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LEVELING THE PLAYING FIELD: THE TAXPAYER RELIEF ACT OF 1997 AND TAX-EXEMPT BORROWING BY NONPROFIT COLLEGES AND UNIVERSITIES

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As part of the Tax Reform Act of 1986, non-hospital nonprofit organizations were subject to a $150 million cap on tax-exempt debt outstanding. This federally-imposed constraint was lifted by the Taxpayer Relief Act of 1997. This paper examines how this credibly exogenous policy change — which was little noticed outside of the municipal bond industry — reduced the cost of capital, and, as a result, led to a significant increase in the use of tax-exempt debt overall and relative to other financing sources by nonprofit colleges and universities. Using two different comparison groups and a difference-in-differences estimation strategy, we find that nonprofit colleges and universities significantly increased the use of tax-exempt borrowing and altered capital structures following the policy change in 1997 with some variation by degree of constraint.

Keywords: cost of capital, nonprofit higher education, tax-exempt debt

JEL Codes: H20, H54, L30

I. INTRODUCTION

In 1997, Congress passed and President Clinton signed legislation that lifted a cap on the amount of tax-exempt debt outstanding by nonprofit organizations that were not hospitals. The original cap was implemented as part of the Tax Reform Act of 1986 (TRA86) in response to the growing use of tax-exempt debt by higher education institutions that simultaneously owned significant endowment portfolios (Zimmerman, 2004). The TRA86 directly increased the cost of capital for nonprofit colleges and universities that were above or near the $150 million cap by removing tax-exempt debt issuance as a source of funds. Further, the TRA86 indirectly affected the cost of capital for other nonprofit colleges and universities because these institutions may have preserved tax-exempt borrowing capacity, relying instead upon a mix of tax-exempt and taxable

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borrowing or using accumulated equity funds as a result.[1] When the Taxpayer Relief Act of 1997 (TRA97) was signed into law, this federally-imposed constraint was lifted, and directly and indirectly reduced nonprofit colleges and universities' cost of capital.

We examine how this credibly exogenous policy change led to a significant increase in the use of tax-exempt debt (both in absolute terms and in relation to other financing sources) by private nonprofit colleges and universities. This increased access to less expensive tax-exempt debt was heralded as a means of leveling the playing field between private nonprofit colleges and universities and their public counterparts that already had unrestricted access to the tax-exempt bond market.

Using two comparison groups that were never bound by the limitations of the TRA86 — nonprofit hospitals and public universities — we find that the broad nonprofit higher education sector responded to the policy change, with tax-exempt debt increasing 8 percentage points relative to total borrowing following the change in the TRA97. In addition to the greater dependence on tax-exempt debt as a source of borrowing, private nonprofit higher education institutions also altered their capital structures, increasing tax-exempt debt relative to more expensive taxable debt and equity by approximately 15 percent. Private nonprofit colleges and universities also meaningfully increased tax-exempt borrowing in absolute terms following the policy change in 1997.

We also consider the responsiveness of only those nonprofit higher education institutions that had high enough existing levels of tax-exempt debt outstanding to be directly constrained by the cap. These colleges and universities did not experience the same growth as the broader nonprofit higher education sector in their share of borrowing that was tax-exempt or tax-exempt debt to total assets due to already high shares of tax-exempt borrowing prior to the cap removal and different capital structures resulting from higher asset growth following cap removal, respectively. The constrained organizations did also see substantial increases in tax-exempt borrowing of 22.5 and 20.8 percent in the nonprofit and higher education samples, respectively. Overall, therefore, the change in tax law increased participation and usage of the tax-exempt debt market by the nonprofit higher education sector in general and was not merely a reflection of renewed borrowing by those institutions constrained by the $150 million limit.

This paper contributes to our limited understanding of higher education debt financing, which is a common source of funds for capital investment. Recent scholarship focuses on the role of capital investments in student choice between universities — that is, on the demand side. For example, Jacob, McCall, and Stange (2013) find that students have heterogeneous preferences for consumption amenities, leading certain universities to provide increasing amounts of capital-intensive amenities. Here, we analyze how a shift in the cost of capital — a supply-side change — altered financing practices.

The next section of the paper briefly presents the objectives of higher education organizations, followed by a discussion of public subsidies related to the financing of private nonprofit higher education institutions. The third section describes how the

[1] In the nonprofit sector, equity is called "net assets."

TRA86 and the TRA97 affected the ability of nonprofit colleges and universities to use the tax-exempt debt market. The fourth section discusses the institutions affected by the policy change, and our empirical approach follows. We then discuss our data and variables before presenting results, including extensions and robustness checks before concluding.

II. OBJECTIVES OF INSTITUTIONS OF HIGHER EDUCATION AND THE ROLE OF CAPITAL INVESTMENTS

Higher education institutions can be modeled as pursuing a "two-good framework," where ancillary activities that generate surplus resources (such as licensing of names and products, among other activities) exist to advance mission goods and services such as teaching, basic research, and public service (Weisbrod, Ballou, and Asch, 2008).[2] Many enterprises pursued by colleges and universities are capital-intensive — classrooms, laboratories, equipment, libraries, dormitories, sports, and student centers, among others. Jacob, McCall, and Stange (2013) find that higher education amenities allow institutions to increase charges and attract more students — both of which increase revenues that can be funneled into mission services. As a result, these capital investments are also a significant driver of competition between schools. In fact, the seemingly contagious spread of higher education capital projects has been dubbed a number of nicknames, including the Edifice Complex, the Law of More, and Taj Mahal syndrome.[3] Importantly for our purposes, these long-lived capital investments are routinely (but not exclusively) financed with debt.

III. PUBLIC SUBSIDIES AND THE FINANCING OF HIGHER EDUCATION CAPITAL

Current tax policy significantly subsidizes the sources of funds colleges and universities routinely use for capital investment. Exempting nonprofit higher education institutions from corporate income taxes results in an estimated federal tax expenditure of nearly $5 billion annually (Warshawsky, 2014), which is justified as an equity subsidy to encourage the accumulation of nonprofits' retained earnings on a pretax basis (Hansmann, 1981). An additional supply-side equity subsidy is the exemption on charitable contributions to nonprofit colleges and universities, costing an estimated $5.6 billion in 2013 (Warshawsky, 2014). Nonprofit and public colleges and universities can issue

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[2] Weisbrod, Ballou, and Asch (2008) note that some activities, such as intercollegiate athletics, may be viewed as a revenue activity for some schools and a mission activity for others, based on their profitability. In addition to the two-good framework, others have identified the objective function of universities as the pursuit of excellence in chosen activities (Clotfelter, 1996; Ehrenberg, 2000), contribution to human capital (Hoxby, 2012), or even the nearly random preferences of decision-makers (Cohen, March, and Olsen, 1972).

[3] Martin, Andrew, "Building a Showcase Campus, Using an I.O.U.," *The New York Times*, December 14, 2014, http://www.nytimes.com/2012/12/14/business/colleges-debt-falls-on-students-after-construction-binges.html?pagewanted=all&_r=0.

tax-exempt bonds, which are characterized by interest payments that are excluded from investors' taxable income. This subsidy reduces the cost of capital for those who opt for tax-exempt debt financing and resulted in $3.4 billion in federal tax expenditures in 2013 (Warshawsky, 2014).

The decision to invest in capital by colleges and universities depends on the organization's cost of capital (that is, the supply of funds) and the demand for capital, measured by the marginal product of capital. Here, the cost of capital is assumed to be an increasing function, and the demand for capital is assumed to be a decreasing function.[4] Assuming that less costly tax-exempt borrowing can substitute for taxable borrowing as well as equity,[5] this particular public subsidy shifts the supply schedule for debt-financed capital to the right. The result is that colleges and universities are predicted to use equity less in capital investing, borrow more, and borrow at lower cost in the tax-exempt bond market.

IV. FEDERAL TAX POLICY AND THE USE OF TAX-EXEMPT DEBT

In the 1980s, policymakers worried that nonprofit colleges and universities with significant endowments were taking advantage of arbitrage opportunities by accessing federally subsidized tax-exempt debt. As part of the TRA86, the amount of tax-exempt debt outstanding was limited to $150 million per organization for non-hospital nonprofits, and the limit was not adjusted for inflation over time. Any new issuances in excess of this limit would necessarily be taxable debt, carrying with it a higher cost of capital.[6] Further, a minimum 95 percent of new tax-exempt debt proceeds had to be used for capital expenditures, so nonprofits could not directly refinance existing taxable debt outstanding to less expensive tax-exempt debt. Nonprofits over the cap could not issue new tax-exempt debt until their levels fell below $150 million.

It is in this context that the TRA97 removed the cap on tax-exempt debt outstanding for all nonprofits, but still required that most of the tax-exempt bond proceeds finance new capital assets. Public universities were unaffected by the policy change because they were never subject to a cap on tax-exempt borrowing. The repeal was considered an important element of leveling the playing field between public universities and private

[4] The slopes need not be strictly linear. Gentry (2002) points out that the supply function is segmented based on the amount of capital stock demanded because of an increasing risk premium on the debt.

[5] Because the tax-exempt borrowing rate is typically lower than the risk-free rate on Treasury bonds of similar duration, the cost of using equity will necessarily be greater than the cost of using tax-exempt debt.

[6] Over the sample period of 1993 to 2001, the interest rate spread between high-grade taxable corporate and tax-exempt municipal bonds averaged 1.68 percentage points (Council of Economic Advisors, 2013), ranging from 1.41 percentage points in 1998 to 1.89 in 2001. These spreads imply an average reduction in cost of capital from switching from taxable to tax-exempt borrowing of around 23 percent depending on the year of issuance (ranging from 21.3 to 26.7 percent). This is similar to the implied tax rate for the marginal municipal bond investor — that is, the rate of subsidy of capital due to tax exemption — found by Liu and Denison (2014).

nonprofit institutions, and was viewed as an indirect federal investment in higher education. Fifty nonprofit college and university presidents publicly supported the change in policy, citing a need for increased access to less costly borrowing (Resnick, 1998).

V. INSTITUTIONS AFFECTED BY THE POLICY CHANGE

Only a small percentage of nonprofit colleges and universities had tax-exempt debt outstanding in excess of or near the $150 million cap imposed by the TRA86. The implication is that few institutions had their cost of capital directly reduced by the policy change, yet we observe substantial increases in the use of tax-exempt debt throughout the nonprofit higher education sector following the TRA97. We believe that many more schools were affected, rather than only this small group.

Capital projects have significant lead times of up to several years and are lumpy, suggesting that nonprofit colleges and universities prior to 1997 might preserve their limited tax-exempt debt capacity for future projects. This is especially true if an institution already has a capital plan in place — its unused tax-exempt debt capacity might be internally encumbered or reserved for particular future projects. In this scenario, a college or university below the cap might finance large capital projects with a mix of tax-exempt and taxable debt (or even accumulated equity) to maintain some tax-exempt debt capacity for future usage. Massy (1996, p. 128) notes that this type of "internal policy parameter" preserves debt capacity to deal with potential future unknowns.

Once the TRA97 removed this cap, nonprofit colleges and universities no longer needed to ration tax-exempt debt or maintain unused capacity. Facing no legal limit on tax-exempt debt outstanding meant that the primary concern of nonprofit colleges and universities was whether they could afford to service the tax-exempt debt once issued, which was unambiguously cheaper than the taxable alternatives. Hence, even institutions with less than $150 million of tax-exempt debt outstanding would be expected to shift toward using an increasing amount of less expensive tax-exempt debt relative to taxable debt as well as equity. Bond rating agencies noted there was a significant drop in taxable debt issuance following the TRA97 as tax-exempt debt volume increased, and this behavior was not limited to those schools over the cap (Resnick, 1998).

We further expect the uncertainty of the long-term policy environment to contribute to wider usage of tax-exempt debt following the TRA97. Nonprofit colleges and universities experienced the capital constraints imposed by federal lawmakers on the entire industry only a decade before. When this cap was lifted, decision makers would rationally increase their overall usage of tax-exempt financing, knowing that federal lawmakers could again alter the policy and cap tax-exempt debt issuance in the future. As noted at the time, "people have become quite aware that their ability to issue tax-free bonds can be taken away, and they're trying to lock in this subsidy for the maximum period that they can" (Ward, 1999). As a result of this public policy uncertainty, we expect even those colleges and universities initially unconstrained by the TRA86 to alter borrowing behavior as a result of the policy change.

Tax-exempt bonds are more costly to issue than taxable bonds due to regulatory and compliance concerns. Robbins and Simonsen (2013) demonstrate that tax-exempt bonds in California have issuance costs roughly 20 percent greater than taxable bonds and find significant economies of scale. As such, the TRA86 cap on tax-exempt debt outstanding may have prevented colleges and universities near the cap from issuing tax-exempt bonds large enough to be cost-effective and still keep them beneath the limit. Based on our sample, the average tax-exempt bond issue for nonprofit colleges and universities was $24.3 million from 1993 to 2001. With the removal of the cap, colleges and universities could take better advantage of the scale economies of tax-exempt debt.

VI. EMPIRICAL APPROACH

We use a credibly exogenous change in federal tax policy (TRA97) to measure how nonprofit colleges and universities that experienced a shift in their cost of capital subsequently altered their use of tax-exempt debt, relative to comparable nonprofit hospitals and public colleges and universities that did not experience a similar shift. Specifically, we examine how the mix of taxable and tax-exempt borrowing, capital structure (tax-exempt debt relative to other borrowing and equity financing), and tax-exempt debt outstanding have changed for nonprofit higher education organizations in response to the reduced constraints on tax-exempt borrowing introduced in 1997.

The nature of the policy change establishes two promising counterfactuals for comparison. The first takes advantage of the differential treatment of nonprofit organizations prior to the repeal of the borrowing cap in 1997. Private, nonprofit hospitals were the one category of nonprofit organizations exempt from any limit on tax-exempt borrowing activity so, unlike nonprofit higher education institutions, nonprofit hospitals' experienced no change in cost of capital as a result of the 1997 policy change. These two subsectors comprised more than two-thirds of total tax-exempt borrowing by all nonprofits as of 2010 (Calabrese and Ely, 2015). Hospitals and higher education also have relatively sophisticated management practices and unique payment structures that differ from other nonprofit organizations. For example, both rely upon third-party payers for most payments rather than direct payment from customers, and both have significant differences between the prices set by the institutions and the charges paid by customers (that is, patients or students). Both subsectors have relatively high barriers to entry due to accreditation and legal regulations, and licensing requirements of key personnel (faculty, doctors, nurses, etc.) limit the available pool of workers. Nonprofit hospitals provide a nonprofit comparison group where credit market forces operate in a similar manner.

While hospitals are the most similar comparison group to colleges and universities within the nonprofit sector, a secondary and natural comparison group for nonprofit colleges and universities is their public counterparts. By looking across sectors, we benefit from a tighter coupling of mission, services, and market demand between nonprofit and public colleges and universities and can validate findings from the nonprofit comparison.

Public higher education has always benefited from open access to tax-exempt debt, restricted only by market forces and occasional state debt policies.

We utilize a difference-in-differences (DD) approach to test the change in the use of tax-exempt debt by nonprofit colleges and universities following the 1997 policy change. The DD approach uses longitudinal data to observe the behavior of each unit both before and after the policy change. The use of two separate comparison groups (nonprofit hospitals and public higher education) reduces concerns over a critical assumption of the DD approach, that of parallel trends. Observations prior to the removal of the cap are used to compare the similarity of group trends and placebo tests, where we assign the policy change to a different year prior to the actual policy change, provide support for the validity of the assumption, as well as addressing threats to internal validity (St. Clair and Cook, 2015).

The validity of the DD approach also depends on whether the treatment is exogenous. In this case, the treatment is the removal of the cap limiting tax-exempt debt outstanding that equalizes access to the tax-exempt debt market for nonprofit higher education institutions relative to the comparison groups (nonprofit hospitals and public higher education institutions). Substantial uncertainty surrounded the repeal of the cap. The bill was introduced on June 26, 1997 as part of the fast-tracked budget reconciliation process and signed into law less than six weeks later on August 5, 1997. The passage caught at least some universities in the process of issuing taxable debt by surprise (Strosnider, 1999), which would have been avoided if a timely repeal of the cap had been expected.

In our estimating equation (1), the coefficient of interest is represented by δ_1, which is the coefficient for the DD estimator,

$$(1) \quad Y_{it} = \beta_0 + \delta_0 post97_{it} + \beta_1 NPHEd_{it} + \delta_1 post97_{it} \times NPHEd_{it} + \upsilon_s + \omega_t + \mathrm{X}_{it} + \varepsilon_{it}.$$

The *post*97 variable is an indicator of whether the observation is before or after the enactment of the TRA97. *NPHEd* represents whether an organization is a nonprofit college or university (versus a nonprofit hospital or public higher education institution, depending on the sample). The DD estimator is the interaction of these two variables, and captures the effect of the change in the cost of capital for nonprofit colleges and universities compared to our two comparison groups.

We use a separate DD estimator in alternate specifications to test for heterogeneous effects of the policy change within the nonprofit higher education sector. Specifically, only nonprofit colleges and universities that were "constrained" by the TRA86 cap in the year prior to the policy change are represented in a constrained nonprofit higher education indicator. Interacting this with the post-policy change indicator changes the comparison groups in our samples to also include unconstrained nonprofit colleges and universities. A constrained nonprofit college or university is defined as having outstanding tax-exempt debt in 1996 that falls within the average tax-exempt bond issuance size plus one standard deviation from the cap based on the nonprofit higher education sample. This translates to having tax-exempt debt

outstanding in 1996 greater than $61.9 million including those institutions already exceeding the cap.[7]

Our primary dependent variable for the nonprofit sample is the share of tax-exempt borrowing (relative to total financial borrowing) for higher education institution or hospital *i* in year *t*. Financial liabilities for nonprofits are primarily bonds (tax-exempt or taxable), mortgages, and notes. This dependent variable directly addresses our research question about the movement toward using more tax-exempt debt following the repeal of the TRA97. Further, the substitution effect of the TRA97 is expected to result in nonprofit colleges and universities using relatively more tax-exempt debt to finance growing capital stock even if such growth comes from the demand-side; further, we expect fungibility and a transition towards increased tax-exempt debt even if net capital assets declined, despite the policy not permitting explicit refunding activity.

Although the policy change is expected to most directly influence tax-exempt debt activity, less restricted access to lower cost debt relative to equity is ultimately reflected in an organization's capital structure. The organization's tax-exempt debt to total assets ratio represents the dependence on tax-exempt debt relative to organizational resources, and is included as a second dependent variable to test how the choice to use tax-exempt debt or equity changed as a result of the TRA97. A positive and significant result would suggest that an increasing fraction of assets were financed by tax-exempt debt relative to other sources (equity and taxable borrowings). This dependent variable also is not biased by potential demand-side influences for reasons similar to those previously described. The capital structure measures the extent to which tax-exempt borrowing financed asset acquisition (both physical and financial assets), while our primary dependent variable (the ratio of tax-exempt debt to total debt) measures the importance of tax-exempt borrowing to all borrowings, which are distinct constructs.[8]

We also include the amount of tax-exempt debt outstanding as a final dependent variable for the nonprofit sample. This variable may potentially absorb demand-side influences if different levels of demand for capital existed between nonprofit hospitals and higher education organizations during the sample period and our control for organizational activity is imperfect. The level of tax-exempt debt outstanding dependent variable is retained since it is a straightforward measure of tax-exempt debt activity and can be easily contrasted with our secondary higher education sample results.

The vast majority of public college and university borrowing during the study period was tax-exempt (Kaiser, 1996), especially for capital purposes. The dependence on tax-exempt debt by public higher education allows us to use total borrowing for capital purposes by public colleges and universities as a proxy for tax-exempt borrowing in our comparison to nonprofit higher education institutions. For the higher education

[7] The definition of a constrained organization is based on a fixed point of outstanding debt prior to the TRA97. A more limited definition (within the average issuance size of the tax-exempt cap in 1996) yields substantively similar findings.

[8] For example, if a college increased assets because it generated a surplus, the capital structure measure would decline, but the share of borrowing that is tax-exempt would be unchanged.

sample, we follow Denison, Fowles, and Moody (2014) by scaling the variable by enrollment to present the relationship in per student terms. The secondary comparison group — public colleges and universities — operates in the same industry as nonprofit institutions of higher education, so demand-driven changes in debt activity are less of a concern than in the mixed nonprofit sample.

We also include year fixed effects (ω_t) to control for year-specific market characteristics that influence borrowing activity, such as prevailing interest rates and the spread between taxable and tax-exempt interest rates. Nonprofit organizations cannot directly access the tax-exempt debt market and, instead, depend on public authorities or general-purpose governments to serve as conduits. We include state fixed effects (v_s) to control for the possibility that support for such issuances varies consistently across states based on the availability of conduit issuers. ε_{it} is an idiosyncratic error term.

Finally, we include a vector of additional controls (X_{it}) for organizational characteristics that may be related to changes in borrowing levels. For the nonprofit sample, these covariates are a measure of service level activity in the form of total revenues and the variation in organizational activities using a revenue diversification measure.[9] The service level activity variables control for potential differences in demand across organizations and between the higher education and hospital nonprofit subsectors, a potential identification error. Increasing values of the revenue diversification index represent increasing revenue diversification. We also include an indicator for nonprofit colleges and universities that are combined with a hospital since they may have had different capital access capabilities prior to cap removal.

A benefit of the higher education sample is the availability of organization-level controls for the primary determinants of costs in colleges and universities. Although we do not present a formal cost function, we include student enrollment and Carnegie sector classifications (Research/Doctoral Institutions is the omitted category, while indicators of Master's and Bachelor's Institutions are included). We depend on the Carnegie classification to represent the range of higher education activities as multi-product firms. Studies of higher education cost functions generally find that costs vary directly with enrollment (Cohn, Rhine, and Santos, 1989; Dundar and Lewis, 1995), and with research activity (Robst, 2001). The share of total revenue provided by the state to public institutions for operations is included and, along with Carnegie classification, parallels the inclusion of a revenue diversity measure in the nonprofit sample. A per student revenue measure of service activity mirrors the nonprofit sample analyses by controlling for changing demand.[10] Competition among peer institutions is recognized using athletic conference fixed effects in a separate higher education sample specification.

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[9] Revenue diversification is defined as $D = \left(\sum_{i=1}^{4} R_i^2 \right) / 0.75$, where R_i is the proportion of revenue generated from government grants, donations, program revenue, and investments (Yan, Denison, and Butler, 2009).

[10] "Total current funds revenues" is a broad measure of core and non-core operations in the Integrated Post-secondary Education Data System.

VII. DATA

Data for the nonprofit sector sample come from the merger of the annual Statistics of Income (SOI) from the Internal Revenue Service (IRS) and the IRS Business Master File (BMF) for years 1993 to 2001. The SOI includes the Form 990 data for all large nonprofit organizations (those with $10 million in assets or more). The IRS began including tax-exempt debt liabilities beginning in 1993. The IRS files do not include descriptive information on the organizations, which are provided instead in the BMF.

The SOI data capture nearly all nonprofit higher education and hospital organizations. The organizations in the combined SOI-BMF data were limited to those nonprofits coded by the IRS as higher education (NTMAJ12 code "BH") or hospitals (code "EH"). The sample covers approximately equal periods of four-and-a-half years before and after the repeal of the cap in 1997. Substantial lead times are often required in capital planning and changes in the tax code may not be immediately reflected in tax-exempt borrowing and capital spending. However, the equal periods lead to less biased estimates of the TRA97's effect on nonprofit higher education institutions and smaller standard errors than a panel with unbalanced time periods before and after the policy change (Jung and Pirog, 2014).

After removing organizations with data errors, such as reporting negative expenses, the nonprofit domestic sample consists of 30,733 observations of hospitals and higher education institutions across the years 1993 to 2001. More than half of those observations (17,802) appear in the data annually over the period. Organizations with some missing observations include new organizations and mergers — especially in the hospital sector. Unbalanced observations are also an artifact of the SOI sampling strategy, with smaller organizations less frequently represented. We prefer the balanced panel since it reduces the likelihood that findings are due to anomalies in an organization's life cycle (such as the debt requirements for a new organization's initial capital build-out or changes in debt levels due to mergers). The analysis uses a slightly smaller number of balanced observations (17,730 versus 17,802) due to missing individual data fields. The final nonprofit sample includes 1,970 unique organizations with 17,730 annual observations — 5,787 higher education and 11,943 hospital observations. Using the full, unbalanced sample does not substantially affect our findings.

The public/nonprofit higher education sample was constructed by combining the nonprofit sector data described above with data including the outstanding principal debt levels of public colleges and universities from the Integrated Postsecondary Education Data System (IPEDS) collected by the National Center for Education Statistics.[11] The IPEDS data are the best available for public college and university financial information. We acknowledge that differences in state debt and capital funding policies regarding public higher education complicate the comparison to nonprofits and deserve greater

[11] Outstanding principal figures relate to debt for capital investment from the "Indebtedness on physical plant" files from 1993 to 1996, from the "Public 4-year and 2-year" data files for years 1997 to 1999, "Public institutions – F1" for year 2000, and the "Public institutions (GASB)" file for 2001.

attention, but survey data suggest that nearly 80 percent of states allow institutional or system-level discretion in public borrowing (Potter, 2006).

The higher education sample includes 21,100 observations over the 1993 to 2001 period. Omitting institutions with less directly relevant Carnegie codes (specifically Tribal Institutions, Specialized Institutions, and Associates Institutions) reduces the original 21,100 observations to 10,291. These reductions to the sample improve the comparability of institutions across the sectors since, for example, there are not many nonprofit two-year institutions. Additional deletions were made to balance the sample, with 7,749 observations of organizations represented in all study years, and to accommodate a small amount of missing data, primarily the debt outstanding variable. The final sample represents 861 colleges and universities (335 public and 526 nonprofit). Our presented findings are consistent when using the broader unbalanced sample.

Supporting information, including data on the education sector, state, enrollments, public share of revenues, and total revenues, comes from the Delta Cost Project Database and were merged with the IPEDS data. Athletic conference affiliations and divisions from the National Collegiate Athletic Association (NCAA) are merged with the IPEDS data and serve as our preferred grouping of institutions to control for peer competition in alternative specifications. Financial variables are adjusted for inflation with 2001 as the base year; total and tax-exempt borrowing values are adjusted for inflation using a construction cost inflation index, while other variables use the consumer price index in the nonprofit sample and the industry-specific Higher Education Price Index (HEPI) in the higher education sample. Tables 1 and 2 contain the descriptive statistics for the samples used in the nonprofit and higher education analyses, respectively.

VIII. RESULTS

Before presenting the regression results, we provide visual and descriptive evidence of the relationship between the cap removal and nonprofit higher education borrowing activity. Tax-exempt debt issuance became a more prominent source of capital for both nonprofit higher education and hospital organizations since the early 1990s, and is reflected in the share of borrowing that is tax-exempt. To test whether the pre policy-change trends were similar across the subsectors, an assumption of our methodology, we consider the trends in only years before the TRA97. As an example, Table 3 presents the simple DD analysis for the share of borrowing that is tax-exempt for the 1993 to 1996 period (prior to the TRA97) and suggests that the two group trends were not significantly different.[12] Following the TRA97, we see the share of tax-exempt debt in nonprofit higher education continue to rise (Figure 1) and the simple DD in Table 4 finds higher growth of the tax-exempt share of borrowing of approximately 8 percentage points by nonprofit colleges and universities following the TRA97.

[12] Identical tests of this basic parallel trends assumption hold for the remaining dependent variables in both the nonprofit and higher education samples using regression analysis.

Table 1

Summary Statistics for Nonprofit Organization Sample by Subsector (Hospital or Higher Education), 1993–2001

	Nonprofit Sample (Hospitals and Higher Education)			Nonprofit Hospitals			Nonprofit Higher Education		
	N	Mean	Standard Deviation	*N*	Mean	Standard Deviation	*N*	Mean	Standard Deviation
Tax-exempt share of borrowing (fraction)	17,730	0.45	0.47	11,943	0.46	0.48	5,787	0.44	0.46
Tax-exempt debt to total assets (fraction)	17,730	0.13	0.18	11,943	0.16	0.20	5,787	0.09	0.12
Tax-exempt bonds outstanding ($millions)	17,730	34.30	94.53	11,943	36.70	96.72	5,787	29.36	89.64
Post TRA97 (1,0)	17,730	0.49	0.47	11,943	0.49	0.47	5,787	0.49	0.47
Higher education (1,0)	17,730	0.33	0.47	11,943	–	–	5,787	1.00	0.00
Constrained higher education (1,0)	17,730	0.03	0.16	11,943	–	–	5,787	0.08	0.28
Higher education with hospital (1,0)	17,730	0.02	0.12	11,943	–	–	5,787	0.05	0.21
Total revenue ($millions)	17,730	142.56	270.70	11,943	150.78	227.20	5,787	125.59	342.88
Revenue diversification (fraction)	17,730	0.29	0.26	11,943	0.15	0.14	5,787	0.57	0.20

Note: All financial variables are inflation adjusted using the CCI or CPI.
Source: IRS SOI, multiple years

Table 2

Summary Statistics for Higher Education Institution Sample by Sector (Public or Nonprofit), 1993–2001

	Higher Education Sample (Nonprofit and Public)			Public Colleges and Universities			Nonprofit Colleges and Universities		
	N	Mean	Standard Deviation	*N*	Mean	Standard Deviation	*N*	Mean	Standard Deviation
Tax-exempt borrowing per student ($)	7,749	5,870	9,117	3,015	3,957	3,932	4,734	7,088	11,064
Post TRA97	7,749	0.49	0.47	3,015	0.49	0.47	4,734	0.49	0.47
Nonprofit college or university	7,749	0.61	0.49	3,015	–	–	4,734	1.00	–
Constrained nonprofit college or university	7,749	0.06	0.23	3,015	–	–	4,734	0.09	0.29
Total enrollment	7,749	7,437	10,213	3,015	13,484	13,426	4,734	3,585	4,223
Total revenue ($millions)	7,749	181	406	3,015	261	442	4,734	131	374
Public appropriation share (%)	7,749	15.15	19.90	3,015	38.93	9.60	4,734	0.00	0.00
Total revenue per student ($)	7,749	21,999	23,519	3,015	15,511	10,270	4,734	26,131	28,185
Research/doctoral institution	7,749	0.22	0.42	3,015	0.36	0.48	4,734	0.13	0.34
Master's institution	7,749	0.44	0.50	3,015	0.50	0.50	4,734	0.39	0.49
Bachelor's institution	7,749	0.34	0.47	3,015	0.13	0.34	4,734	0.47	0.50

Note: All financial variables are inflation adjusted using the CCI or HEPI.
Source: IRS SOI, multiple years and IPEDS, multiple years

Table 3

Pre-TRA97 Difference-in-Differences Analysis of Tax-exempt Share of Total Borrowing (Nonprofit Sample)

	Tax-Exempt Debt Share of Total Borrowing		
	Hospital (C)	Higher Education (T)	Difference (T-C)
4 years prior (1993)	0.34	0.28	(0.06)
1 year prior (1996)	0.46	0.41	(0.05)
Pre-cap repeal changes	0.12	0.14	0.01

Note: The difference-in-differences is not statistically significant when replicated using regression analysis.

Table 4

TRA97 Difference-in-Differences Analysis of Tax-exempt Share of Total Borrowing (Nonprofit Sample)

	Tax-Exempt Debt Share of Total Borrowing		
	Hospital (C)	Higher Education (T)	Difference (T-C)
Pre-cap repeal (1993–1997)	0.42	0.37	(0.05)
Post-cap repeal (1998–2001)	0.50	0.53	0.03
Post-cap repeal changes	0.09	0.16	0.08

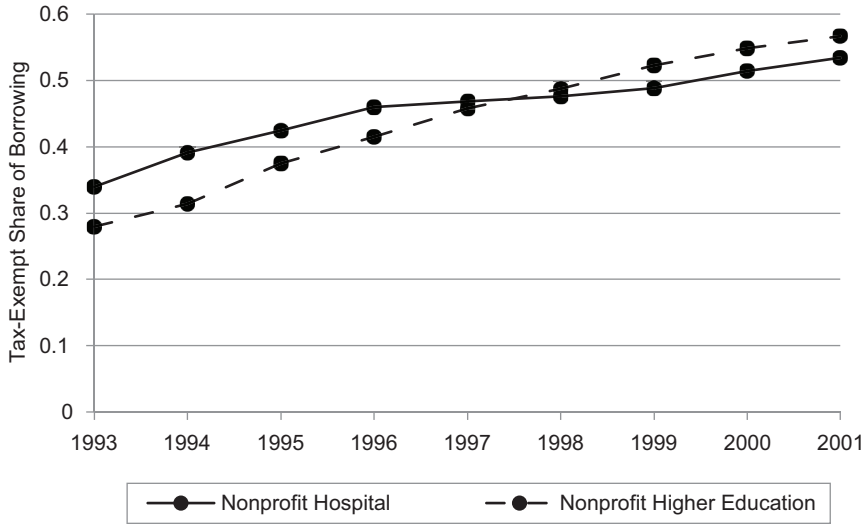
Note: The difference-in-differences is statistically significant when replicated using regression analysis.

The growth trend in total borrowing activity for public and nonprofit colleges and universities was similar on a per student basis prior to the TRA97. Visually, total real borrowing per student was fairly flat until 1997 when nonprofit borrowing increased markedly (Figure 2). As previous research has noted, public colleges and universities have larger amounts of average debt but smaller amounts on a per student basis due to differences in average enrollments (Denison, Fowles, and Moody, 2014). We have presented descriptive and visual evidence that the dependence on tax-exempt debt and growth in borrowing have grown faster for nonprofit higher education during this period than another major nonprofit sector, hospitals, and public higher education, respectively.

We first turn to the estimates using only the nonprofit sample. The DD estimates, representing the relationship between the dependent variable and the removal of the

Figure 1

Tax-Exempt Share of Total Borrowing, Nonprofit Sector, 1993–2001

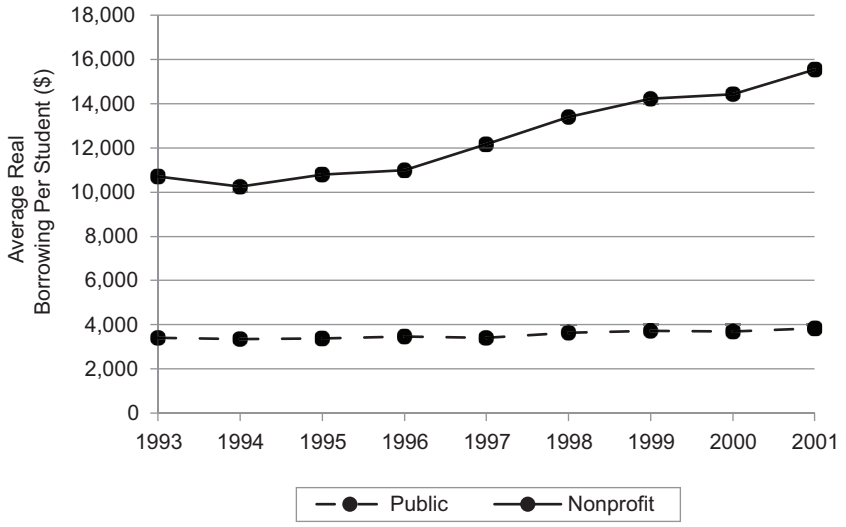


Source: IRS SOI, multiple years

tax-exempt debt cap for nonprofit colleges and universities, are positive and statistically significant for all three dependent variables (Row 3 of the results in Table 5). The estimates are also practically significant. The removal of the cap is associated with an increase in the tax-exempt share of total borrowing of 7.7 percentage points (Column 1 of Table 5). The capital structure of nonprofit colleges and universities also significantly shifted, increasing 1.0 percentage point or 15 percent relative to the 1996 mean, to a greater dependence on tax-exempt debt to finance assets following the TRA97 (Column 2 of Table 5). The removal of the cap is associated with an average $6.1 million increase in tax-exempt debt outstanding for nonprofit colleges and universities relative to nonprofit hospitals (see Column 3 in Table 5). Based on the sample's average tax-exempt debt outstanding for nonprofit colleges and universities this represents a 20.9 percent increase.

The nonprofit sample results differ in meaningful ways when focusing only on constrained higher education institutions. Evidence of increasing dependence on tax-exempt debt is not evident among this constrained group (see Column 4 of Table 5), suggesting a relatively large response from the unconstrained nonprofit higher education organizations. These constrained organizations were already heavily dependent on tax-exempt debt — with such debt representing an average 86 percent of total borrowing prior to

Figure 2
Average Real Borrowing Per Student by Higher Education Sector, 1993–2001



Source: IRS SOI, multiple years, and IPEDS, multiple years

the cap removal, limiting their ability to meaningfully increase tax-exempt borrowing dependence. The lack of a positive and statistically significant effect may also reflect restrictions within the TRA97 that an organization already exceeding the cap could not explicitly exchange existing taxable debt for tax-exempt debt.

Contrary to the overall findings, constrained nonprofit colleges and universities experienced a statistically significant decline in dependence on tax-exempt debt relative to assets (Column 5 of Table 5). These constrained nonprofit schools owned the majority of sector-wide endowments (defined as total net assets), and their endowments grew nearly 19 percent following the TRA97, compared to endowment growth of 3.5 percent for the unconstrained sample. As a result, equity growth during this period (1997– 2001) exceeded tax-exempt debt increases so the capital structure shifted towards more overall equity relative to assets. Finally the positive and statistically significant relationship between the cap removal and the amount of tax-exempt debt outstanding persists for constrained organizations (see Column 6 of Table 5), but is much larger in magnitude than for the broader sample of nonprofit colleges and universities. Despite the size of the constrained estimate, it represents a 22.5 percent average increase in tax-exempt debt outstanding based on the constrained sample mean compared to a 20.9 percent average change for the broader nonprofit higher education sector.

Table 5
Tax-Exempt Borrowing Results (Nonprofit Hospital/Higher Education Sample)

	(1) Tax-Exempt Borrowing Share (Fraction)	(2) Tax-Exempt Debt-to-Total Assets (Fraction)	(3) Tax-Exempt Debt Outstanding ($Millions)	(4) Tax-Exempt Borrowing Share (Fraction) - Constrained	(5) Tax-Exempt Debt-to-Total Assets (Fraction) - Constrained	(6) Tax-Exempt Debt Outstanding ($Millions) - Constrained
Post TRA97 (1,0)	0.049***	0.025***	14.088***	0.217***	0.057***	20.857***
	(0.011)	(0.004)	(2.185)	(0.011)	(0.005)	(2.228)
Nonprofit Higher Education (1,0)	–0.033	–0.043***	–24.109***	–	–	–
	(0.029)	(0.012)	(6.773)			
Post TRA97 × NP Higher Education (1,0)	0.077***	0.010**	6.125**	–	–	–
	(0.014)	(0.005)	(2.561)			
Constrained NP Higher Education (1,0)	–	–	–	0.285***	0.049***	28.410*
				(0.048)	(0.018)	(14.734)
Post TRA97 × Constrained NPHEd (1,0)	–	–	–	–0.005	–0.023***	49.876***
				(0.026)	(0.008)	(12.111)
Higher Education with Hospital (1,0)	–0.007	0.035	10.165	–0.086	0.009	–11.934
	(0.072)	(0.027)	(18.540)	(0.064)	(0.026)	(18.334)
Total Revenue ($)	0.000***	0.000**	0.215***	0.000***	0.000*	0.207***
	(0.000)	(0.000)	(0.012)	(0.000)	(0.000)	(0.012)
Revenue Diversification	–0.031	–0.074***	43.410***	–0.069**	–0.132***	7.305
	(0.047)	(0.019)	(12.586)	(0.033)	(0.011)	(4.611)
Constant	0.551***	0.178***	–8.865**	0.409***	0.148***	–13.731***
	(0.079)	(0.029)	(4.114)	(0.079)	(0.029)	(4.074)
Observations	17,730	17,730	17,730	17,730	17,730	17,730
R^2	0.111	0.109	0.425	0.116	0.106	0.427
Adjusted R^2	0.108	0.106	0.423	0.113	0.103	0.425

Notes: Cluster-robust standard errors are in parentheses (clustered by organization). State and year fixed effects are included but not reported. Constrained Nonprofit Higher Education includes organizations with outstanding tax-exempt debt greater than $61.9 million in 1996. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

Extending the analysis to our sample of public and private colleges and universities complements these results by using a comparison group from the same industry. As mentioned, we use the total debt outstanding for capital spending as a proxy for tax-exempt debt activity at public colleges and universities. Limited details on assets and the composition of debt at public colleges and universities means we cannot replicate the borrowing composition and capital structure measures used with the previous nonprofit analysis. The cap repeal is positively and statistically significantly related to increased levels of total tax-exempt borrowing per student for nonprofit colleges and universities relative to public higher education institutions. We find that the lower cost of capital following the TRA97 resulted in increased nonprofit tax-exempt borrowing per student of $3,695 (Column 1 in Table 6). The inclusion of athletic conference fixed effects results in a larger DD estimate, $4,322 per student, and better controls for the competition and relationship between peer institutions (Column 2 in Table 6). Focusing the analysis on only constrained nonprofit colleges and universities (Column 3 in Table 6) results in a consistent story about the responsiveness of tax-exempt borrowing to the policy change. As expected, the associated increase in tax-exempt borrowing on a per student basis for these constrained organizations is larger in absolute terms ($5,319) than for the sector as a whole, representing a 20.8 percent change based on the constrained sample mean.

Our discussion of the results has focused on the DD estimates. Here we briefly address the remaining findings. Total revenue (a control for potential demand differentials) is a positive correlate of borrowing levels across the samples and analyses, suggesting that organizations with increased demand for services and greater activity increase borrowing. Revenue diversification is positively related to increasing absolute amounts of tax-exempt borrowing; however, diversification is negatively related to the amount of tax-exempt borrowing relative to total assets and unrelated to the tax-exempt share of borrowing for the primary models.

IX. EXTENSIONS AND ROBUSTNESS CHECKS

The empirical results support the general expectation that nonprofit higher education institutions increased the use of tax-exempt debt following the TRA97, and that the changes were not limited solely to, or concentrated among, organizations directly constrained by the prior debt cap. The primary extensions further consider the organizational responsiveness to the cap removal and the timing of such responses.

We address the question of differential responsiveness to the TRA97 using the higher education sample and segment colleges and universities by Carnegie classification. This allows us to analyze how the TRA97 affected peer institutions, since we suspect that like institutions compete with each other and should similarly change their behavior (to attract students and remain competitive on costs, for example).[13] All three

[13] We do not use a fully interacted model since Carnegie classifications, as well as the NCAA divisions used later, are strongly correlated with nonprofit status, especially for institutions that grant bachelor's degrees.

Table 6

Tax-Exempt Borrowing Per Student Results (Higher Education Sample)

	(1) Tax-Exempt Borrowing Per Student ($)	(2) Tax-Exempt Borrowing Per Student ($)	(3) Tax-Exempt Borrowing Per Student ($) – Constrained
Post TRA97 (1,0)	3,161.5***	3,238.9***	5,507.3***
	(256.98)	(269.47)	(397.64)
Nonprofit Higher Education (1,0)	1,008.0	–1,586.4	–
	(1,306.2)	(1,555.2)	
Post TRA97 × Nonprofit Higher Education (1,0)	3,694.9***	4,322.1***	–
	(320.9)	(383.15)	
Constrained Nonprofit Higher Education (1,0)	–	–	10,081***
			(1,829.8)
Post TRA97 × Constrained Nonprofit Higher Education (1,0)	–	–	5,319.4***
			(1,371.3)
Total Revenue ($ per student)	0.18***	0.13***	0.10***
	(0.020)	(0.019)	(0.018)
Public Appropriation Revenue Share (%)	42.17	–12.60	11.87
	(29.125)	(33.209)	(15.373)
Total Enrollment	0.02	–0.01	–0.00
	(0.019)	(0.028)	(0.023)
Master's Institution (1,0)	–1,409.5**	–475.27	309.12
	(590.93)	(708.77)	(654.05)
Bachelor's Institution (1,0)	–890.68	357.04	1,451.6
	(778.86)	(968.71)	(883.09)
Constant	–554.52	170.99	–1,309.3
	(1,429.2)	(3,075.7)	(2,069.5)
Observations	7,749	6,588	6,588
R^2	0.39	0.49	0.53
Adjusted R^2	0.38	0.48	0.51
Athletic Conference Fixed Effects	No	Yes	Yes

Notes: Cluster-robust standard errors in parentheses (clustered by organization). State and year fixed effects are included but not reported. Constrained Nonprofit Higher Education includes organizations with outstanding tax-exempt debt greater than $61.9 million in 1996. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

institution types responded to the policy change (Table 7). To capture another measure of the similarity of higher education institutions, we group public and nonprofit institutions by their NCAA Division in unreported specifications. Nonprofit institutions in all three major NCAA Divisions also responded positively and statistically significantly to the cap removal. Both sets of groupings show a broad-based response to cap removal.

Borrowing and capital investment activity is inherently lumpy for all but the largest organizations. A change in the cost of capital may take time to be incorporated into organizations' long-term capital investment plans. Our analysis estimates an average effect of the policy change, but we also estimate the model with a DD estimator for each of the post-cap removal years to discern whether there was a lag in responsiveness. In the nonprofit sample, the tax-exempt share of total borrowing responds significantly to the policy change in the year of the cap removal and in each following year. The tax-exempt debt to total assets ratio (the capital structure measure) is statistically significantly related to cap removal for nonprofit higher education, beginning the year after cap removal in 1998 and continuing in 1999 before weakening in statistical significance and magnitude in years 2000 and 2001. This pattern reflects equity growth that far exceeded debt growth during this period and is similar to the pattern noted earlier for constrained schools. The statistically significant positive response of tax-exempt bonds outstanding is lagged two years following the cap removal beginning in 2000 and continuing in 2001. This is consistent with expectations that smaller issuers moving to the tax-exempt market rapidly altered their overall capital structure to reduce their cost of capital, but it took time for larger tax-exempt borrowings to move through the capital planning process and be reflected in overall debt portfolios. Analysis of the higher education sample finds the increases in tax-exempt debt per student in nonprofit higher education are statistically significant beginning in 1998 and remain so through 2001.

Primary threats to internal validity include possible challenges to our identification strategy and functional form. A placebo test complements the existing evidence presented on whether the parallel trends assumption holds. Given the limited number of pre-adoption and post-adoption years in our sample, the use of stock measures of debt as dependent variables, and the lengthy capital planning and debt issuance processes, we reassign the cap removal to the beginning of 1995 (rather than to 1997) so there are two years of both pre-adoption and post-adoption observations. The different pre-adoption year results in no statistically significant relationships between the artificial policy change and the borrowing outcomes we consider.

The DD approach also assumes that no additional events impact the nonprofit higher education sector differently than the comparison groups at the time the cap was removed. The inclusion of year fixed effects may not capture annual conditions that differ between nonprofit higher education and the respective comparison group. For example, the fundraising environment was favorable during the period following cap removal as equity markets boomed. Although we suspect the fundraising environment caused by general economic conditions is fairly uniform across sectors (public and nonprofit higher education) and subsectors (nonprofit hospitals and higher education), we separately include

Table 7

Borrowing Per Student Difference-in-Differences Estimates by Carnegie Classification

	(1)	(2)	(3)
	Research/Doctoral Institutions	Master's Institutions	Bachelor's Institutions
Post TRA97 (1,0)	4,242.1***	1,648.8***	–3,415.5***
	(667.43)	(244.52)	(461.11)
Nonprofit Higher Education (1,0)	3,8576.0	–131.70	–552.46
	(3,046.3)	(1,690.2)	(1,866.1)
Post TRA97 × Nonprofit Higher Education (1,0)	6,847.9***	2,902.5***	1,218.2***
	(1,342.4)	(356.31)	(427.45)
Total Revenue ($ per student)	0.13***	0.21***	0.12***
	(0.023)	(0.061)	(0.015)
Public Appropriation Revenue Share (%)	26.20	4.79	0.93
	(65.543)	(34.778)	(41.883)
Total Enrollment	0.03	0.14**	0.33*
	(0.023)	(0.053)	(0.173)
Constant	–273.05	–1,190.91	603.28
	(2,923.3)	(2,050.5)	(1,951.0)
Observations	1,719	3,384	4,561
R^2	0.54	0.23	0.24
Adjusted R^2	0.52	0.22	0.23

Notes: Cluster-robust standard errors in parentheses (by organization). State and year fixed effects are included but not reported. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

a measure of private contributions in the nonprofit sample analysis and find that it has no statistically significant relationship with an organization's tax-exempt debt levels.

Another concern is that increased nonprofit tax-exempt borrowing following the cap removal simply reflects long-term demographic trends during the period. We note that these trends, in addition to being prevalent for both comparison groups, are controlled for with the inclusion of organizational revenues as a measure of activity in all analyses and enrollment in the analysis using the higher education sample. Decisions related to model specification may also influence our findings. In unreported specifications we

interact all of the included independent variables with the nonprofit higher education indicator to allow for different slope estimates across the organization types. The findings are robust and conservative in magnitude to such inclusions.

X. CONCLUSIONS

We examine how a reduction in the cost of capital resulting from a change in the tax code in 1997 significantly increased the use of tax-exempt borrowing in the nonprofit higher education industry. Further empirical analysis shows that this reduction in the cost of capital broadly affected nonprofit colleges and universities, not just those above or near the cap. Our sector-wide analysis indicates the share of tax-exempt debt in total borrowing increased nearly 8 percentage points following the TRA97 change compared to nonprofit hospitals. Further, the policy change altered the average capital structure of nonprofit colleges and universities, with tax-exempt debt relative to assets increasing 15 percent — implying less taxable debt and equity were used to finance asset acquisition as institutions relied more on tax-exempt borrowing instead. These results for constrained nonprofit colleges and universities differ from the broader sector due to already high shares of tax-exempt borrowing prior to the cap removal and different capital structures resulting from higher asset growth following cap removal. We also find that private nonprofit colleges and universities increased their tax-exempt debt outstanding by substantial amounts when compared to nonprofit hospitals and public universities, respectively. On a per student basis, nonprofit colleges and universities saw tax-exempt borrowing increase between $3,695 and $4,322 per student compared to public colleges and universities following the TRA97. The constrained results across the two samples support the broader findings of increased average tax-exempt debt levels. Specifically, the constrained organizations experienced increases in tax-exempt debt of 22.5 percent and 20.8 percent in the nonprofit and higher education samples, respectively. Finally, our analyses find that all types of nonprofit colleges and universities (based on Carnegie classification) issued greater amounts of tax-exempt debt following the TRA97 policy change, but elite research institutions borrowed more.

Although we focus on tax-exempt borrowing as a stock concept (which is especially relevant for looking at borrowing composition and capital structure), future work may benefit from looking at annual borrowing activity or individual bond issuances when more granular data are accessible. Future research should also analyze whether increased access to tax-exempt debt led to increased investments in capital assets, or whether higher education used the bond proceeds as a form of indirect arbitrage and invested in more financial assets such as endowment. The increased use of tax-exempt debt freed up equity that nonprofit colleges and universities might have invested in capital assets before the policy change. Because of constraints (legal and operational) on withdrawals from endowments — as noted by Massy (1996) — such equity may have become available for investment in financial assets instead. Analyzing the use of tax-exempt

debt proceeds and verifying the permanence of these changes in tax-exempt debt use are logical next steps to understand how the TRA97 altered higher education's capital markets and structure. It is especially vital because endowments are a sign of reputation in higher education in ways unique to this industry alone.

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