

Do Responsibility Center Management Budget Models Encourage Entrepreneurship? Evidence from Master's Programs at Public Universities

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Abstract: More than 50 public research universities have adopted responsibility center management (RCM) budget models that are designed to encourage units within universities to become more entrepreneurial and efficient. I compiled a longitudinal dataset of RCM announcements and implementations to examine whether universities that adopted RCM changed their portfolio of master's degree programs. There was no evidence of changes in the number or types of programs or total degrees awarded following the adoption of RCM, suggesting limits to the incentives that these budget models provide to unit leaders.

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Higher education is facing challenges on both the revenue and expenditure sides of the ledger. Public universities have become increasingly reliant on student tuition dollars to fund operations, and the share of educational funding from tuition has doubled since 1980 (Kunkle, 2024). It is challenging for universities to generate additional tuition revenue from undergraduate students due to declining enrollment since the Great Recession (National Center for Education Statistics, 2023), limited tuition increases and restrictions on increasing tuition (Kelchen & Pingel, 2024; Ma et al., 2024) alongside rising operating costs (Commonfund Institute, 2024).

These stresses have encouraged institutional leaders and governing boards to provide incentives for public universities to operate more like a business, focusing on revenue generation and cost containment. One key initiative is responsibility center management (RCM) budget models, which provide financial incentives for academic units that take entrepreneurial actions compared to traditional models that base funding on historic allocations (Curry et al., 2013; Kosten, 2016). Limited research has found that RCM models may increase the number of undergraduate credentials awarded (Jaquette et al., 2018; Rutherford & Rabovsky, 2018).

A key area of potential growth for public universities under RCM is master's degree programs. They make up nearly eight in ten graduate degrees and saw a 19% increase in the number of degrees awarded in the 2010s while undergraduate enrollment declined (National Center for Education Statistics, 2023). They are a particularly appealing target for deans and department leadership under RCM models because their curricula tend to be self-contained under individual units, meaning that a larger share of the revenue generated stays with the host unit compared to an undergraduate program where students take courses from across campus. However, only one study has examined the graduate space despite the incentives being larger to start new graduate programs. Recent research by Choi (2026) found that the number of master's

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graduates increased following the adoption of RCM, while the number of doctoral graduates decreased; however, that study did not examine the decision of whether to launch new academic programs.

Although RCM is often viewed as a mechanism to encourage departments and colleges to launch new academic programs and increase tuition revenue, the ability to keep at least a portion of cost savings also provides a possible incentive for academic leaders to close low-enrolled programs. As states such as Indiana and Ohio are encouraging or forcing institutions to close programs with few graduates (Quinn, 2025), this potential aspect of RCM budget models deserves scrutiny.

While master's programs can represent a financial benefit for universities and individual units within them, there are also concerns about the extent to which these programs deliver the same benefits to students and taxpayers. Master's programs as a whole generate positive returns on investment for students (e.g., Gándara & Toutkoushian, 2017). Recent research and media coverage has focused on programs that have high debt-to-earnings ratios at private nonprofit institutions (Delisle & Cohn, 2022; Korn & Fuller, 2021), but there are also concerns with the outcomes of some programs at public universities. One in three master's programs at public universities had debt burdens at or above 50% of earnings four years after completion (compared to just over half of all programs at private nonprofit institutions), highlighting potential concerns about return on investment (author's calculations using federal data released during negotiated rulemaking in 2025).

As details about institutional budget strategies are publicly available, public universities provide an opportunity to examine whether institutional budget models incentivize the creation of new master's programs and whether these new programs at RCM-adopting universities yield

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economic benefits for students. These general findings are likely to apply more broadly across higher education as many institutions seek to improve efficiency and generate new revenue.

Given the limited understanding of the effects of RCM, my research questions are the following:

- (1) Do public research universities that implement RCM budget models change their number of master's degree programs or the number of graduates at different rates than universities that do not?
- (2) Are there differences in the types of master's degree programs and the return on investment for these programs between universities that implement RCM and those that do not?

Literature Review and Theoretical Framework

Universities have traditionally allocated funds from the central administration to academic units based on allocations received in the previous year, with the only way for units to receive additional funding being through making special requests of institutional leadership. RCM was designed as a decentralized budgeting model that assigns financial responsibility to individual academic units, allowing them to manage their own revenues and expenses while contributing to shared institutional costs. The goal of RCM is that by creating incentives for units to act strategically, both the unit and the university would see benefits (Lang, 2016).

The adoption of decentralized budget models such as RCM come with potential benefits for universities. Some of the stated benefits include encouraging entrepreneurial behavior, enhancing transparency, and incentivizing revenue generation through program expansion and enrollment growth. However, there are significant potential drawbacks to adopting a RCM budget model. These concerns include increased competition between departments, potential neglect of non-revenue-generating disciplines, and challenges in managing centralized costs

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Strauss & Curry, 2002). As a result, RCM budget models typically operate in a hybrid form that includes a portion of funds being withheld by central administration to help fund units that may not be able to balance their own budgets or initiatives like strategic planning or financial aid that require some level of centralization (Fethke & Policano, 2019). This hybrid model is similar to state funding for public higher education, in which the majority of states using performance funding systems operate hybrid budget models with some funding tied to adjustments to the current base (Kelchen et al., 2024).

While there are descriptive studies examining trends in institutional outcomes after adopting RCM (e.g., Curry et al., 2013; Decker, 2023), there is limited research examining the effects of RCM on institutional outcomes. Using a synthetic control model, Jaquette et al. (2018) found that three of the four examined public universities that implemented RCM in the late 2000s saw increases in tuition revenue within the next five years. Rutherford and Rabovsky (2018) examined 32 public and private research universities that adopted RCM before 2013 using linear regressions with two-way fixed effects. They concluded that implementing RCM was associated with higher bachelor's degree graduation rates for White students and additional STEM degrees produced, while other racial/ethnic groups and fields of study were unaffected.

The closest analogue to this study is newly-published research by Choi (2026) that examined whether RCM models increased the number of bachelor's, master's, and doctoral degrees produced by public research universities. He found no effects for bachelor's degree production, but an increase in the number of master's degrees alongside a decrease in the number of doctoral degrees. Notably, there were differences by field of study, with STEM and health master's and doctoral degree production being more affected than humanities and business degrees. However, that research did not examine whether the number of programs changed,

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meaning that the effects could be driven by either changes in recruitment strategies for existing programs or the number of programs available to students.

This research is motivated by two key theories that explain why public universities may respond to RCM budget models by launching new master's degree programs. The rationale for RCM program adoption meshes with new public management (NPM), which came about in the late 1970s and early 1980s as government agencies were being encouraged to act like businesses by thinking like entrepreneurs and cutting costs (Hood, 1991; Moynihan, 2006). This also fits with performance funding, a prominent funding model in public higher education that ties a portion of state funding to student outcomes (Rosinger et al., 2022). By transferring a portion of risk and rewards onto individual units, the goal of RCM—in line with NPM—is to encourage departments and colleges to launch new programs so they can receive additional support.

Academic capitalism (e.g., Slaughter & Leslie, 1997; Slaughter & Rhoades, 2004) is a theory that posits that universities take on entrepreneurial actions in order to garner additional resources as well as attain status. RCM provides more of an incentive for individual departments and colleges to follow suit by directly transferring resources from central administration to units, doubling down on pressures that already exist for unit leaders to generate results when institutional leaders operate under an academic capitalism framework (McClure, 2016; Vican et al., 2020). Prior research has found that institutions have sought to increase graduate enrollment to diversify revenue sources (Jaquette, 2013), and it also serves as a measure of prestige among academics and the public alike (Acton 2022; Miller, 2019).

Despite the growing popularity of RCM budget models at public universities, there is little research on the extent to which these models change institutional behaviors. In this work, I provide the first insights into whether university and academic unit leaders respond to RCM

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models by launching master's degree programs to generate additional revenue and whether these programs have similar returns on investment to programs launched outside RCM models.

Sample, Data, and Methods

To examine whether the adoption of responsibility center management budget models induces academic units to change their portfolio of master's degree programs, I compiled a panel of RCM adoptions, the number of programs reporting graduates, and institutional characteristics between the 2004-05 and 2023-24 academic years. Details about my sample, data, and methods are in the following section.

Sample

My analytic sample began with 160 public universities that were classified as research/doctoral institutions in the 2000 Carnegie classifications. RCM budget models are generally designed for large research universities where cost structures and outputs differ substantially across academic units, and prior research on RCM models has shown that the vast majority of public and private institutions that employ RCM are research universities (e.g., Rutherford & Rabovsky, 2018). My data collection efforts also found the same to be true within public higher education: only eleven public non-research universities ever adopted RCM between 2004 and 2023. I focused on public universities because data on institutional budget models are typically available on public-facing websites, while private universities often do not publish these details.

I then excluded six universities (Maine, Missouri, Nebraska, Wayne State (MI), Wright State, and Wyoming) that made serious efforts to implement RCM, but never followed through due to financial challenges or leadership turnover. An example of this is the University of

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Nebraska, which recommended moving to RCM in 2017 and created a steering committee and hired Huron Consulting to implement the model in 2019. Yet the model was delayed due to the pandemic and the revised implementation date of 2022 was scrubbed on account of leadership changes; their budget model website was taken offline in late 2024 or early 2025 (University of Nebraska-Lincoln, 2024). This resulted in an analytic sample of 154 institutions, of which 58 adopted RCM and 96 did not.

Data

A research assistant and I collected data on the presence of RCM budget models at public universities, using data collection guidelines in education policy research specified by Kelchen et al. (2019) as a template. We first went to each institution's website and examined budget websites, board minutes, and financial documents for any mentions of budget models. We then used the Internet Archive: Wayback Machine to examine archived versions of these websites to learn more about the date of documentation. Finally, we used Google searches and internal website searches for terms such as "responsibility center management" and "budget model" if information was not present.

We coded a university as having adopted RCM if we found clear evidence that institutional budgeting was at least partially decentralized, providing academic units with revenue based on student enrollment and then levying charges to help support administrative units on campus (such as information technology and the provost's office) that are not designed to produce revenue. If there was no evidence of RCM or clear evidence of an incremental model, we included the institution in the comparison group.

Further distinguishing these data from prior research on RCM (Choi, 2026; Jaquette et al., 2018; Rutherford & Rabovsky, 2018), we coded the date of the first available public

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announcement of a move to an RCM budget model as well as the year in which RCM was first used. The final adoption year—the main metric in these analyses—excludes so-called “shadow years” in which the old and new budget models run simultaneously for informational purposes but only the old budget model is used to allocate funds. I ran alternative analyses based on the announcement date and the results are similar to the primary analysis.

Figure 1 shows the trend in the number of public research universities with RCM budget models between the 2004-05 and 2023-24 academic years. The number of adopters slowly increased from 13 in 2004-05 to 23 in 2013-14 before increasing rapidly to 58 universities by 2023-24, with nine additional universities transitioning to RCM as of that period. Overall, more than one-third of all public research universities adopted RCM by the 2023-24 academic year, with less than three percent of public non-research universities having done so. Appendix 1 provides a list of institutions that have adopted RCM, as well as those which announced a transition to RCM but had not yet implemented RCM as of 2023-24.

[Insert Figure 1 here]

The key outcome of interest was the number of master’s programs at public universities, using IPEDS completions data measured at the Classification of Instructional Programs (CIP) code and crosswalked among the 2000, 2010, and 2020 versions at the six-digit CIP level. After doing the crosswalk, I collapsed programs to the four-digit CIP level because six-digit CIP codes can reflect specialties within one academic program.² For example, four-digit CIP codes within business include accounting, finance, and marketing. Within marketing, six-digit CIP codes include general marketing, market research, international marketing, digital marketing, and other

² There were three programs of study that graduated 67,918 students in 2020-21---with nursing education making up nearly 85% of the students---that moved six-digit CIP codes between the 2010 and 2020 classifications into a four-digit CIP code with existing six-digit CIP code. I excluded those programs from this analysis because some outcomes are only at the four-digit CIP level.

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marketing. Throughout the panel, about 15% of four-digit CIP codes housed more than one six-digit CIP code (Blagg et al., 2021). Because academic units can potentially respond to the incentives present in RCM by adding or eliminating programs, I considered both the number of new programs and the number of discontinued programs as separate outcomes.

A caveat of IPEDS completions data is that programs typically do not show up in the dataset until they have produced their first graduate, even though they started earlier. I proxied for the starting date of these programs with the academic year prior to graduation (for example, a program that first produced graduates in the 2014-15 academic year likely would have started in the 2013-14 academic year), adjusting the analyses accordingly to match with the potential starting date. For programs that were discontinued, I used the same coding scheme.

Another caveat is that approximately one-third of the programs that appear in raw IPEDS data to have been discontinued for a period of time during the panel were not actually discontinued. This occurred when a university did not report data on the number of graduates for that program, even when the program produced a sizable number of graduates in adjoining years and still had a presence in institutional catalogs and on websites. I adjusted for this issue, which is particularly salient in earlier years of the panel, by assigning these likely data errors to be continuing programs with zero graduates. This likely undercounts the number of graduates, but accurately counts the number of programs in existence. Running models with missings instead of zeroes generates similar results for the number of graduates, so this decision is not driving the results.

In addition to examining the total number of programs, I considered the number of programs by broad field of study. This is important because disciplines vary considerably in terms of their cost structures and return on investment (e.g., Hemelt et al., 2021; Minaya et al.,

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2024), as well as often being organized under common academic units/colleges that are incentivized under RCM models. I divided programs into education (two-digit CIP code of 13), STEM (1, 3, 11, 14, 15, 26, 27, 40, and 41), health (51), business (52), social sciences/liberal arts (5, 9, 16, 23, 24, 30, 38, 42, 44, 45, 50, and 54), and other (all else).³

I used two different return on investment metrics in this analysis to examine whether RCM-adopting institutions saw a higher share of their programs generate larger payoffs for students. I used College Scorecard debt data on debt and earnings at the four-digit CIP level that are available for five cohorts graduating from the 2014-15/2015-16 through the 2018-19/2019-20 academic years (each cohort includes data from two years of graduates). The first metric was based on median debt-to-earnings ratios using earnings from approximately one-year following completions. Approximately one-third of programs had a low (good) debt-to-earnings ratio of less than 50% during those five years. The second metric was based on whether programs had median earnings of at least \$66,600—representing the median earnings of bachelor’s degree recipients aged 25-34 who worked full-time in 2022 (National Center for Education Statistics, 2024) and serving as a rough proxy for value-added earnings similar to new accountability measures passed by Congress in 2025.⁴ Again, roughly one-third of programs had higher earnings.

For each four-digit CIP code, I used the average debt-to-earnings and earnings threshold outcome across all programs reporting data to generate a program-level average. I then applied

³ The Department of Homeland Security maintains a list of programs designated as STEM for the purposes of Optional Practical Training extensions for international students (Homeland Security Investigations, 2024). CIP codes 14, 26, 27, and 40 are automatically included as STEM, and many six-digit CIP codes under 1, 3, 11, 15, and 41 also qualify. As a result, I classify these under STEM. There are also a few six-digit CIP codes in other fields, such as cognitive psychology (42.2701) and econometrics (45.0603) that also qualify as STEM. However, I place these fields under the non-STEM classification to match how they are often perceived and because earnings data are only available at the four-digit CIP code level that combine STEM-designated and non-STEM designated programs.

⁴ I also ran models using median earnings of master’s degree holders age 25-34 (\$80,200). The results were very similar and are available upon request.

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that average to all institutions with a program in that CIP code to generate estimates of higher-performing and lower-performing programs from a ROI perspective. This approach allows for all programs to be broadly classified during the panel in spite of outcomes data only being collected near the end of the panel, and also reflects general information on debt and earnings that would be available to institutional and unit leaders when they are considering launching new academic programs.

I controlled for several factors that could also affect whether a public university adopted RCM budget models or whether they added new academic programs. Institutional characteristics (all from IPEDS) included (logged) full-time equivalent enrollment, the percent of undergraduate students, racial/ethnic and gender diversity, admit rates, (logged) total revenue per FTE, (logged) state funding per FTE, and tuition as a share of total revenue. State and system-level characteristics included the presence of a funded PBF system (Rosinger et al., 2022), the presence of a tuition freeze (Kelchen & Pingel, 2024), state poverty rate and (logged) per-capita income (from the Census Bureau), and Republican or Democratic unified control of state governance (from the National Conference of State Legislatures).⁵ All financial variables were logged for analyses and adjusted for inflation into 2024 dollars using the Consumer Price Index.

Methods

To analyze the relationship between RCM budget models and the creation of new master's degree programs, I used an event study framework to account for institutions adopting the treatment in different years and thus having different amounts of pre-treatment data (de Chaisemartin & D'Haultfoeuille, 2023; Goodman-Bacon, 2021). I used the *did_multiplegt_dyn* command in Stata (de Chaisemartin & D'Haultfoeuille, 2025) that generates heterogeneity-

⁵ Following research by Masket and Shor (2015), I coded Nebraska's ostensibly nonpartisan legislature as being under unified Republican control.

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robust estimates. It also provides a simple joint test for the total treatment effect during the ten years following the reference year (the year prior to treatment, which represents the number of programs in existence in the treatment year after adjusting for using completions data as a proxy for program existence). While there are fewer RCM models that have been in place for a full decade, examining outcomes over a longer window allows for plenty of time for programs to go through the curricular development process, gain necessary approvals from accreditors and state higher education agencies, and recruit students.

One challenge in examining the effects of institutional policy adoptions is that adoptions are often correlated with metrics that could also affect the outcome of interest. To help to account for the possibility of differential selection, I used inverse probability treatment weights (IPTW) (e.g., Huber, 2014; Wooldridge, 2007). Following best practices in event study models (de Chaisemartin & D'Haultfoeuille, 2025), I estimated the probability of ever adopting RCM (*prob_rcm*) using a probit model and the covariates from the first year of the panel in 2004-05 to reduce the potential effects of RCM adoption on those values. The observations are then weighed in the following ways:

Ever adopted: $(1/prob_rcm)$

Never adopted: $1/(1-prob_rcm)$

Table 1 shows the summary statistics of the sample when IPTW weights are applied, while Appendix 2 shows unweighted summary statistics. Because the universe of public research universities is relatively small, there are still some differences in characteristics between ever-treated and never-treated institutions. Universities that adopted RCM at some point during the preceding two decades were larger, had more master's programs and graduates, and received less

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in per-student state funding than non-adopters; these differences were attenuated but not completely eliminated through the use of IPTW.

[INSERT TABLE 1 HERE]

I estimated models for the overall number of master's programs, by field of study, and by return on investment as well as for the total number of graduates of master's programs. All models also include the control variables listed in Table 1, institution and year fixed effects, and state-clustered standard errors (Cameron & Miller, 2015).

To address potential concerns about parallel trends between the treatment and comparison groups, I ran event study models using key institutional covariates (logged FTE enrollment, the percentage of Black undergraduates, total revenue per FTE, and state funding per FTE) that showed some differences between the ever-RCM and never-RCM groups during the entire panel in Table 1 as outcomes. As shown in Appendix 3, there are no consistent pre-treatment trends for these characteristics, supporting the parallel trends assumption.

Limitations

In addition to the limitations previously noted regarding the return on investment metrics and observing programs using completions data, there are two other noteworthy limitations based on the RCM data used in this analysis. The first limitation is that the strength of incentives provided to individual units under RCM varied in important (and often unobservable) ways. Some key details of RCM models include the distribution of tuition revenue to the unit of instruction versus the student's home unit, the level of support unit costs, the tax rate placed on units to help support strategic initiatives, and a university's willingness to provide subsidies to unprofitable academic programs or colleges. I found evidence that these parameters varied

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considerably across institutions (and even within the same university over time), but insufficient information was available at a majority of universities to be able to code up these variables to examine dosage.

The second limitation is that institutions in the comparison group also use a variety of budgeting strategies that provide different incentives for individual units. Universities sometimes allow units to retain revenue for new programs (especially online programs) under a more centralized or base-adjusted budget model, and faculty hiring initiatives tied to new program creations can also encourage units to increase their number of offerings. Essentially, both traditional and RCM budget models operate with a range of available incentives for entrepreneurial units, but RCM models typically are marketed as having larger incentives. As a result, the comparison between RCM and non-RCM institutions is of interest even if the size of incentives is unknown.

Results

I began by estimating event study models to examine the effect of RCM implementation on the total number of master's degree programs (Figure 2) and the number of graduates (Figure 3). In both cases, there is no clear evidence that moving to an RCM budget model encouraged public research universities to become more entrepreneurial. The total average treatment effect (across all treated periods) was an increase of 0.19 programs and a 1.9 percent increase in the number of graduates, neither of which approached statistical significance as effects of roughly two programs and five percentage points can be identified in most years. Turning to the announcement of RCM instead of the adoption of RCM (Appendix 4) yielded a marginally significant increase in the number of graduates of 3.9 percent, but there was again no change in the number of programs.

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[Insert Figures 2 and 3 here]

Figures 4 and 5 show the event study estimates of the effects of RCM on the number of new and dropped programs. The pattern of findings across both new (Figure 4) and dropped (Figure 5) program is quite similar, with there being no consistent evidence of changes in programs after the adoption of RCM. The event study models are generally powered to detect an effect of one program per year (although the confidence intervals widen in later years due to fewer treatment observations coming from earlier years of the panel), and the coefficients are nowhere near approaching statistical significance.

[Insert Figures 4 and 5 here]

Table 2 contains the coefficients for the event study estimates of the effects of RCM on the number of programs offered by broad field of study. There is again no consistent evidence that RCM implementation led units within institutions to start more new programs, and there are no meaningful differences in the coefficients or patterns across different fields of study. This suggests that broad academic units do not necessarily respond to the market incentives that are supposed to be a hallmark of RCM budget models.

[Insert Table 2 here]

Finally, I examined whether RCM budget models induce units within universities to increase their program offerings in high-ROI (measured by debt-to-earnings ratios and overall earnings) versus low-ROI fields. Similar to the other results, there are no effects of RCM on the number of higher-value or lower-value programs offered. There are some indications that lower-value programs may have increased in number slightly more than higher-value programs. These trends are not statistically significant, but are worth keeping an eye on to see if they continue in the future.

Conclusion

A growing number of public universities are adopting responsibility center management budget models in an effort to encourage entrepreneurship and efficient operations. I provide the first independent national data on RCM implementation trends at public universities in this paper, finding that 58 research universities had RCM budget models in effect by fall 2023. At the same time, the number of master's programs increased by 44% at public research universities between 2004-05 and 2021-22 (Kelchen & Barrett, 2026), reflecting a broader trend of public universities trying to diversify revenue sources and increase enrollment.

These two trends led me to examine whether RCM budget model adoption is contributing to changes in the number of master's degree programs. After using modern event study techniques alongside inverse probability treatment weights that account for the baseline likelihood of adopting RCM, I did not find evidence that public research universities that implemented RCM increased the number of master's degree programs or graduates; similarly, these universities did not see more programs eliminated as a potential efficiency measure. This runs somewhat counter to smaller-scale research on early RCM adopters by Jaquette et al. (2018) that found an increase in net tuition revenue at three of four examined institutions. Given that there is a reasonable hypothesis to expect a relationship between RCM and the number of master's programs, the obvious question then becomes why that relationship did not exist in my analyses. I offer two potential rationales below, both of which are potential avenues for future research.

First, the upfront costs of launching new academic programs (especially at the four-digit CIP level instead of the six-digit CIP level) are substantial. This requires new faculty and staff, investments in recruitment and facilities, and approvals from university administration,

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accreditors, and state higher education agencies. Even when units receive a portion of the revenue from growing academic programs, they may lack the upfront resources needed to start a new program. Online program management (OPM) companies that help launch programs in exchange for either a share of future revenue or fees throughout the life of the contract can help reduce those upfront costs and provide needed expertise in starting online programs, but also come with concerns about ethical recruiting and actual revenue received (Hamilton et al., 2023; Sun et al., 2024). Although OPM usage has declined in recent years (Palmer, 2025) and program-level IPEDS data on online offerings are only available for part of the panel, it would still be a useful extension of this research.

Second, there may be insufficient incentives (actual or perceived) provided by RCM budget models to induce individuals to launch new programs. Department faculty members, who are often responsible for developing and approving curriculum, often do not see direct benefits from changes to funding models and thus may not be moved by a new budget model. Research supporting this hypothesis from performance funding implementation (e.g., Dougherty et al., 2014) raises questions about faculty buy-in under RCM. Deans and department heads, who should be more aware of RCM, are motivated by whether they think the promised incentives (such as additional revenue) will actually be provided. Given the declining terms of college presidents (Melidona et al., 2023), and concerns about institutional budgets, the viewpoints of both faculty and administrators should be examined in future research.

Given the growing popularity of RCM and the rise of consulting firms that specialize in providing models to universities that they can then tweak as needed, research is needed on the effects of different model parameters (such as the share of tuition revenue going to units and the tax rate to support central administration). While data were not available for all institutions using

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RCM, it became clear during my data collection that quite a few universities were using a common framework developed by Huron Consulting before making changes locally.

Understanding those changes—and whether they affect key outcomes such as tuition revenue and the number of academic programs—is important for institutional leaders. It is also important to examine private nonprofit institutions, although it is nearly impossible to get details about model parameters for most universities in that sector.

Finally, my data collection found that several universities abandoned years-long efforts to implement RCM during previous periods of budget shortfalls. This matches research on state funding models that found a higher likelihood that states retrenched from complicated formulas to across-the-board cuts in recessions (Kelchen et al., 2024). As a result, RCM budget models are likely to face stress as the Trump administration limits graduate student lending, federal research funding, and international student enrollment. Temple University, for example, announced in 2025 that it would move away from RCM in order to better address a growing budget deficit (Fry, 2025). Research is needed to examine whether moving away from RCM budget models achieves institutional objectives.

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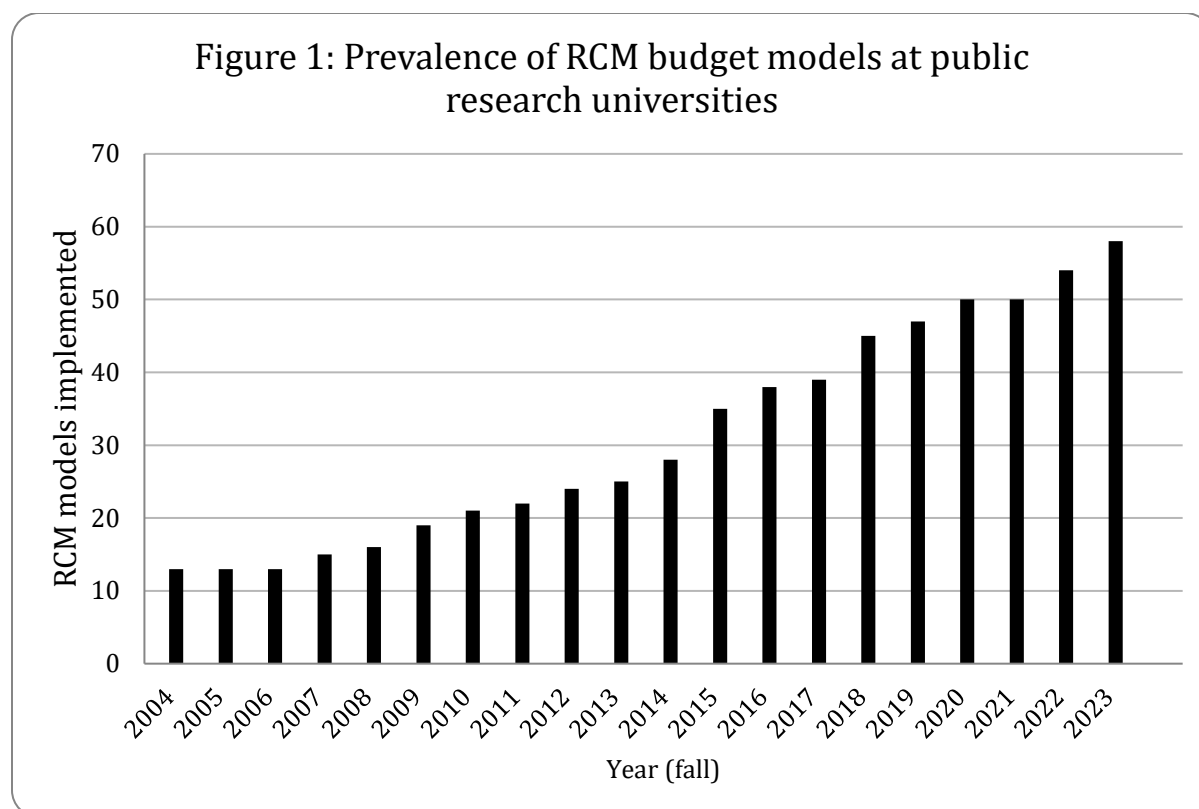
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Source: Author's data collection using institutional websites and the Wayback Machine.

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Table 1: IPTW-weighted summary statistics of the dataset, 2004-05 to 2023-24.

Characteristic	Ever had RCM budget model		Never had RCM budget model	
	Mean	(SE)	Mean	(SE)
Total master's programs	63.2	(0.6)	56.3	(0.6)
Total number of graduates	1,775	(64)	1,345	(20)
Added programs	1.4	(0.1)	1.2	(0.1)
Dropped programs	0.6	(0.1)	0.5	(0.1)
<u>Programs by field of study</u>				
Education	6.0	(0.1)	5.3	(0.1)
STEM	14.2	(0.2)	13.4	(0.2)
Health	4.9	(0.1)	4.1	(0.1)
Business	4.4	(0.1)	3.8	(0.1)
Social science/liberal arts	20.3	(0.2)	18.3	(0.2)
Other	13.3	(0.2)	11.5	(0.2)
<u>Programs by student ROI</u>				
<50% debt-to-earnings ratio	20.3	(0.2)	18.4	(0.2)
>50% debt-to-earnings ratio	37.1	(0.3)	32.7	(0.3)
Earnings above \$66,600	22.7	(0.3)	19.6	(0.2)
Earnings below \$66,600	37.1	(0.4)	33.7	(0.3)
<u>Institutional characteristics</u>				
FTE enrollment	26,850	(574)	22,398	(309)
Percent undergraduate	80.6	(0.3)	82.7	(0.1)
Asian undergrads (pct)	8.8	(0.4)	8.2	(0.2)
Black undergrads (pct)	7.9	(0.3)	10.9	(0.3)
Hispanic undergrads (pct)	12.8	(0.6)	11.2	(0.3)
White undergrads (pct)	63.1	(1.0)	62.0	(0.5)
Female undergrads (pct)	53.3	(0.2)	52.0	(0.2)
Admit rate (pct)	70.8	(0.7)	67.8	(0.5)
Total revenue per FTE (\$)	65,276	(1,753)	57,780	(906)
State funding per FTE (\$)	10,503	(198)	11,754	(162)
Tuition share of total revenue (pct)	26.6	(0.4)	26.0	(0.2)
<u>State/system characteristics</u>				
Funded PBF system (pct)	39.4	(2.1)	27.7	(1.3)
Tuition freeze (pct)	14.4	(1.5)	15.8	(0.9)
State poverty rate (pct)	13.0	(0.1)	13.6	(0.1)
State per-capita income (\$)	60,311	(306)	60,381	(265)

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Democratic unified control (pct)	15.8	(1.2)	23.8	(1.1)
Republican unified control (pct)	54.7	(2.0)	42.3	(1.3)
Number of universities	54		100	

Sources: College Scorecard (debt and earnings data), authors' data collection (RCM), Rosinger et al. (2022) and author's data collection (PBF system), Kelchen & Pingel (2024) (tuition freeze), Bureau of Economic Analysis (state income/poverty), National Conference of State Legislatures (state partisan control, Integrated Postsecondary Education Data System (all others).

Notes:

(1) Observations are weighted by inverse probability treatment weights using institutional characteristics (fixed in 2004-05) as controls.

(2) All financial values are adjusted for inflation into 2024 dollars using the Consumer Price Index.

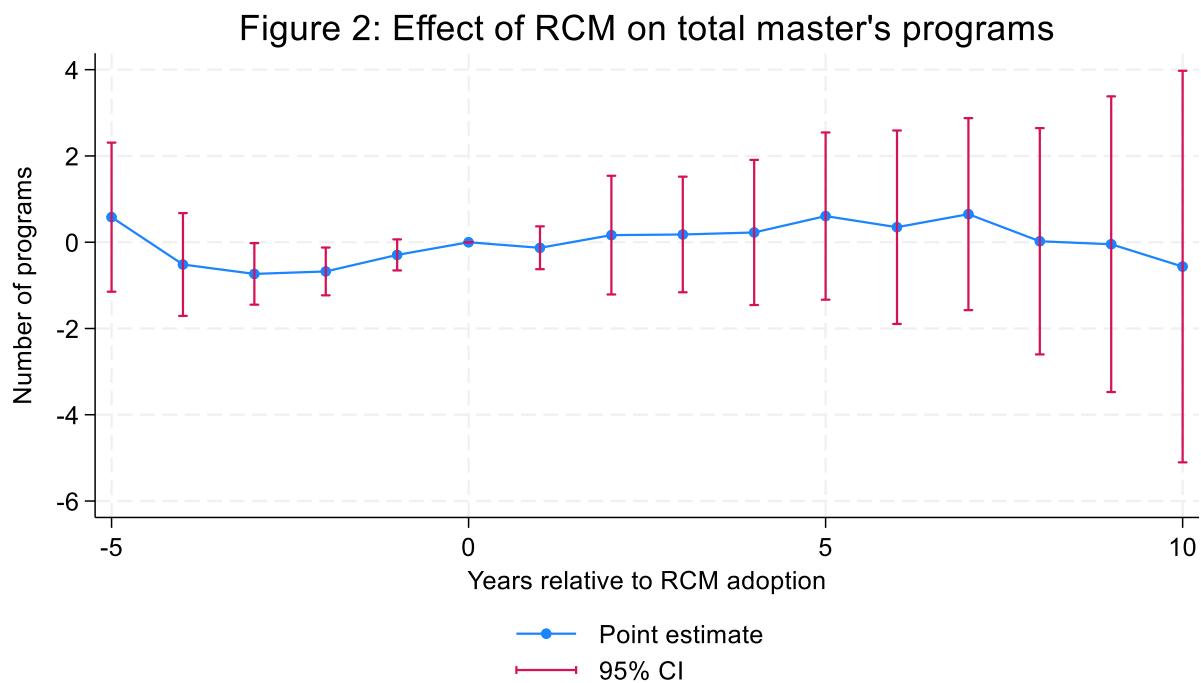
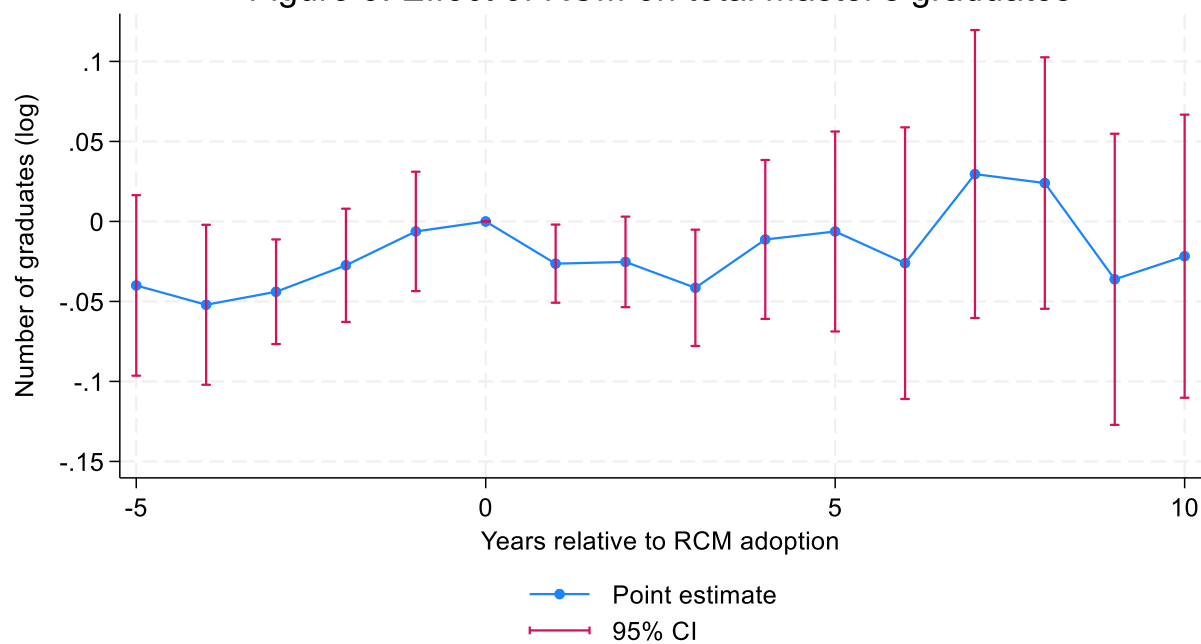
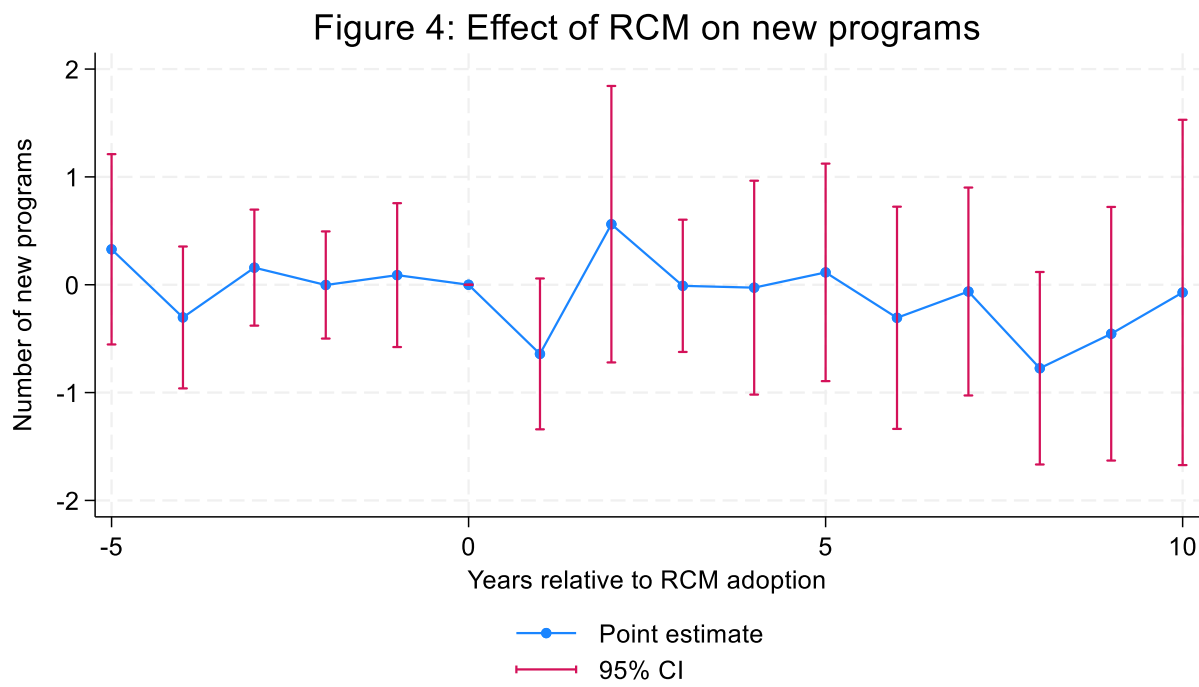


Figure 3: Effect of RCM on total master's graduates





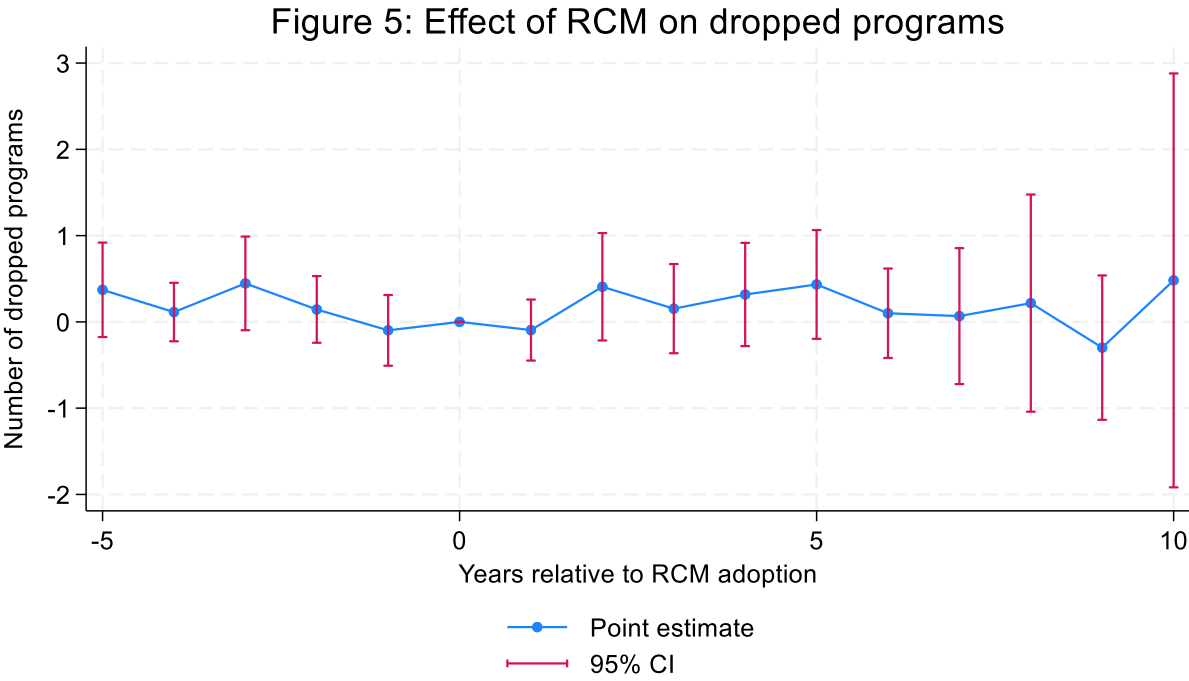


Table 2: Event study estimates of the effects of RCM adoption on the number of master's programs by field of study.

Time period (t is reference)	Education	STEM	Health	Business	Soc sci/lib arts	Other
t-5	0.14 (0.09)	0.01 (0.35)	0.05 (0.17)	0.12 (0.14)	0.13 (0.21)	0.12 (0.35)
t-4	0.06 (0.18)	-0.02 (0.19)	0.06 (0.16)	-0.01 (0.14)	-0.30 (0.34)	-0.30 (0.30)
t-3	-0.09 (0.15)	0.05 (0.14)	0.01 (0.13)	-0.10 (0.12)	-0.43 (0.21)	-0.18 (0.19)
t-2	-0.03 (0.11)	0.04 (0.12)	0.00 (0.10)	-0.06 (0.09)	-0.29 (0.15)	-0.33 (0.16)
t-1	-0.11 (0.09)	0.08 (0.06)	0.07 (0.05)	0.03 (0.04)	-0.18 (0.10)	-0.18 (0.15)
t+1	-0.07 (0.06)	-0.05 (0.08)	-0.15 (0.50)	0.03 (0.07)	0.09 (0.18)	0.01 (0.12)
t+2	0.01 (0.13)	0.02 (0.20)	-0.06 (0.12)	-0.01 (0.13)	0.07 (0.21)	0.14 (0.29)
t+3	-0.08 (0.11)	-0.19 (0.20)	0.11 (0.19)	-0.01 (0.16)	0.17 (0.27)	0.17 (0.22)
t+4	-0.06 (0.12)	-0.30 (0.27)	0.04 (0.21)	0.04 (0.16)	0.17 (0.34)	0.34 (0.29)
t+5	0.09 (0.14)	-0.37 (0.36)	-0.04 (0.20)	0.02 (0.18)	0.48 (0.45)	0.42 (0.37)
t+6	0.08 (0.15)	-0.61 (0.40)	-0.18 (0.20)	0.05 (0.22)	0.48 (0.58)	0.53 (0.40)
t+7	-0.03 (0.16)	-0.50 (0.42)	-0.09 (0.24)	0.13 (0.21)	0.30 (0.61)	0.84 (0.37)
t+8	-0.13 (0.18)	-0.63 (0.55)	-0.19 (0.25)	-0.03 (0.20)	0.22 (0.58)	0.78 (0.42)
t+9	-0.05 (0.24)	-0.44 (0.77)	-0.25 (0.37)	0.14 (0.20)	-0.22 (0.62)	0.78 (0.53)
t+10	-0.56 (0.41)	-0.97 (0.86)	-0.53 (0.51)	0.53 (0.39)	0.07 (0.98)	0.90 (0.62)
Total treatment effect	-0.05 (0.12)	-0.33 (0.29)	-0.10 (0.16)	0.05 (0.12)	0.21 (0.34)	0.40 (0.26)
Number of observations	2,022	2,022	2,022	2,022	2,022	2,022
Max number of switchers	39	39	39	39	39	39

Notes:

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- (1) All regressions control for the coefficients found in Table 1, have institution and year fixed effects, use state-clustered standard errors, and are weighted using inverse probability treatment weights.
- (2) Financial values are logged and adjusted for inflation into 2024 dollars using the Consumer Price Index.
- (3) These were generated using the `did_multiplegt_dyn` command in Stata (de Chaisemartin & D'Haultfoeuille, 2025) that allows for multiple treatment spells and heterogeneity-robust estimates.

Table 3: Event study estimates of the effects of RCM adoption on the number of master's programs by high-ROI status.

Time period (t is reference)	Debt-to-earnings ratio		1-year post-grad earnings	
	Below 50%	Above 50%	Above \$66,600	Below \$66,600
t-5	0.19 (0.39)	0.09 (0.67)	0.05 (0.55)	0.26 (0.71)
t-4	-0.19 (0.30)	-0.41 (0.54)	-0.06 (0.42)	-0.45 (0.62)
t-3	-0.15 (0.21)	-0.51 (0.37)	0.11 (0.27)	-0.80 (0.40)
t-2	-0.11 (0.15)	-0.49 (0.25)	0.06 (0.21)	-0.63 (0.30)
t-1	-0.02 (0.13)	-0.24 (0.14)	0.07 (0.14)	-0.30 (0.14)
t+1	0.13 (0.14)	-0.25 (0.15)	-0.12 (0.14)	0.02 (0.15)
t+2	0.17 (0.21)	0.06 (0.44)	0.06 (0.24)	0.16 (0.51)
t+3	-0.06 (0.25)	0.26 (0.40)	-0.03 (0.37)	0.21 (0.48)
t+4	-0.15 (0.31)	0.51 (0.50)	0.00 (0.44)	0.24 (0.53)
t+5	-0.14 (0.37)	0.93 (0.63)	-0.10 (0.40)	0.68 (0.63)
t+6	-0.16 (0.42)	0.79 (0.77)	-0.34 (0.47)	0.75 (0.73)
t+7	0.06 (0.41)	0.91 (0.79)	-0.06 (0.47)	0.95 (0.86)
t+8	0.04 (0.48)	0.62 (0.66)	-0.45 (0.60)	0.91 (0.81)
t+9	0.38 (0.63)	0.34 (0.82)	-0.09 (0.78)	0.44 (0.92)
t+10	0.11 (0.72)	-0.25 (1.41)	-0.57 (0.86)	0.29 (1.26)
Total treatment effect	0.02 (0.28)	0.38 (0.46)	-0.13 (0.32)	0.43 (0.54)
Number of observations	2,022	2,022	2,022	2,022
Max number of switchers	39	39	39	39

Notes:

DO RCM BUDGET MODELS ENCOURAGE ENTREPRENEURSHIP?

- (1) All regressions control for the coefficients found in Table 1, have institution and year fixed effects, use state-clustered standard errors, and are weighted using inverse probability treatment weights.
- (2) Financial values are logged and adjusted for inflation into 2024 dollars using the Consumer Price Index.
- (3) These were generated using the `did_multiplegt_dyn` command in Stata (de Chaisemartin & D'Haultfoeuille, 2025) that allows for multiple treatment spells and heterogeneity-robust estimates.
- (4) Debt and earnings are calculated using program-level medians during 2015-2020 College Scorecard data to classify CIP codes as high or low ROI.

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Appendix 1: List of RCM public research universities.

Name	Announced (fall)	Implemented (fall)
<u>RCM adopters</u>		
University of Alabama at Birmingham	2016	2018
Auburn University	2012	2015
University of Arizona	2011	2015
University of California-Davis	2011	2012
University of California-Los Angeles	pre-2004	pre-2004
University of California-Riverside	2014	2016
University of Colorado Denver	2016	2018
University of Colorado Boulder	2019	2022
University of Delaware	2007	2009
University of Central Florida	2018	2022
University of Florida	2007	2010
Georgia Institute of Technology-Main Campus	2019	2023
Idaho State University	2018	2023
University of Idaho	pre-2004	pre-2004
University of Illinois Chicago	2006	2007
University of Illinois Urbana-Champaign	pre-2004	pre-2004
Ball State University	2017	2020
Indiana University-Indianapolis	pre-2004	pre-2004
Indiana University-Bloomington	pre-2004	pre-2004
Iowa State University	2006	2008
University of Iowa	2015	2018
University of Kansas	2017	2020
Kansas State University	2016	2019
Central Michigan University	2005	2007
University of Michigan-Ann Arbor	pre-2004	pre-2004
Western Michigan University	2017	2020
University of Minnesota-Twin Cities	pre-2004	pre-2004
University of Missouri-Kansas City	2016	2018
The University of Montana	2017	2019
University of New Hampshire-Main Campus	pre-2004	pre-2004
Rutgers University-New Brunswick	pre-2004	pre-2004
Rutgers University-Newark	pre-2004	pre-2004
University of New Mexico-Main Campus	2012	2015
University of North Dakota	2012	2014
North Dakota State University-Main Campus	2021	2023

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University of Cincinnati-Main Campus	2006	2009
Kent State University at Kent	2006	2009
Miami University-Oxford	2011	2014
Ohio State University-Main Campus	pre-2004	pre-2004
Ohio University-Main Campus	2010	2015
Oregon State University	2013	2018
University of Oregon	2006	2010
University of Pittsburgh-Pittsburgh Campus	2019	2023
Temple University	2011	2014
University of South Carolina-Columbia	pre-2004	pre-2004
University of South Dakota	2010	2013
East Tennessee State University	2014	2017
University of Memphis	2013	2016
The University of Tennessee-Knoxville	2019	2022
The University of Texas at Arlington	2017	2022
Texas Tech University	2006	2011
University of Utah	pre-2004	pre-2004
University of Vermont	2012	2015
George Mason University	2014	2016
Virginia Commonwealth University	2015	2018
University of Virginia-Main Campus	2013	2015
University of Washington-Seattle Campus	2007	2012
University of Wisconsin-Madison	2013	2015

RCM announcers

Colorado State University-Fort Collins	2022
University of South Florida	2021
University of Massachusetts-Boston	2021
New Jersey Institute of Technology	2021
University of North Carolina at Chapel Hill	2023
University of Toledo	2019
University of Rhode Island	2022
Clemson University	2020
Washington State University	2020

Source: Author's data collection from institutional websites and policy documents.

DO RCM BUDGET MODELS ENCOURAGE ENTREPRENEURSHIP?

Appendix 2: Summary statistics of the dataset, 2004-05 to 2022-23.

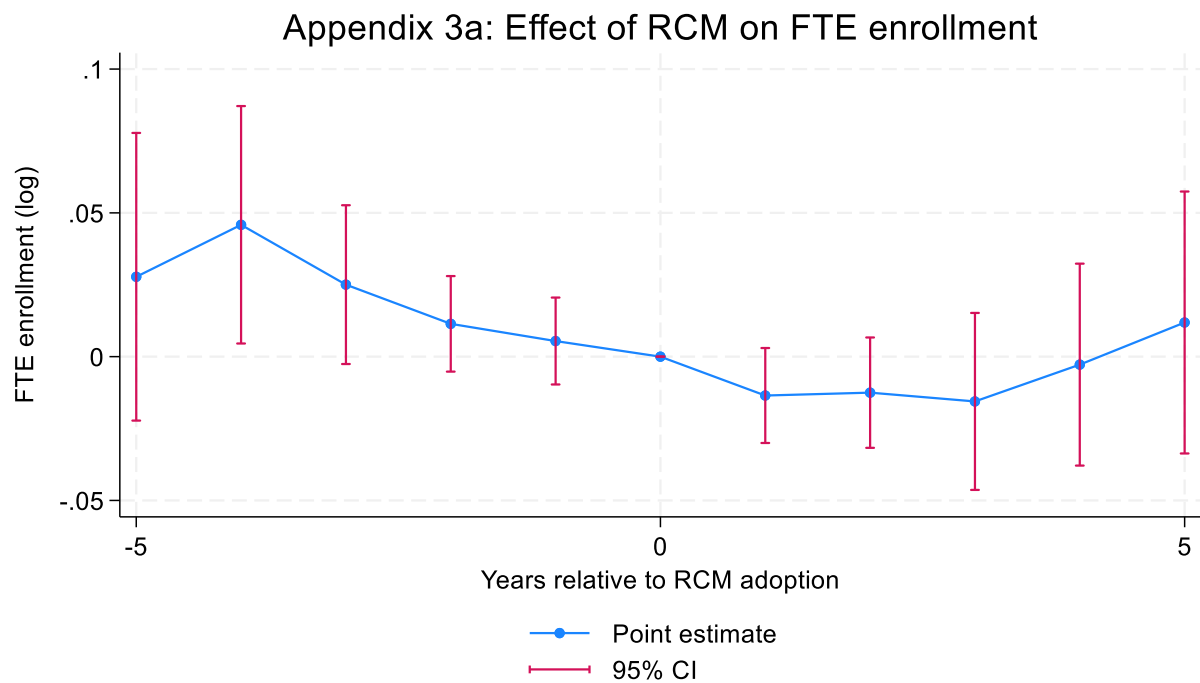
Characteristic	Ever had RCM budget model		Never had RCM budget model	
	Mean	(SD)	Mean	(SD)
Total master's programs	66.8	(20.4)	51.7	(21.3)
Total number of graduates	1,688	(1,061)	1,204	(788)
Added programs	1.5	(1.7)	1.1	(1.5)
Dropped programs	0.6	(1.2)	0.4	(1.0)
<u>Programs by field of study</u>				
Education	6.0	(2.5)	5.3	(2.5)
STEM	14.5	(7.9)	11.7	(7.1)
Health	5.9	(3.5)	3.8	(2.6)
Business	4.2	(2.2)	3.6	(2.5)
Social science/liberal arts	21.8	(7.8)	16.8	(8.6)
Other	14.5	(5.8)	10.4	(5.4)
<u>Programs by student ROI</u>				
<50% debt-to-earnings ratio	20.4	(7.0)	16.9	(7.6)
>50% debt-to-earnings ratio	39.1	(10.7)	30.5	(12.4)
Earnings above \$66,600	23.4	(9.2)	18.0	(8.7)
Earnings below \$66,600	39.0	(10.5)	31.2	(12.5)
<u>Institutional characteristics</u>				
FTE enrollment	25,874	(11,892)	19,992	(11,620)
Percent undergraduate	79.8	(7.8)	82.9	(5.8)
Asian undergrads (pct)	8.7	(9.4)	8.0	(10.0)
Black undergrads (pct)	7.0	(6.7)	14.0	(19.3)
Hispanic undergrads (pct)	9.5	(9.4)	12.2	(14.5)
White undergrads (pct)	67.0	(19.0)	58.4	(23.1)
Female undergrads (pct)	52.8	(5.4)	52.3	(8.6)
Admit rate (pct)	69.5	(17.5)	67.8	(18.5)
Total revenue per FTE (\$)	82,362	(59,181)	54,812	(33,123)
State funding per FTE (\$)	10,973	(5,372)	12,119	(6,875)
Tuition share of total revenue (pct)	25.4	(11.3)	25.6	(9.8)
<u>State/system characteristics</u>				
Funded PBF system (pct)	38.3	(48.6)	27.3	(44.6)
Tuition freeze (pct)	13.6	(34.3)	17.1	(37.6)
State poverty rate (pct)	12.1	(2.8)	13.8	(3.3)
State per-capita income (\$)	60,823	(8,884)	60,890	(10,530)
Democratic unified control (pct)	19.8	(39.9)	23.2	(42.2)
Republican unified control (pct)	46.1	(49.9)	42.2	(49.4)
Number of universities	54		100	

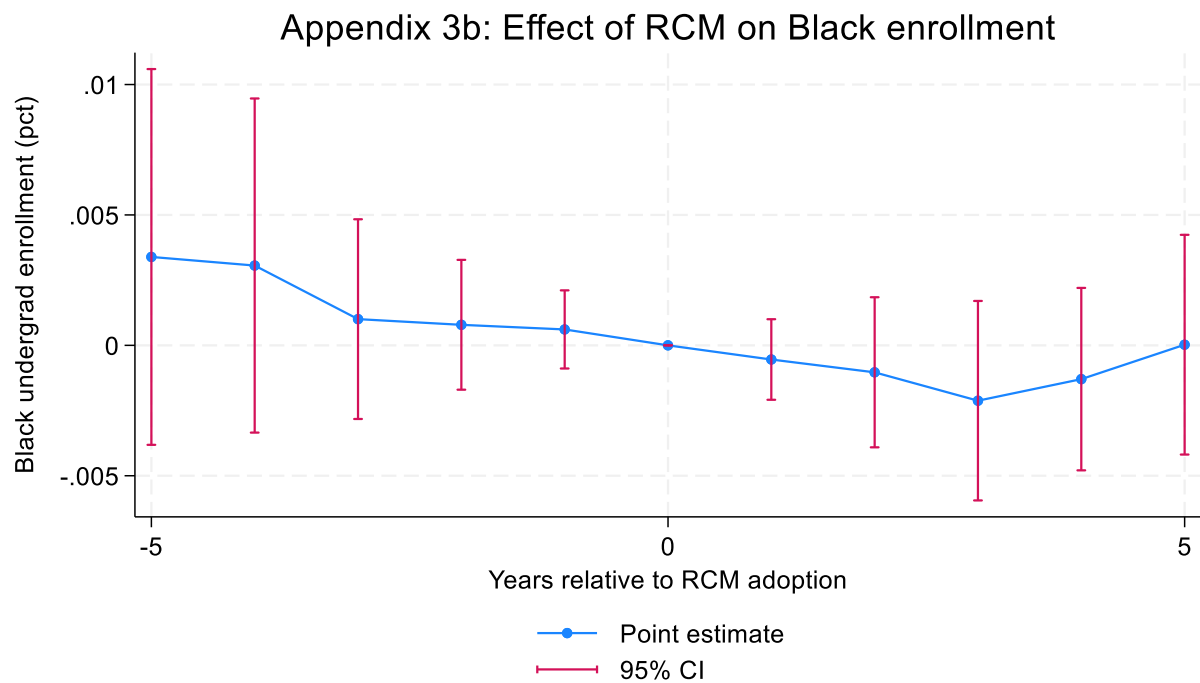
DO RCM BUDGET MODELS ENCOURAGE ENTREPRENEURSHIP?

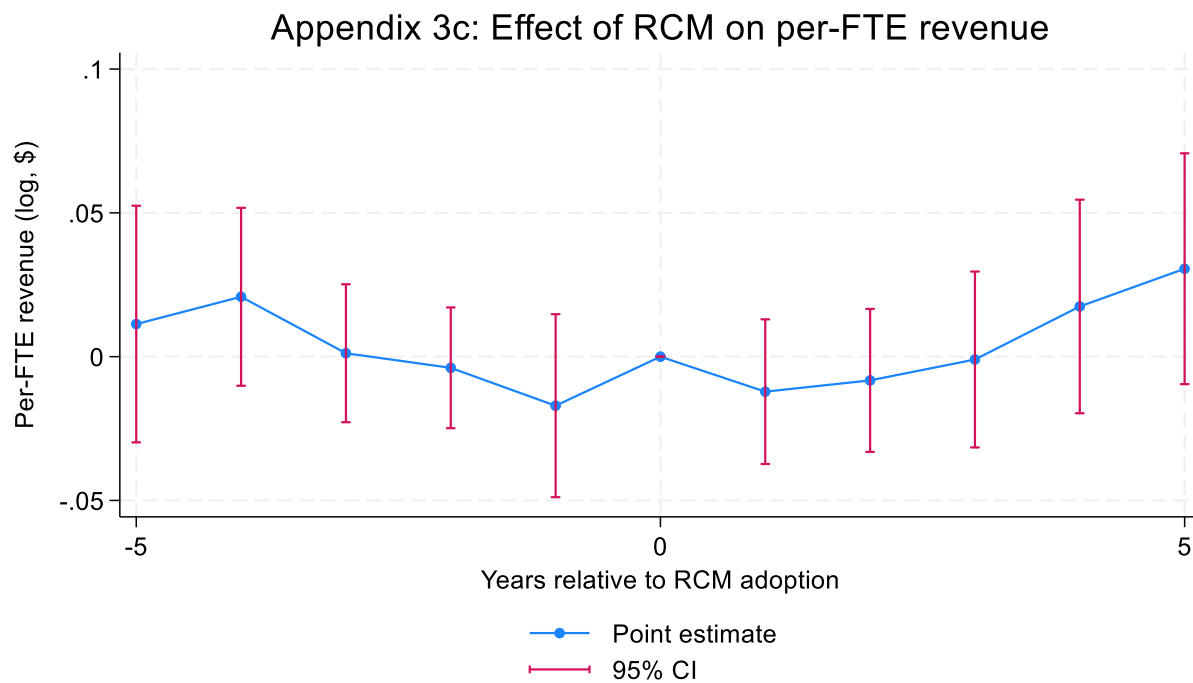
Sources: College Scorecard (debt and earnings data), authors' data collection (RCM), Rosinger et al. (2022) and author's data collection (PBF system), Kelchen & Pingel (2024) (tuition freeze), Bureau of Economic Analysis (state income/poverty), National Conference of State Legislatures (state partisan control, Integrated Postsecondary Education Data System (all others).

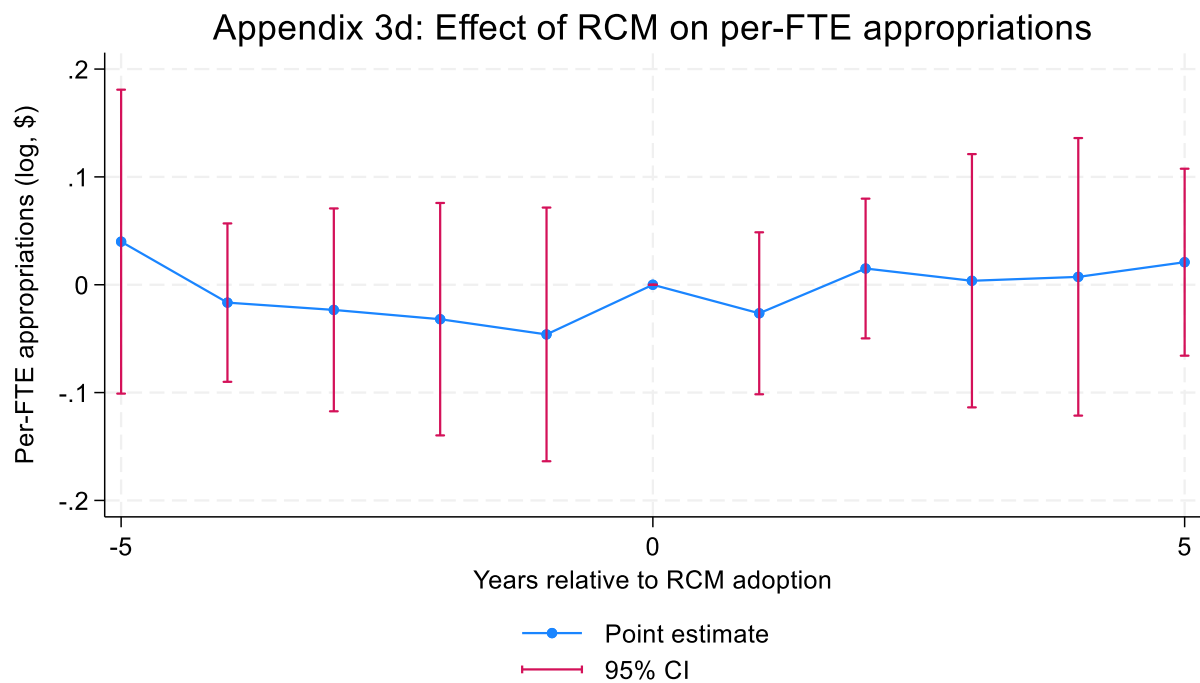
Notes:

(1) All financial values are adjusted for inflation into 2024 dollars using the Consumer Price Index.









Appendix 4: Event study estimates of the effects of RCM implementations and announcements on the number of master's programs and graduates.

Time period (t is reference)	Implementations		Announcements	
	Programs	Graduates (log)	Programs	Graduates (log)
t-5	0.58 (0.88)	-0.040 (0.029)	0.90 (0.75)	-0.010 (0.025)
t-4	-0.52 (0.61)	-0.052 (0.026)	0.99 (0.70)	-0.004 (0.026)
t-3	-0.73 (0.36)	-0.043 (0.016)	0.84 (0.58)	-0.070 (0.026)
t-2	-0.68 (0.28)	-0.027 (0.018)	0.67 (0.49)	-0.051 (0.018)
t-1	-0.29 (0.18)	-0.006 (0.019)	0.23 (0.46)	-0.030 (0.010)
t+1	-0.13 (0.25)	-0.026 (0.012)	-0.77 (0.30)	0.020 (0.012)
t+2	0.16 (0.70)	-0.025 (0.014)	-0.75 (0.51)	0.037 (0.015)
t+3	0.18 (0.68)	-0.041 (0.019)	-0.40 (0.43)	0.058 (0.022)
t+4	0.23 (0.86)	-0.011 (0.025)	-0.56 (0.55)	0.058 (0.026)
t+5	0.61 (0.99)	-0.006 (0.032)	-0.32 (0.65)	0.038 (0.023)
t+6	0.35 (1.14)	-0.026 (0.043)	-0.17 (0.66)	0.007 (0.030)
t+7	0.65 (1.14)	0.030 (0.046)	-0.10 (0.82)	0.041 (0.028)
t+8	0.02 (1.33)	0.024 (0.040)	-0.81 (0.89)	0.029 (0.037)
t+9	-0.05 (1.75)	-0.036 (0.046)	-0.91 (1.01)	0.031 (0.044)
t+10	-0.56 (2.31)	-0.022 (0.045)	-0.13 (1.27)	0.088 (0.049)
Total treatment effect	0.19 (0.79)	-0.019 (0.025)	-0.51 (0.50)	0.039 (0.018)
Number of observations	2,022	2,022	2,146	2,146
Max number of switchers	39	39	49	49

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Notes:

- (1) All regressions control for the coefficients found in Table 1, have institution and year fixed effects, use state-clustered standard errors, and are weighted using inverse probability treatment weights.
- (2) Financial values are logged and adjusted for inflation into 2024 dollars using the Consumer Price Index.
- (3) These were generated using the `did_multiplegt_dyn` command in Stata (de Chaisemartin & D'Haultfoeuille, 2025) that allows for multiple treatment spells and heterogeneity-robust estimates.