To what extent is being placed on HCM2 associated with institutional closures?
- (2) To what extent did colleges change their financial priorities after being placed on HCM2?

(3) To what extent do student outcomes (debt burdens and completion rates) change after their colleges are placed on HCM2?

### **Conceptual Framework and Literature Review**

The federal government requires colleges to satisfy a number of accountability provisions in order to access federal financial aid (Kelchen, 2018b). These provisions can be divided into two categories: high-stakes policies (including HCM) that are tied to maintaining eligibility for federal financial aid and low-stakes mechanisms that are designed to provide information to students and the general public. In this section, we discuss how these accountability mechanisms are designed, how they could conceptually affect institutional actions in different ways, and how they have influenced student and institutional outcomes.

The conceptual framework for high-stakes accountability policy is driven by principal-agent theory (Jensen & Meckling, 1976), in which the principal (here, the federal government) can influence the actions of agents (colleges) by providing or withholding resources. Many for-profit colleges are highly reliant on federal financial aid dollars to fund their operations, but many public and private nonprofit colleges also receive a substantial share of their total revenue from federal financial aid (Looney & Lee, 2019). As a result, institutions should be expected to respond to threats to a key source of revenue and thus may respond differently to the relatively higher stakes of being placed on HCM2.

There have historically been three main high-stakes accountability policies in addition to heightened cash monitoring that eligible colleges must satisfy. The first is the cohort default rate, which cuts off access to federal financial aid dollars if too large of a share of students defaults on their federal student loans within three years of entering repayment (Federal Student Aid, 2022).

Previous research on the effects of default rate sanctions found that for-profit institutions were disproportionately affected and that it induced students to instead attend community colleges (Cellini et al., 2020; Hillman, 2015). Yet institutions did not respond to the possibility of sanctions by trying to reduce student charges or overall debt burdens, efforts that could reduce default rates (Kelchen, 2019a). However, the cohort default rate currently has little meaning as an accountability metric as income-driven repayment plans became more prevalent and colleges have engaged in practices to encourage students to go into forbearance instead of default (Itzkowitz, 2017; Kelchen, 2018b).

The second high-stakes policy is the financial responsibility score, which requires private nonprofit and for-profit colleges to satisfy metrics of financial health in order to receive federal funding. Colleges are evaluated based on a primary reserve ratio, an equity ratio, and a net income ratio and are assigned a score from -1 to 3. Colleges scoring below 1.0 fail the test and are automatically placed on HCM1, while colleges scoring between 1.0 and 1.4 are placed in an oversight zone that puts them on HCM1 unless they post a letter of credit with the Department of Education (Federal Student Aid, 2022). While there are examples of colleges manipulating their financial responsibility score by strategically issuing or repaying debt (Office of Postsecondary Education, 2022), there is no evidence that colleges substantially changed their revenue or expenditure patterns following a poor financial responsibility score (Kelchen, 2018a).

Finally, the 90/10 rule limits for-profit colleges to receiving 90 percent of their total revenue from federal financial aid. Historically, veterans' benefits and other federal funding outside of financial aid have been excluded from the federal funds portion of the calculation, but that changed in 2023 (Schwartz, 2022). The 90/10 rule has long been blamed for rising tuition at for-profit colleges as they seek funds from non-federal sources (Gillen, 2012). However,

research has not provided empirical support for that hypothesis even though colleges that violate the 90/10 rule are highly likely to close (Ward, 2019).

Several other lower-stakes accountability policies provide information to the public about institutional practices and outcomes. Instead of federal financial aid being at risk, the main effect for colleges would be reputational in nature. Research has generally found modest effects of informational interventions on student decisions (e.g., Steffel et al., 2020). The same result held when the federal government released new data on students' post-college outcomes through the College Scorecard in 2015. The overall response by students was modest and driven entirely by more-advantaged students considering colleges with better outcomes (Hurwitz & Smith, 2018). This corresponds with evidence on the effects of university scandals (primarily in athletics) on student enrollment decisions, which found modest but meaningful effects at more prestigious institutions (e.g., Cormier et al., 2022; Johnson & McCannon, 2022; Rooney & Smith, 2019). However, colleges on HCM tend to be much smaller and less nationally known, meaning that any effects of negative publicity at these institutions may be smaller.

Research on institutional responses to lower-stakes accountability policies is limited and with mixed findings. The Department of Education's College Affordability and Transparency Center is designed to highlight colleges with high tuition prices to shame them into lowering charges, but Baker (2020) showed null effects of being featured on the list. On the other hand, Kelchen and Liu (2022) examined the 2017 release of program-level outcomes on gainful employment metrics. These results were viewed more as informational than high-stakes due to the incoming Trump administration's promise to not tie federal aid to gainful employment. Yet programs that received passing scores were much less likely to close than programs that did not pass, suggesting the potential power of information in shaping institutional operations.

Federal accountability policies disproportionately affect colleges that are on the brink of closure, so we next discuss research on factors associated with college closures at private nonprofit and for-profit colleges. Nonprofit colleges with broader-access admissions policies, lower enrollment, and fewer financial resources are more likely to close, as they are more sensitive to relatively modest financial shocks (Bates & Santerre, 2000; Britton et al., 2022). There is some evidence that higher cohort default rates, lower financial responsibility scores, and being on HCM2 is associated with a higher likelihood of closures among both for-profit and nonprofit colleges, but those relationships largely disappear when controlling for a larger set of institutional financial characteristics (Kelchen, 2020).

### **Sample, Data, and Methods**

To answer our research questions, we examined the relationship between HCM2 status and several student and institutional outcomes using data from between the 2008-09 and 2020-21 academic years. The following section details our sample, data, and three analytic methods used in this study.

#### **Sample**

Our initial sample consisted of 7,540 private nonprofit and for-profit colleges and universities in the 50 states that were ever open and received federal financial aid at some point between 2006 and 2023. We excluded public colleges because they were rarely on HCM2 (only 15 during the panel) and because they are exempt from the federal government's financial responsibility score requirements. For regression analyses, we further limited the sample as detailed below.

## Data

Data on whether colleges were on Heightened Cash Monitoring came from two sources. The first source was through lists that have been posted to Federal Student Aid (FSA)'s website quarterly since March 2015; the Department of Education first posted data following an investigation by *Inside Higher Ed* (Stratford, 2015) Prior to 2015, no data were publicly available on HCM status. These lists contained details about the level of HCM (HCM1 or HCM2) and the reason why the institution was placed on HCM. For the purposes of our analyses, we collapsed quarterly observations to annual observations to match our other data sources.

The second HCM data source was the College Scorecard, which was first released in its current form in September 2015. The initial release of the dataset contained annual observations of HCM2 status from calendar years 1999 through 2015. HCM2 status in the College Scorecard has been updated annually since 2015, with the exception of 2022. When HCM2 data were available from both sources, we used FSA data because those data were more detailed and because the College Scorecard listed the source of HCM data as being from FSA. HCM2 status in the two data sources nearly perfectly aligned in every year but one (2016) between 2015 and 2023, with just two colleges listed as being on HCM2 in the College Scorecard and not in FSA data.<sup>2</sup>

Table 1 shows the reasons why colleges were first placed on HCM1 and HCM2 between 2015 and 2023 using FSA data. Fully 80% of the colleges placed on HCM1 were there due to their financial responsibility score, with no other reason causing more than ten percent of cases.

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<sup>2</sup> The 2016 College Scorecard dataset shows an additional 50 colleges on HCM2 that are not in FSA data for that year, and that apparently captured some colleges on HCM2 in 2015 instead of 2016.



The most common reason for HCM2 status was accreditation concerns (37%), followed by financial responsibility (34%), administrative capacity (28%), and late paperwork (21%). This indicates some level of overlap in the rationales for HCM placement, but HCM2 represents a much more serious set of issues than HCM1 and that is why the Department of Education places additional scrutiny on the record of every student receiving federal financial aid.

[Insert Table 1 here]

Figure 1 shows trends in HCM1 and HCM2 status based on available data (HCM1 from 2015 through 2023 and HCM2 from 1999 through 2023). The number of colleges on HCM2 slowly increased from 37 in 1999 to 64 in 2014 before jumping to 128 in 2015 and a peak of 238 in 2016. By 2020, only 81 colleges were on HCM2 and 62 colleges were on HCM2 in 2023. HCM1 status was most common during the first year of available data, with 1,337 colleges on HCM1 in 2015. The number then steadily declined to a low of 654 institutions in 2023. These data show that while HCM was at its most prominent as an accountability tool in the mid-2010s, it still affects a sizable number of institutions today.

[Insert Figure 1 here]

We considered colleges that were on HCM2 as our treatment group, as this is the most severe level of scrutiny that the federal government regularly places on colleges. Our comparison group in this analysis was colleges that were not on HCM2 but had a failing financial responsibility score, with data on financial responsibility scores also coming from FSA. Although financial responsibility scores have been calculated since at least 1996, they first released scores in the 2006-07 academic year due to data quality concerns in earlier years (Kelchen, 2018a). A failing financial responsibility score automatically places colleges on at least HCM1, so this is a group of institutions that were known to be on HCM even before FSA

made the list of affected colleges public in 2015. As such, we are comparing colleges under the highest level of scrutiny by the Department of Education to colleges with a lower, but nonzero, level of scrutiny.

We had four primary outcomes of interest. The first was whether the college closed by the end of a given year, with data on college closures coming from FSA's Postsecondary Education Participants System (PEPS). We considered a college to be closed only if the main campus (Office of Postsecondary Education ID (OPEID) ending in 00) was closed, as thriving and struggling colleges alike frequently close branch campuses in sites such as high schools and community centers. Given that HCM2 status has been blamed for college closures (Blumenstyk, 2014) and the adverse effects that college closures can have on students (Burns et al., 2023), this is perhaps the most important outcome of our study.

The next outcome was median student debt burdens, using data from the College Scorecard. We considered overall debt for all students receiving federal financial aid, as well as breaking down debt for completers and noncompleters. We then considered graduation rates within 150% of normal time for first-time, full-time students using Integrated Postsecondary Education Data System (IPEDS) data, with separate metrics for students in certificate versus degree programs because certificate programs often have higher completion rates due to their shorter duration. Finally, we examined institutional expenses to see if colleges facing HCM2 tried to cut back their spending in an effort to improve their finances; this measure came from IPEDS.

We also collected data on other institutional and state-level characteristics that could affect the likelihood of being on HCM2 or other student outcomes. Institutional characteristics included whether the college was for-profit, FTE enrollment, the share of undergraduate

students, the racial/gender breakdown of students, the percent receiving Pell Grants and student loans, total revenue, tuition as a share of total revenue, and whether the college had a failing cohort default rate. All of the measures except for the cohort default rate (Federal Student Aid) came from IPEDS. As state-level economic metrics, we used the unemployment rate (Bureau of Labor Statistics) and poverty rate (Census Bureau).

Table 2 contains summary statistics for our sample between the 2008-09 and 2020-21 academic years, broken down by whether a college was ever on HCM2 (n=711), failed financial responsibility but was never on HCM2 (n=1,780), or was never on HCM2 and never failed financial responsibility (n=5,049). Fully sixty percent of the colleges that had ever been on HCM2 closed by late 2023, compared to 23% of colleges that failed the financial responsibility test and only 14% of those that did not fail. Colleges that were on HCM or financial responsibility were disproportionately for-profit institutions, smaller, more tuition reliant, and more racially diverse than colleges that were not subject to either accountability metric. Institutions that were ever on HCM2 were broadly similar to institutions that failed the financial responsibility test without being on HCM2, but served larger shares of Black and Hispanic students.

[Insert Table 2 here]

## **Methods**

We used three different analytic techniques to examine the relationship between HCM2 status and student and institutional outcomes. The first technique was to use panel regressions with two-way (institution and year) fixed effects, with the 711 colleges under HCM2 as the treatment group and the 1,780 colleges that failed financial responsibility (a proxy for HCM1) as the comparison group. As an alternative, we considered an additional 744 institutions that ever

had a financial responsibility score in the oversight zone status. Most of these colleges were also placed on HCM1, although their sanctions were less than colleges that failed outright.

The second technique was to conduct a difference-in-differences research design that compared the outcomes of colleges on HCM2 before and after 2015 (when data were first made available to the public on HCM2 status) relative to the same comparison group of colleges that had a failing financial responsibility score. The release of the HCM2 list was not known in advance to colleges or the public, so the results of an interaction term between HCM2 and post-2015 observations should represent something close to any causal effect that the 2015 release of HCM data had on how colleges and students acted.

We checked the extent to which HCM was discussed before and after 2015 by conducting Google and Google News searches to examine the level of media discussion and public scrutiny regarding HCM. We found very few mentions of the term prior to 2015 outside of official communication from Federal Student Aid, with the only notable exception being an *Inside Higher Ed* article on Corinthian Colleges in 2014 (Fain, 2014). After 2015, we found approximately 100 news articles on HCM. These articles were in a mix of local and national news outlets and described officials in the college making efforts to get off HCM due to the potential for adverse publicity. As a result, it does appear that HCM has received more scrutiny since 2015, making differential effects over time plausible.

For both of these models, we logged the debt and expenditure outcomes, controlled for the covariates discussed in the previous section (logging FTE enrollment and total revenue), and adjusted all financial variables into 2022 dollars using the Consumer Price Index. We also clustered standard errors at the OPEID level to account for how Federal Student Aid reported data by combining some systems into one observation; this is more common among for-profit

institutions than private nonprofit colleges (Kelchen, 2019b). To examine the possibility of pre-treatment trends driving results, we ran these models examining the relationships between HCM2 and student outcomes for each year between five years before HCM2 status to five years after HCM2 status.

Our final set of models was a set of event study analyses using the *eventstudyinteract* technique in Stata created by Sun and Abraham (2020). Event studies are typically preferred for evaluating policies that are implemented at different time periods, creating a different number of pre-treatment observations and resulting in treatment effects that may vary over time (de Chaisemartin & D'Haultfoeuille, 2023; Goodman-Bacon, 2021). The Sun and Abraham (2020) technique uses weighted average treatment effects to account for pre-treatment observations, and we used the year prior to being placed on HCM2 status as the reference year in our analyses. We excluded closure as an outcome because no colleges closed prior to being placed on HCM2. A distinction in the sample between the regression-based and event study models is that the event study models defined the comparison group as institutions that were ever failed the financial responsibility test while never being on HCM2 instead of institutions that failed in that particular year.

### **Limitations**

There are two important limitations to our analyses, even after using multiple data sources and analytic strategies. The first limitation is that inclusion in both our treatment group (HCM2) and comparison group (a failing financial responsibility score) is based on lagging indicators of institutional performance. For example, financial responsibility scores for the 2020-21 award year were based on institutional fiscal years ending between July 1, 2020 and June 30, 2021 and were released to the public in the early spring of 2023. While HCM status is updated

more frequently, many of the reasons for HCM2 placement are based on concerns with financial statements or longstanding investigations by accreditors or the federal government. As a result, institutions' poorest performance may be a year or two in advance of receiving additional scrutiny.

Second, our comparison group does not capture the full list of institutions that would have had a failing financial responsibility score. Federal Student Aid can place institutions on HCM for financial responsibility reasons without calculating a score. These include a lack of sufficient cash reserves, not being current on other debt payments, and having concerns noted on audited financial statements (Federal Student Aid, 2022). These institutions do not show up in our comparison group because they do not have a numeric score and more detailed data on HCM placement reasons are only available for a portion of our sample.

## **Results**

We began by conducting two-way fixed effects regressions examining the relationship between HCM2 status and the outcomes of interest. The results shown in Table 3 for periods between five years before and five years after being placed on HCM2, with the comparison group being colleges that had failed the financial responsibility test but were not on HCM2. There is no relationship between HCM2 status and closures at any period following being placed on HCM2. There is some evidence that student loan debt—particularly for completers—was lower at colleges on HCM2 than similar colleges that had a failing financial responsibility score, and that it began shortly before being placed on HCM2. Because of the lag between when colleges become aware of some of their financial concerns and when they are placed on HCM2, it is

possible that these relationships could be driven by the likelihood of being placed on HCM2 soon.

[Insert Table 3 here]

There was no relationship between HCM2 status and the graduation rates of students who were enrolled in certificate programs. There was a negative relationship between HCM2 and graduation rates of degree-seeking students, but this existed several years prior to colleges being placed on HCM2. The same negative pre-treatment relationship existed for total expenses as early as five years prior to being on HCM2 even after controlling for a range of institutional and state-level characteristics. This suggests that colleges that eventually landed on HCM2 may have differed from other financially-struggling institutions in important ways. These broad trends held when expanding the comparison group to include colleges that had a zone financial responsibility score as well as a failing score (Appendix 1).

We then used a difference-in-differences framework to examine whether the relationship between HCM2 status and our outcomes of interest differed following the 2015 release of information on colleges' HCM2 status. As shown in Table 4, there is no clear evidence that releasing data in 2015 resulted in meaningful changes to institutional outcomes as measured by the interaction term between HCM2 and a post-2015 indicator variable. There were some scattered positive coefficients on debt, graduation rates, and expenses in the years prior to HCM2 status, but they were inconsistent and quickly disappeared in post-treatment periods. Again, the trends held when including colleges that had a zone financial responsibility score in the comparison group (Appendix 2).

[Insert Table 4 here]

Finally, we used event study models to estimate the effects of HCM2 on student and institutional outcomes (excluding closures), with the results shown in Figures 2-4. The results for student debt measures (Figure 2) differed somewhat from the TWFE results. We saw a switch from negative and significant estimates five years prior to HCM2 to positive and significant estimates two years prior to HCM2, while pre-treatment estimates in the TWFE model were consistently negative and frequently significant. We then found negative and significant effects on debt approximately 3-4 years after being placed on HCM2, and this held across completers and noncompleters.

Figure 3 shows the effect of HCM2 on graduation rates for degree and certificate programs. There was no consistent post-treatment effect on graduation rates for either type of credential. Finally, there were no clear effects of HCM2 on institutional expenditure patterns (Figure 4), although the post-treatment coefficients are imprecisely estimated. The same pattern of findings again held when including colleges that ever had a zone financial responsibility score in the comparison group (see Appendices 3-5).

[Insert Figures 2-4 here]

## **Discussion**

The federal government has a number of tools that it can use to hold colleges accountable for their actions, and heightened cash monitoring is one of the most powerful tools because it can restrict the flow of federal financial aid dollars to colleges. Yet, in part because HCM actions were not announced to the public before 2015, little is known about the prevalence of HCM over time or the extent to which being placed on HCM affects institutional behaviors. We focused our empirical analyses on HCM2 status because it is a stronger accountability policy and it allowed



us to identify a reasonable comparison group of colleges that were on HCM1 for having a failing financial responsibility score.

Our descriptive examination of the number of colleges on HCM showed a sharp increase in the number of colleges subject to HCM2 right as HCM data were being released to the public for the first time in 2015. The Obama administration only released the data following media attention given to what was a secret list (Stratford, 2015), so it does not appear that the federal government was seeking to draw attention to this increase. But given increasing financial challenges in much of American higher education, it is surprising that fewer colleges have been on HCM2 since the beginning of the coronavirus pandemic even with federal pandemic support funds serving as a key financial buffer for colleges. This is an area in which qualitative research exploring the federal government's process for placing colleges on HCM2 would be incredibly valuable.

Our results varied somewhat across the three different empirical specifications, but we prefer the difference-in-differences and event study models over standard two-way fixed effects models. The difference-in-differences models did not show a meaningful change in student debt, graduation rate, and institutional expenses measures following the public release of HCM2 data in 2015. There was also no relationship with college closures. However, the event study results found some decreases in student debt burdens after taking pre-treatment trends into account. Put together, these findings suggest that HCM2 status may have modestly influenced institutional actions, but this was not driven by the public release of information about HCM2.

There are other important outcomes that could potentially be influenced by the Department of Education placing institutions on HCM2 status besides the ones examined in this paper. Student enrollment patterns, particularly by race, gender, and family income, are of

particular interest as there are concerns about students from historically underrepresented groups disproportionately attending institutions that the federal government has identified as a serious concern. Prior research has found that institutions placed on sanctions in the 1990s for high cohort default rates saw declines in enrollment, although there were no substantial differences across types of students (Darolia, 2013). It is unclear whether the same relationship would hold more recently or for HCM2. Focusing on tuition charges, institutional staffing, and leadership changes would also be useful metrics to examine.

Finally, the same rationale motivating this research could be applied to other accountability provisions such as gainful employment, financial responsibility scores, letters of credit through the Department of Education, and accreditation actions. Each of these provisions is designed in some way to encourage colleges to change their actions, yet there is little research on these topics. Additionally, the potential student response to these provisions is worth studying to see whether certain types of students are positively or negatively affected.

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**Table 1: Reasons colleges were first placed on HCM, 2015-2023.**

Reason	HCM1 (pct)	HCM2 (pct)
Financial responsibility	80.1	33.7
Late paperwork	7.3	20.7
Accreditation concerns	0.3	36.8
Severe review issues	0.2	9.5
Administrative capacity	4	28.1
Other	8.4	14
Number of colleges	1,615	570

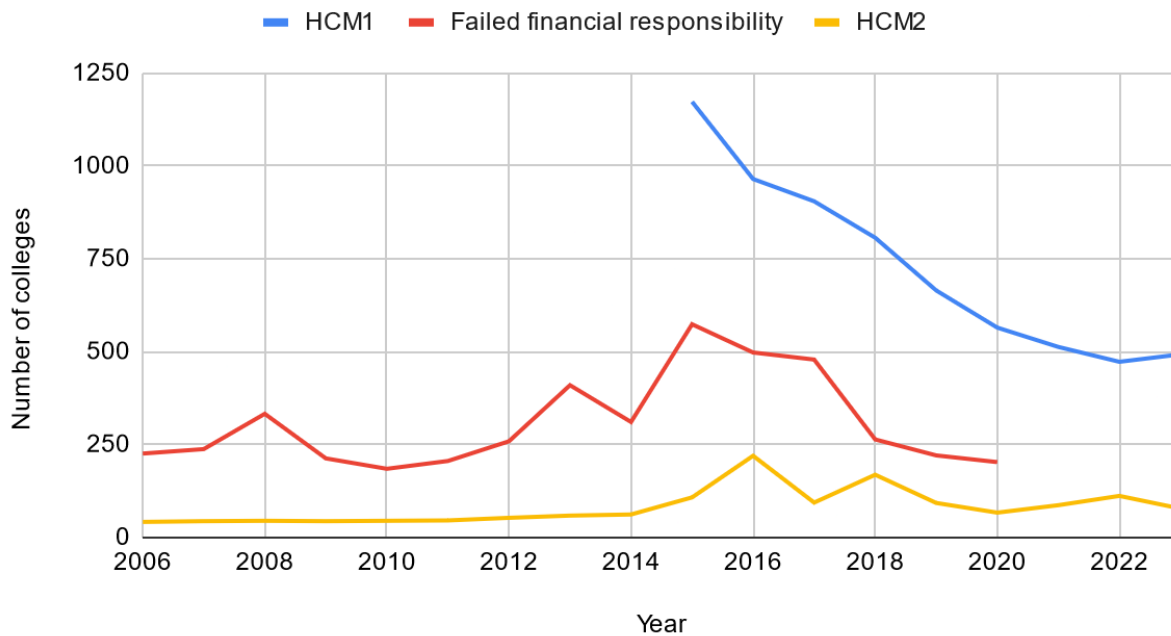
Source: Federal Student Aid data.

Notes:

(1) Data are at the IPEDS UnitID level.

(2) This captures the initial reason why colleges were placed on HCM, which may have changed over time.

**Figure 1: HCM1 and HCM2 status over time**



Sources: Federal Student Aid, College Scorecard.

Note: Colleges that were on HCM2 but failed financial responsibility are only listed under failing HCM2.

**Table 2: Summary statistics of the dataset, 2008-09 to 2020-21.**

Characteristic	Ever on HCM2		Failed financial responsibility, never on HCM2		Never on HCM2 or financial responsibility	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
<u>Outcomes</u>						
Closed by 2023 (pct)	60.2	(49.0)	23.2	(42.2)	13.5	(34.1)
<u>Debt (\$)</u>						
All students	11,335	(4,277)	11,952	(4,827)	13,966	(6,517)
Completers	20,100	(10,012)	18,053	(8,989)	20,112	(9,959)
Non-completers	7,135	(2,767)	6,940	(2,659)	7,824	(3,412)
Grad rate (certificates, pct)	66.9	(20.0)	68.8	(18.5)	68.9	(18.5)
Grad rate (degrees, pct)	55.6	(35.6)	65.4	(36.4)	65.0	(31.0)
Total expenses (\$mil)	10.03	(20.28)	13.64	(39.09)	79.06	(445.87)
<u>Institutional characteristics</u>						
For-profit (pct)	86.8	(33.8)	72.4	(44.7)	53.2	(49.9)
FTE enrollment	568	(1,544)	604	(2,661)	1,403	(4,412)
Pct undergraduate	94.3	(18.6)	90.3	(26.5)	86.9	(26.6)
Black students (pct)	28.8	(27.6)	23.5	(24.6)	19.9	(23.6)
Hispanic students (pct)	20.0	(24.0)	14.7	(19.7)	16.0	(20.5)
Asian students (pct)	4.2	(10.6)	3.5	(9.1)	4.0	(8.3)
Female students (pct)	66.1	(27.8)	72.9	(25.1)	66.7	(27.0)
Percent Pell	62.5	(20.6)	57.3	(21.4)	49.5	(23.0)
Percent with student loans	62.9	(25.6)	62.1	(24.6)	57.6	(24.9)
Failed cohort default rate (pct)	3.7	(18.8)	1.9	(13.5)	1.5	(12.0)
Total revenue (\$mil)	11.21	(19.72)	14.50	(44.54)	92.03	(571.47)
Tuition as share of revenue (pct)	78.8	(25.6)	75.5	(25.3)	69.4	(26.7)
State unemployment rate (pct)	6.8	(2.3)	6.6	(2.3)	6.5	(2.3)
State poverty rate (pct)	13.8	(3.0)	13.2	(3.0)	13.1	(3.0)
Number of colleges	711		1,780		5,049	

Sources: College Scorecard (debt, earnings, HCM), Postsecondary Education Participants System (closures), Federal Student Aid (financial responsibility, default rate, HCM), Bureau of Labor Statistics (unemployment rate), Census Bureau (poverty rate), Integrated Postsecondary Education Data System (all others)

Notes:

- (1) Colleges are defined at the IPEDS UnitID level, not the Federal Student Aid OPEID level.
- (2) All financial values are adjusted into 2022 dollars using the Consumer Price Index.

**Table 3: Two-way fixed effects regression results examining the relationship between HCM2 status and student and institutional outcomes.**

Outcome	Time period										
	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Closed (pct)	--	--	--	--	--	--	-0.005	0.001	-0.028	-0.028	0.021
	--	--	--	--	--	--	(0.006)	(0.017)	(0.024)	(0.025)	(0.014)
Debt (\$, log)											
All students	-0.073	-0.046	-0.051	-0.103*	-0.124*	-0.113*	-0.112*	-0.161**	-0.072	-0.006	-0.001
	(0.045)	(0.049)	(0.050)	(0.046)	(0.048)	(0.049)	(0.048)	(0.055)	(0.061)	(0.052)	(0.049)
Completers	-0.015	-0.001	0.012	-0.062	-0.090	-0.136	-0.162*	-0.218**	0.009	-0.030	-0.038
	(0.067)	(0.073)	(0.076)	(0.071)	(0.062)	(0.072)	(0.073)	(0.078)	(0.134)	(0.075)	(0.065)
Non-completers	-0.014	0.004	0.008	-0.006	-0.017	-0.021	-0.055	-0.103	-0.070	0.031	0.026
	(0.049)	(0.048)	(0.043)	(0.047)	(0.050)	(0.052)	(0.053)	(0.063)	(0.054)	(0.047)	(0.038)
Graduation rates											
Certificates (pct)	0.027	-0.015	-0.027	-0.022	0.004	-0.025	-0.031	0.031	0.039	0.004	-0.003
	(0.029)	(0.028)	(0.027)	(0.027)	(0.029)	(0.028)	(0.026)	(0.026)	(0.033)	(0.034)	(0.034)
Degrees (pct)	-0.030	-0.145**	-0.190***	-0.196***	-0.117*	-0.116**	-0.109**	-0.046	0.003	-0.076	-0.024
	(0.050)	(0.046)	(0.047)	(0.047)	(0.047)	(0.037)	(0.042)	(0.038)	(0.051)	(0.047)	(0.052)
Total expenses (\$, log)	-0.472***	-0.318***	-0.262**	-0.294***	-0.220***	-0.220***	-0.112	-0.279**	-0.274	-0.027	-0.026
	(0.124)	(0.119)	(0.079)	(0.072)	(0.058)	(0.058)	(0.059)	(0.086)	(0.192)	(0.140)	(0.167)
Max sample size	1,904	1,827	2,068	2,449	2,465	2,477	2,477	2,477	2,477	2,477	2,477

Notes:

- (1) All regressions control for the institutional characteristics listed in Table 2 and include year fixed effects and OPEID-clustered standard errors.
- (2) The comparison group consists of institutions that had a failing financial responsibility score in the year that treatment institutions were on HCM2.
- (3) \* represents  $p < .05$ , \*\* represents  $p < .01$ , and \*\*\* represents  $p < .001$ .
- (4) Each coefficient is the result of a separate regression.



**Table 4: Difference-in-differences regression results examining the relationship between HCM2 status and student and institutional outcomes after 2015.**

Outcome	Time period										
	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Closed (pct)	--	--	--	--	--	--	-0.005	0.028	0.009	0.062	-0.004
	--	--	--	--	--	--	(0.005)	(0.026)	(0.044)	(0.055)	(0.028)
Debt (\$, log)											
All students	-0.048	0.063	0.053	0.104*	0.032	0.065	0.040	-0.020	0.036	0.028	0.049
	(0.059)	(0.052)	(0.061)	(0.052)	(0.052)	(0.053)	(0.055)	(0.061)	(0.071)	(0.061)	(0.069)
Completers	0.055	0.061	-0.065	0.015	0.036	-0.018	-0.040	-0.083	0.062	0.020	0.009
	(0.078)	(0.063)	(0.054)	(0.059)	(0.060)	(0.065)	(0.075)	(0.066)	(0.076)	(0.117)	(0.128)
Non-completers	0.071	0.143*	0.063	0.083	0.052	0.005	-0.029	-0.067	0.064	0.079	0.038
	(0.065)	(0.070)	(0.062)	(0.061)	(0.058)	(0.060)	(0.054)	(0.068)	(0.059)	(0.056)	(0.070)
Graduation rates											
Certificates (pct)	-0.025	-0.053	0.007	0.020	0.030	0.001	-0.016	0.026	0.026	-0.029	-0.031
	(0.045)	(0.045)	(0.048)	(0.039)	(0.040)	(0.040)	(0.044)	(0.035)	(0.039)	(0.053)	(0.038)
Degrees (pct)	0.119	0.127	0.124	0.086	0.160*	0.145*	0.066	-0.008	0.036	0.011	-0.035
	(0.078)	(0.085)	(0.088)	(0.074)	(0.073)	(0.059)	(0.067)	(0.052)	(0.084)	(0.091)	(0.062)
Total expenses (\$, log)	0.037	0.145	0.280*	0.225*	0.086	-0.022	0.067	0.065	0.126	0.337	0.167
	(0.175)	(0.132)	(0.133)	(0.108)	(0.083)	(0.071)	(0.064)	(0.085)	(0.147)	(0.221)	(0.255)
Max sample size	1,904	1,827	2,068	2,449	2,465	2,477	2,477	2,477	2,477	2,477	2,477

Notes:

(1) The coefficient of interest is the interaction term  $hcm2*post-2015$ . Coefficients for  $hcm2$  and  $post-2015$  are available upon request from the authors.

(2) All regressions control for the institutional characteristics listed in Table 2 and include year fixed effects and OPEID-clustered standard errors.

(3) The comparison group consists of institutions that had a failing financial responsibility score in the year that treatment institutions were on HCM2.

(4) \* represents  $p < .05$ , \*\* represents  $p < .01$ , and \*\*\* represents  $p < .001$ .

(5) Each coefficient is the result of a separate regression.

Figure 2: Effect of HCM2 on student debt

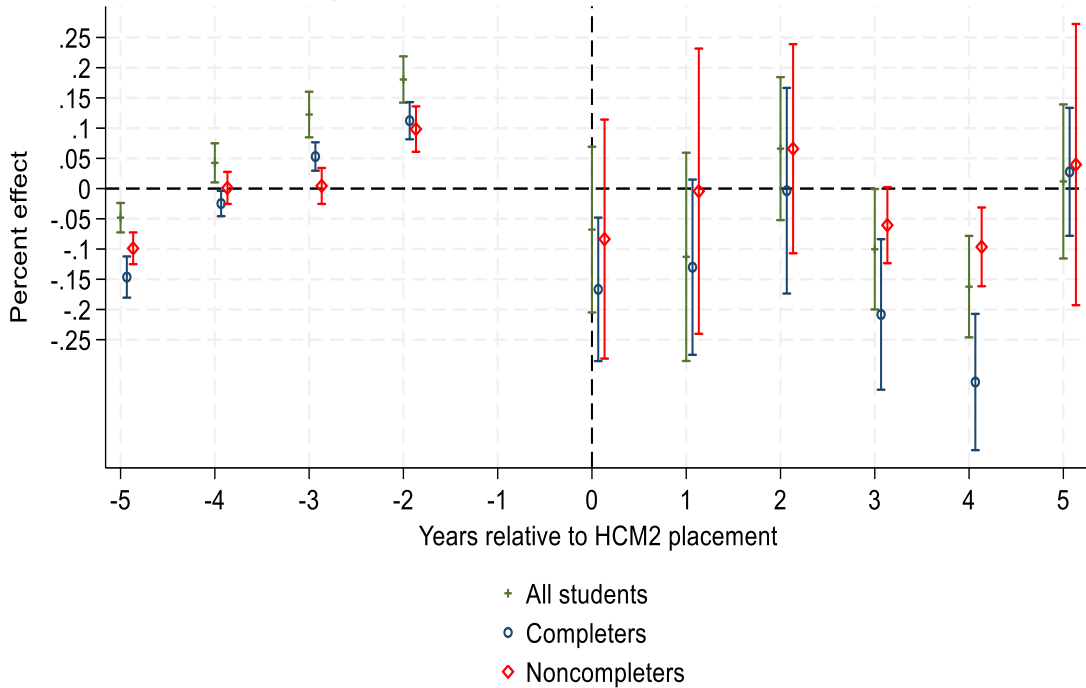


Figure 3: Effect of HCM2 on graduation rates

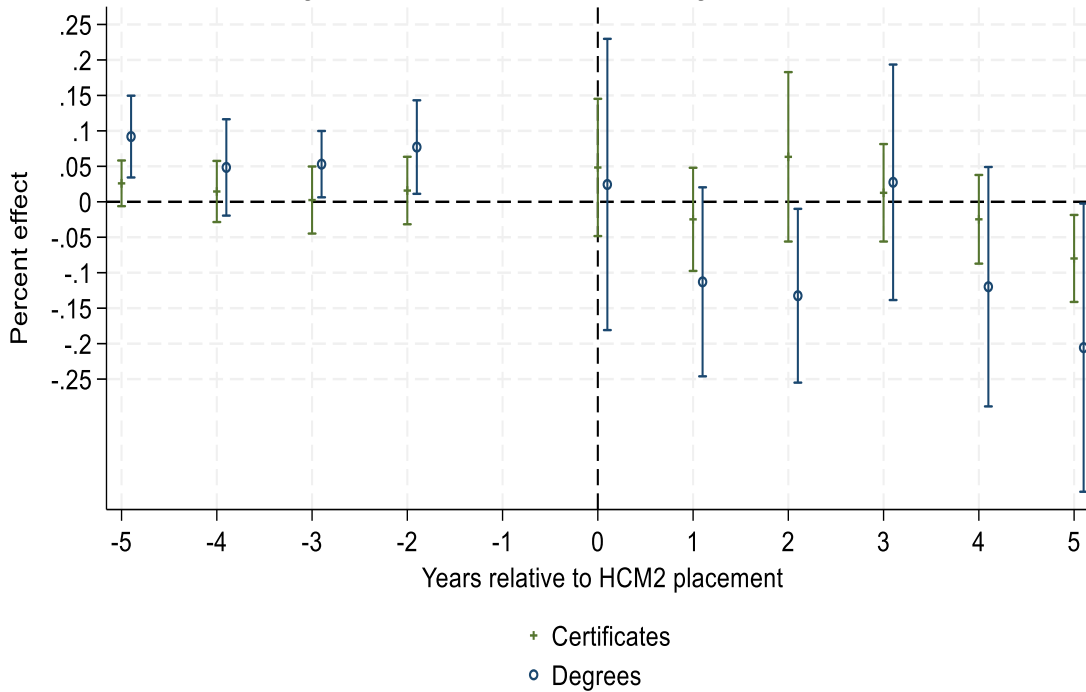
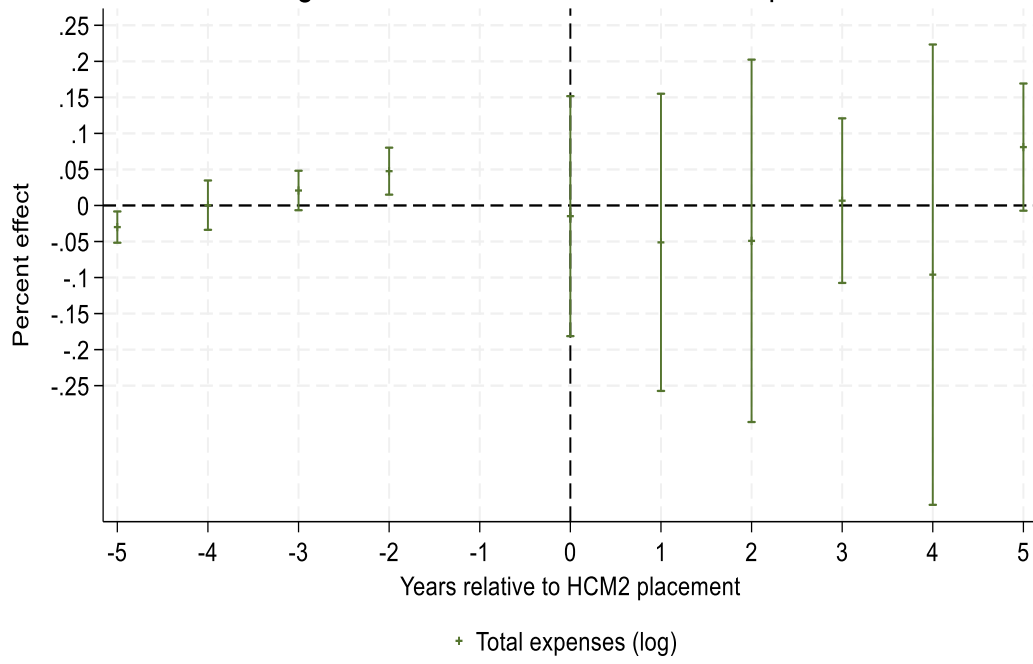


Figure 4: Effect of HCM2 on total expenses



**Appendix 1: Two-way fixed effects regression results examining the relationship between HCM2 status and student and institutional outcomes (alternate comparison group).**

Outcome	Time period										
	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Closed (pct)	--	--	--	--	--	--	-0.003	0.004	-0.020	-0.006	0.022
	--	--	--	--	--	--	(0.004)	(0.016)	(0.021)	(0.020)	(0.013)
Debt (\$, log)											
All students	-0.040	-0.032	-0.046	-0.089	-0.112*	-0.097*	-0.093*	-0.145**	-0.065	-0.010	0.013
	(0.044)	(0.047)	(0.049)	(0.046)	(0.047)	(0.049)	(0.046)	(0.054)	(0.060)	(0.052)	(0.051)
Completers	0.030	0.012	-0.004	-0.041	-0.094	-0.129*	-0.131*	-0.178*	0.013	-0.031	-0.023
	(0.058)	(0.065)	(0.070)	(0.066)	(0.058)	(0.065)	(0.061)	(0.076)	(0.134)	(0.078)	(0.070)
Non-completers	0.025	0.028	0.001	-0.006	-0.015	-0.019	-0.034	-0.087	-0.054	0.023	0.027
	(0.045)	(0.045)	(0.043)	(0.046)	(0.047)	(0.047)	(0.050)	(0.061)	(0.054)	(0.047)	(0.042)
Graduation rates											
Certificates (pct)	-0.016	-0.020	-0.024	-0.026	0.005	-0.007	-0.036	0.011	0.027	0.007	-0.009
	(0.028)	(0.027)	(0.028)	(0.028)	(0.028)	(0.026)	(0.025)	(0.026)	(0.032)	(0.030)	(0.030)
Degrees (pct)	-0.035	-0.134**	-0.213***	-0.190***	-0.120**	-0.123***	-0.104**	-0.039	0.012	-0.030	-0.013
	(0.047)	(0.045)	(0.046)	(0.046)	(0.046)	(0.034)	(0.039)	(0.034)	(0.052)	(0.057)	(0.057)
Total expenses (\$, log)	-0.320**	-0.198	-0.145*	-0.191**	-0.162**	-0.172**	-0.085	-0.214**	-0.175	0.041	0.077
	(0.102)	(0.106)	(0.072)	(0.066)	(0.053)	(0.054)	(0.053)	(0.079)	(0.170)	(0.134)	(0.161)
Max sample size	2,710	2,608	3,013	3,568	3,586	3,601	3,601	3,601	3,601	3,601	3,601

Notes:

- (1) All regressions control for the institutional characteristics listed in Table 2 and include year fixed effects and OPEID-clustered standard errors.
- (2) The comparison group consists of institutions that had a failing or zone financial responsibility score in the year that treatment institutions were on HCM2.
- (3) \* represents  $p < .05$ , \*\* represents  $p < .01$ , and \*\*\* represents  $p < .001$ .
- (4) Each coefficient is the result of a separate regression.

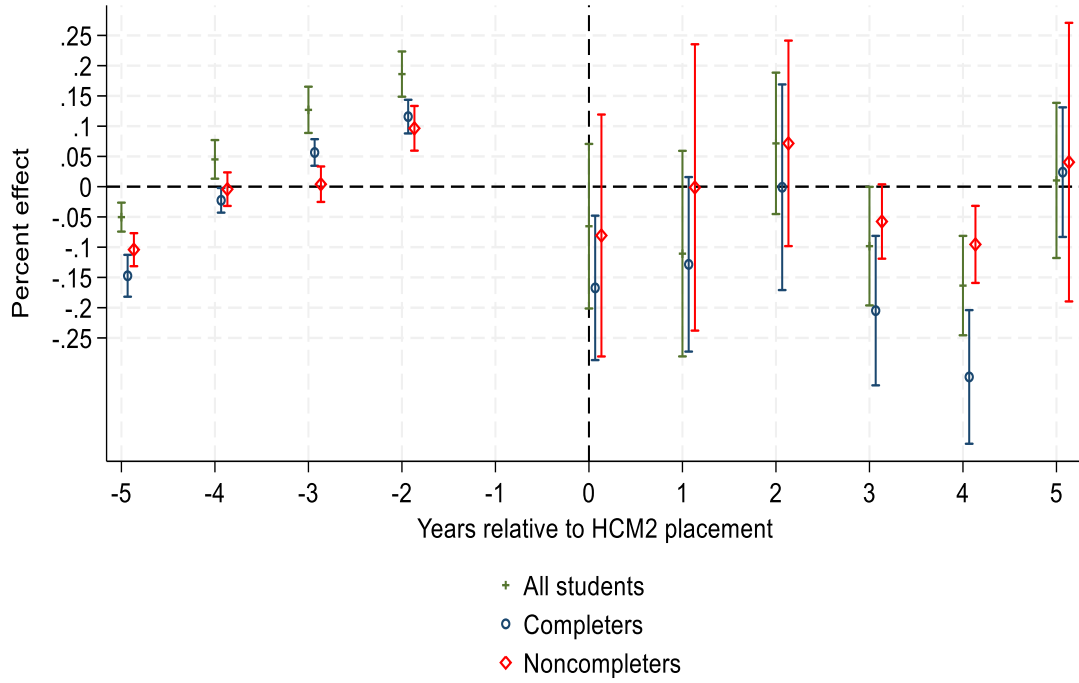
**Appendix 2: Difference-in-differences regression results examining the relationship between HCM2 status and student and institutional outcomes after 2015 (alternate comparison group).**

Outcome	Time period										
	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Closed (pct)	--	--	--	--	--	--	-0.004	0.027	-0.001	0.022	-0.010
	--	--	--	--	--	--	(0.004)	(0.026)	(0.036)	(0.046)	(0.025)
Debt (\$, log)											
All students	-0.047	0.046	0.048	0.101*	0.040	0.063	0.054	-0.001	0.034	0.019	0.049
	(0.058)	(0.051)	(0.058)	(0.051)	(0.051)	(0.053)	(0.055)	(0.059)	(0.069)	(0.061)	(0.069)
Completers	0.039	0.041	-0.054	0.039	0.046	-0.004	-0.012	-0.039	0.085	0.035	0.029
	(0.077)	(0.060)	(0.051)	(0.057)	(0.057)	(0.057)	(0.070)	(0.063)	(0.075)	(0.117)	(0.125)
Non-completers	0.078	0.120	0.063	0.088	0.053	0.012	-0.012	-0.020	0.078	0.094	0.059
	(0.063)	(0.067)	(0.059)	(0.053)	(0.055)	(0.057)	(0.050)	(0.065)	(0.054)	(0.054)	(0.070)
Graduation rates											
Certificates (pct)	-0.028	-0.054	-0.016	0.009	0.013	-0.014	-0.018	-0.001	0.014	-0.015	-0.052
	(0.044)	(0.043)	(0.048)	(0.037)	(0.039)	(0.035)	(0.039)	(0.033)	(0.036)	(0.050)	(0.036)
Degrees (pct)	0.087	0.137	0.161	0.098	0.181*	0.129*	0.053	-0.039	0.033	0.011	-0.030
	(0.075)	(0.079)	(0.084)	(0.072)	(0.072)	(0.060)	(0.064)	(0.050)	(0.085)	(0.096)	(0.066)
Total expenses (\$, log)	0.035	0.180	0.321*	0.247*	0.094	-0.004	0.059	0.052	0.112	0.298	0.141
	(0.163)	(0.125)	(0.133)	(0.104)	(0.077)	(0.067)	(0.061)	(0.081)	(0.146)	(0.219)	(0.253)
Max sample size	2,710	2,608	3,013	3,568	3,586	3,601	3,601	3,601	3,601	3,601	3,601

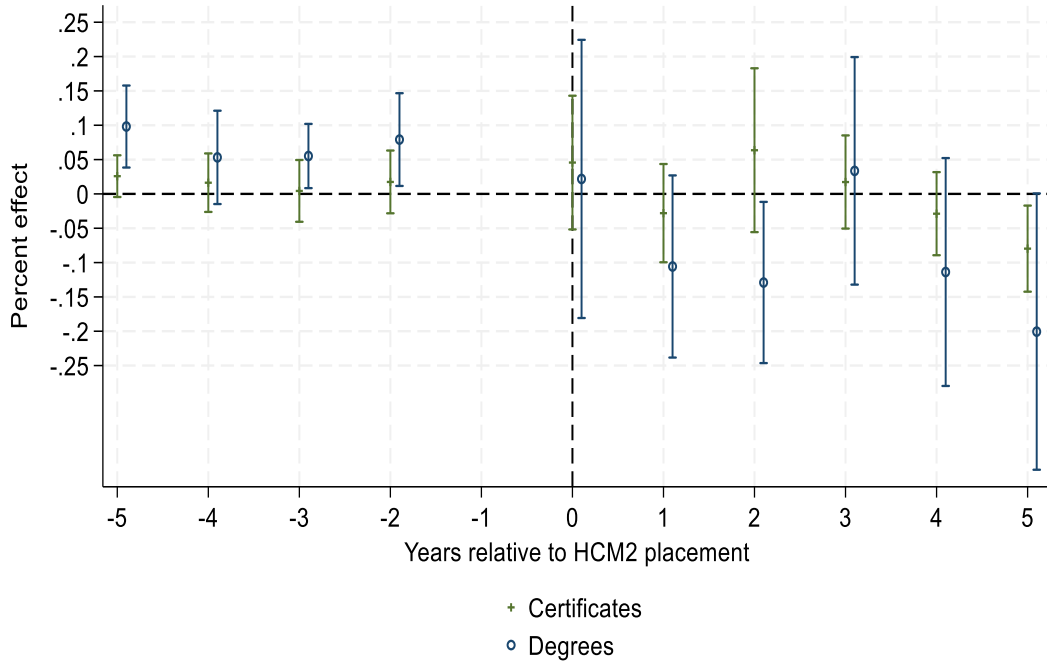
Notes:

- (1) The coefficient of interest is the interaction term hcm2\*post-2015. Coefficients for hcm2 and post-2015 are available upon request from the authors.
- (2) All regressions control for the institutional characteristics listed in Table 2 and include year fixed effects and OPEID-clustered standard errors.
- (3) The comparison group consists of institutions that had a failing or zone financial responsibility score in the year that treatment institutions were on HCM2.
- (4) \* represents p<.05, \*\* represents p<.01, and \*\*\* represents p<.001.
- (5) Each coefficient is the result of a separate regression.

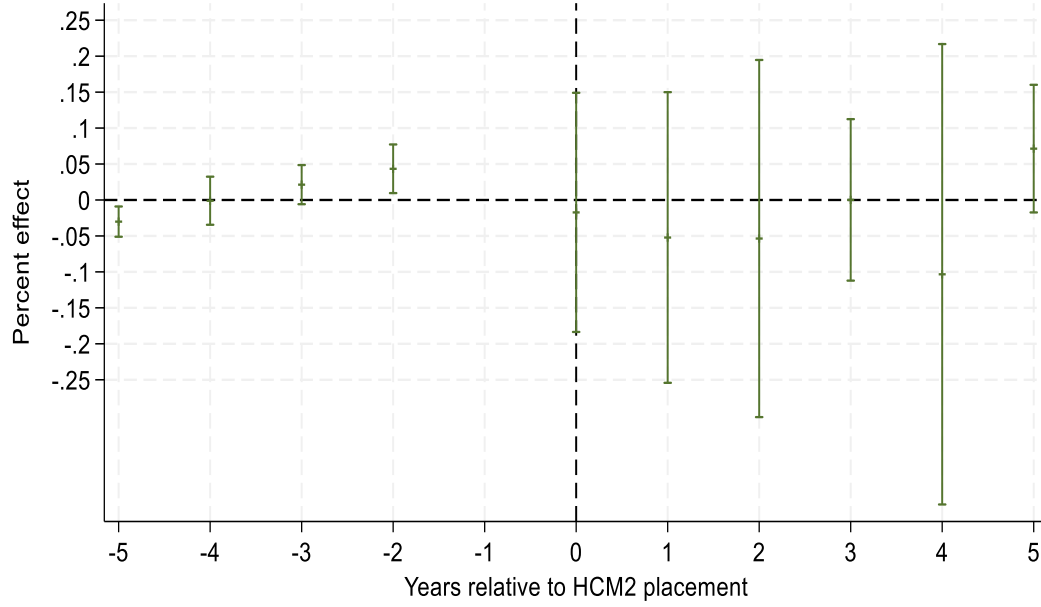
Appendix 3: Effect of HCM2 on student debt (alt sample)



Appendix 4: Effect of HCM2 on graduation rates (alt sample)



### Appendix 5: Effect of HCM2 on total expenses (alt sample)



\* Total expenses (log)