“Separation in the Municipal Debt Market: Evidence from GASB 34”

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Separation in the Municipal Debt Market: Evidence from GASB 34

Abstract:
Governmental Accounting Standards Board (GASB) Statement No. 34 (GASB 34), issued in 1999 with implementation beginning in 2002, comprehensively changed financial accounting and disclosure practices of US state and local governments. We posit that GASB 34 addressed a collective action problem in municipal debt markets, which prevented issuers from credibly communicating financial quality. We consider whether governments responded to GASB 34 by: (1) modifying the issuance of public debt; (2) shifting new public debt issuances among affiliated government units; and (3) delaying or accelerating debt issuances in anticipation of GASB 34 implementation. Because GASB 34 can affect governments differentially, we employ methods designed to investigate changes in higher moments of distributions of new debt characteristics. Results are consistent with the notion that GASB 34 encourages separation in public municipal debt markets on the financial quality dimension.
1. Introduction

The Financial Accounting Foundation created the Governmental Accounting Standards Board (GASB) in 1984 to establish generally accepted accounting principles for US state and local governments. Of the 90 statements that the GASB has issued since its inception, the most substantial is GASB Statement No. 34 (hereafter, GASB 34). Issued in June 1999 and implemented beginning 2002, GASB 34 is remarkably comprehensive and touches all facets of financial disclosure by state and local governments. The standard requires governments to issue annual reports that include consolidated accrual basis financial statements, presentation of management discussion and analysis, and specific supplementary information. The impact of GASB 34 was, and still is, controversial.¹ We investigate changes in state and local government public debt characteristics surrounding GASB 34 implementation.

Prior to GASB 34, financial reporting by US state and local governments varied substantially. States typically regulated the financial reporting practices of composite governments (i.e., all governmental units located within a state) without guidance provided by a comprehensive and generally accepted financial reporting model. We characterize this pre-GASB 34 period as a pooling equilibrium where financial reporting was complex and opaque, and governments disclosed financial information selectively. As a result, prospective investors were not well informed and comparative assessments of the financial viability and accountability of governmental units were difficult (Zimmerman 1977).

We argue that GASB 34 provides a comprehensive and auditable reporting model that facilitates credible comparisons of state and local government financial information. Although states continue to impose accounting standards on composite governments² following GASB 34, we posit that the new standard encourages convergence of state and local government accounting and disclosure practices by

¹ As summarized by Foltin (2010), “‘Controversial’ only begins to describe the debate that transpired for 2 ½ years regarding [GASB 34]. With over 400 comment letters and several hearings, Statement 34 remains the most highly commented upon and deliberated statement in GASB’s history,” (24). The GASB is, in fact, currently reexamining GASB 34 and deliberating modifications and improvements to the standard (GASB 2018).
² We use the term “composite governments” to describe the governmental units, including subordinate units, that comprise a given level of government. For example, composite governments within a state include all general and special purpose state and local governments within state boundaries.
increasing the specificity of generally accepted standards. Such convergence engenders comparability among municipal debt issues, which better enables prospective investors to evaluate and sort governments according to financial viability. This characterization suggests separation in municipal debt markets such that investors are better able to distinguish high-quality from low-quality governments.\footnote{In support of this point, public testimony by a State Farm Insurance Company representative during the GASB 34 deliberation process notes “…traditionally the market has subsidized weaker borrowers through poor disclosure and penalized better borrowers…basically because there is not a see through type of situation available now through the financial statements” (Reardon 1997).} We use the term \textit{separation effects} to describe movement from a pooling to a separating equilibrium following GASB 34. We expect three potential consequences from post-GASB 34 separation effects.

First, governments have incentives to adjust public debt issuances according to newly informed lender assessments. If GASB 34 promotes separation, then low-financial quality governments decrease (and high-quality governments increase) their use of public debt financing post-GASB 34. We use the term \textit{new debt effects} to describe this expected change in municipal debt issuances.

Second, debt issuances can be shifted amongst composite governments to minimize debt service costs to the consolidated entity. For example, if a local government within the state is revealed to be low-quality, then the collective interests of the state may be served by issuing debt through a higher-quality governmental unit and then transferring the issuance proceeds to the low-quality local government.\footnote{Walsh (2012), Shafroth (2013), and Goodman and Leland (2018) document how state and local governments shift debt burdens from general government units to authorities that administer specific public services. Baird (2017) describes Alaska’s recent proposal to shift debt issuances earmarked for education from the state government to local school districts.} We refer to this type of behavior as \textit{debt shifting effects}, and consider debt shifting between state and local governments, general and special district governments, and general obligation and revenue debt.

Third, GASB 34 was issued in June 1999, with adoption required for large governments for fiscal years ending after June 15, 2002. Thus, governments were able to strategically manage debt issuances at least two years prior to being required to disclose GASB 34 information. We exploit this feature of GASB 34 to consider whether governments issue public debt strategically in anticipation of the standard’s effective date. At the margin, governments that anticipate favorable (adverse) consequences from GASB...
34 have incentives to delay (accelerate) debt issues until after (prior to) the GASB 34 implementation date. We introduce the term **anticipatory effects** to describe the consequences of such behavior.

A distinguishing feature of our empirical analyses is that we consider states to be autonomous, consolidated entities with the ability and responsibility to establish, regulate, and monitor the financial reporting policies of composite governments within the state, and oversee and regulate their public debt issues. Moreover, state governments are often *de facto* (if not *de jure*) guarantors for debt issued by composite governmental units.⁵ Thus, for each of the 50 states, we aggregate all debt issuances by state and local governmental units within a state-quarter. This unit of analysis contrasts with prior municipal accounting studies that consider state governments, local governments, or special districts without allowing for interaction or cooperation among composite units.

We focus on changes in five debt characteristics following GASB 34 implementation. To consider new debt effects, we investigate whether governments issue more or less new public debt per capita, and whether more or fewer composite governments issue public debt, post-GASB 34. To examine debt shifting effects, we investigate changes in the fraction of new debt issued by state (versus local) governments, by general (versus special district) government units, and as general obligation (versus revenue) debt. We investigate distributions constructed according to whether states systematically delay public debt issuances to after, or accelerate debt issues to before, GASB 34 implementation.

We acknowledge two features of the institutional setting that potentially limit our ability to detect and causally attribute treatment effects. First, we lack an easily-identifiable event window for GASB 34 implementation. Financial data availability and accounting standards enforcement are uneven and inconsistent in the governmental sector (particularly during the period surrounding GASB 34 implementation). Identifying and isolating short event windows when GASB 34 information is first revealed is impractical for large samples without extensive hand-collection. Thus, we provide before versus after comparisons of new debt characteristics after excluding a two-year GASB 34 transition

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⁵ To illustrate, consider recent instances in Rhode Island and California where state governments assumed liability for local government debt obligations (Huh et al. 2016).
period (calendar years 2002 and 2003). Second, we lack easily-identifiable counterfactuals for benchmarking treatment effects, as GASB 34 altered the disclosure environment for all US state and local governments. We take a multi-faceted approach to mitigate the consequences of these challenges, both building on prior research and introducing unconventional measures and analytical approaches. However, difficulties identifying and attributing causality remain.

We begin the empirical analysis by estimating regression specifications designed to compare new debt characteristics pre- versus post-GASB 34. The results of these specifications primarily attribute changes in new debt characteristics to temporal trends that encompass the GASB 34 implementation period. We next consider separation using cross-sectional partitions based on state-level characteristics that prior literature suggests are associated with disclosure and/or access to the municipal debt market, and thus could relate to the consequences of GASB 34 implementation. In particular, we distinguish the states according to the extent the state government (1) imposes the use of GAAP accounting on composite units; (2) provides financial oversight and governance of composite units; and (3) is politically stable. These comparisons do not provide convincing evidence of separation in the municipal debt markets post-GASB 34. A potential explanation is that GASB 34 consequences offset among high- and low-quality governments within these state-level characteristics to the point where regression specifications, which focus on changes in mean measures, do not detect them.

Thus, we go beyond mean comparisons to investigate higher moments of the distributions for these five debt characteristics. Using non-parametric methods, we compare pre- versus post-GASB 34 distributions of debt issuance characteristics after extracting state fixed effects and time fixed effects. These comparisons reveal statistically significant changes in distributions of new debt characteristics following the GASB 34 implementation period. We advance these results as evidence of separation in the municipal debt markets surrounding GASB 34.

To consider anticipatory effects, we conjecture that some governments have incentives to delay debt issuances prior to or to accelerate debt issuances to after GASB 34 implementation. Thus, governments reveal private assessments of their financial quality through strategic decisions to issue
public debt. Consistent with this perspective, we find that a greater than expected number of states increase debt issuances the year before and reduce debt issuances the year following the GASB 34 implementation period. We refer to these states as “accelerators.” Conversely, we also find that a greater than expected number of states exhibit the opposite behavior; we refer to these states as “delayers.” We interpret this result as evidence consistent with a characterization where governments anticipate GASB 34 consequences and respond strategically.

With these findings, we return to a regression approach to document separation. More specifically, we estimate regression specifications of pre- versus post-GASB 34 new debt characteristics that distinguish delayers (presumed to be high-quality issuers) and accelerators (presumed to be low-quality issuers). Consistent with the proposition that GASB 34 promotes separation in debt markets, we find that following the GASB 34 adoption period, delayers are more likely to issue new debt and access the public debt markets through general government entities than through special districts.

This study makes the following contributions to the government accounting literature. First, we substantially expand the body of existing studies that document the relevance of GASB 34 in municipal debt markets. Notably, we are the first to examine characteristics of municipal debt issues before versus after GASB 34 implementation. Prior studies specifically compare accrual versus fund-based measures following GASB 34 implementation to focus on how municipal bond investors value alternative GASB 34 disclosures – e.g., accrual accounting financial statements. Because governmental accounting data is not readily available for large samples,6 these studies necessary employ relatively small samples culled from a single sector, state, or type of municipal bond that have implemented GASB 34.7 The approach

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6 Studies that examine governmental accounting as reported under GASB standards generally utilize either hand-collected samples or limited data for subsets of governments provided by certain states or by the Government Finance Officer’s Association.

7 As examples, two early studies examine accrual-based performance measures for samples of Texas school districts (Plummer et al. 2007) and municipalities (Benson and Marks 2014). Other studies investigate general obligation debt for approximately 35 states where general obligation bonds are issued and ratings are available (e.g., Kioko et al. 2013; Johnson et al. 2012), while others examine relatively small samples of US cities (e.g., Pridgen and Wilder 2013; Reck and Wilson 2014).
advanced in this study is more comprehensive, utilizing much larger samples and alternative empirical measures to document GASB 34 consequences.

Second, we investigate state and local government responses to accounting standards implementation on dimensions heretofore unexplored. We posit, and document evidence of, separation in municipal debt markets following GASB 34. We conjecture that GASB 34 provisions, considered in their entirety, improved comparability among government units. We also specifically examine how issuers (rather than strictly investors) respond to new GASB 34 information. These responses include modifying the use of public debt and/or shifting debt burdens following GASB 34 and/or in anticipation of the consequences of GASB 34 disclosures. Prior literature considers neither shifting nor anticipatory effects.

Third, in addition to linear specifications designed to document mean effects, we employ methods not typically used in the prior literature that consider higher moments of the distributions. This approach reveals evidence of separation in municipal debt markets – a finding that is potentially obscured by analyses restricted to distribution means.

Fourth, we execute the analyses using debt issues consolidated to the state level, whereas prior studies focus on debt issues severally or aggregated at the level of individual governmental units. This approach acknowledges states’ abilities and incentives to monitor, regulate, and even guarantee, the use of public debt financing by governmental units located within the state. Moreover, the approach facilitates investigations of debt shifting among affiliated governments, which is alleged in the media (e.g., Malanga 2013; Griffith et al. 2016; Baird 2017).

Finally, we offer policy-relevant insights regarding how governments respond to GASB 34. The GASB is revisiting GASB 34 with the objective of “enhancing the effectiveness of the [GASB 34 reporting] model in providing information that is essential for decision-making” (GASB 2018). The results inform these deliberations by providing evidence that supports a characterization where GASB 34 facilitates separating equilibria in municipal debt markets. To be clear, our objective is not to contradict results obtained using approaches that employ traditional methods or that use data aggregated at other
than the state level. Rather, the objective is to bring alternative, not necessarily mutually exclusive, conceptual and empirical perspectives to the issues.

2. Institutional Details and Hypothesis Development

We posit that governments vary cross-sectionally in terms of underlying financial characteristics that engender responsible debt service. To ease the presentation, governmental entities that score high on relevant financial dimensions are designated “high-quality” governments; governments low on these dimensions are designated “low-quality” governments.

We assume that distinguishing financial quality – that is, evaluating creditworthiness – in part involves comparisons of financial information. We assume further that prospective lenders (i.e., investors in publicly-traded municipal debt) understand that municipalities have incentives to select and modify financial accounting and reporting practices opportunistically. That is, lenders are rationally skeptical about whether self-reported information fairly presents the borrower’s underlying financial viability.

2.1 The Financial Reporting Environment pre-GASB Statement No. 34

Prior to GASB 34, the US state and local government financial reporting environment was characterized by a lack of consensus regarding how governments should report financial information publicly. Annual financial reports for governments (called CAFRs, Comprehensive Annual Financial Reports) distinguish governmental activity from enterprise (i.e., business-like) activity. Prior to GASB 34, governmental activities (i.e., collecting taxes and providing core services like public safety) were reported using fund accounting, while enterprise activities (e.g., user fees charged to support the cost of public services) were reported using accrual accounting. Fund accounting is a modified cash basis of accounting that primarily focuses on increases and decreases in financial resources during the current period. The purpose of fund accounting is to facilitate fiscal accountability by comparing short-term budgets

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8 Consistent with this perspective, one GASB comment letter writer notes “[f]inancial analysis is based largely on comparisons….we believe the GASB’s proposed standard will have a notable and salutatory effect on the comparative quality of the financial data reported by state and local governments” (Nelson 1997, p.2).
(organized by “funds” with designated purposes) to actual results (GASB 1999). In contrast, accrual accounting – the reporting system used by publicly traded US companies – recognizes revenues and expenses as incurred, regardless of when cash is exchanged.

State and local governments established practices and standards for identifying and delineating fund types for external reporting. Over time, as external reporting practices independently evolved, reporting variation developed among governmental entities between, and within, states. As examples, some governments disclosed actual versus budgeted comparisons, and specific entities and activities included in CAFRs varied considerably across governments (GASB 1999). Lacking a standard financial reporting platform, governments were unable to credibly communicate their financial quality, auditors had no generally accepted basis for formulating opinions about whether accounts “present fairly, in all material respects, [a government’s] financial position” (AICPA 1995), and prospective lenders were unable to distinguish high-quality from low-quality governments (Zimmerman 1977).

High-quality governments potentially benefitted from a common financial reporting model that facilitated meaningful comparisons. Frictions in the market financial reporting market – for example, long-standing statutory-imposed accounting requirements perhaps buttressed by political resistance from low-quality governments or from coalitions that benefitted from the status quo – increased the costs of acting alone to create common reporting standards. Thus, although some governments might have individually benefitted from financial reporting improvements, they faced a collective action problem where individual governments lacked incentives to provide meaningful disclosure voluntarily.

2.2 GASB 34

GASB 34 was issued in June 1999, with effective adoption required for large governments for fiscal years ending after June 15, 2002 (GASB 1999). Among other provisions, the standard requires state and local governments to prepare “government-wide financial statements” using accrual accounting. Recall that prior to GASB 34, accrual accounting was not used to report governmental activities; therefore, general governments recognized sizable long-term assets (e.g., infrastructure and government buildings) and liabilities (e.g., pensions, OPEBs, and compensated absences) for the first time. GASB 34
further requires reporting of the more familiar fund accounting information, but with comparisons of actual fund revenues and expenditures with originally approved and subsequently-revised budgets; prescribes component units (e.g., affiliated special purpose governments) to be included in consolidated financial statements; and requires supplementary disclosures, such as a management discussion and analysis, infrastructure and debt details, and historical macro-economic and demographic data. These new provisions are substantial and material changes to governmental accounting.9

We argue that, relative to the pre-GASB 34 reporting environment, GASB 34 provides a more comprehensive platform for comparing state and local government financial information, discourages obfuscation resulting from “off-balance-sheet” transactions, and promotes assurance and financial discipline in the municipal sector (Johnson et al. 2012). Perhaps equally significant, GASB 34 also provides a common and accepted basis for independent audit and certification, thus improving the consistency and comparability of audited financial statements prepared in accordance with GAAP. Thus, we conjecture that GASB 34 represents a significant step toward addressing the collective action problem faced by US state and local governments with respect to financial reporting.

2.3 Potential GASB 34 Consequences in Municipal Debt Markets

We posit that GASB 34 financial information facilitates within-sector comparisons among governments, such that the benefits of standardized financial reporting vary directly with issuer creditworthiness.10 To illustrate, consider two kinds of municipalities: one more financially sound than the second. Because investor assessments involve comparisons and municipalities could chose financial reporting and disclosure practices opportunistically, a financially sound municipality lacked a credible and low-cost way to convey its financial position to potential investors pre-GASB 34, resulting in a

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9 GASB Chairman Tom Allen noted that GASB 34 “… is the most significant change in the history of government financial reporting. Never before has the public been able to get a comprehensive overview of a state or local government’s finances in one place” (Chase 2000).

10 Point made, one must allow for the possibility that GASB 34 information increases the cost of municipal financing in the aggregate. Such increases may occur, as examples, either through obfuscation – i.e., GASB No. 34 reporting is overly complex – or by discouraging idiosyncratic discretionary accounting practices permitted pre-GASB 34 that convey useful entity-specific information (Healy and Wahlen 1999, p.366).
pooling equilibrium. Post-GASB 34, financial reporting, disclosure standardization, and comparability increased, and the ability to report opportunistically decreased. Because investors are better able to distinguish financial quality (creditworthiness), the marginal cost of debt for the high- (low-) quality issuer decreases (increases). Thus, a separating equilibrium – which allows high-quality governments to credibly signal their higher quality – results in high-quality governments benefiting more from GASB 34 disclosures (relative to low-quality governments). *Ceteris paribus*, if GASB 34 benefits to high-quality governments offset adverse consequences to low-quality governments, then aggregate mean debt costs are unaffected. Because this potential offset could mask consequences to new debt issues considered using means, we investigate changes in higher-order moments of municipal debt characteristics. Specifically, if GASB 34 offers an auditable and low-cost mechanism that creates identifiable separation between high-quality and low-quality governments, then such separation potentially manifests as changes in the shapes of the distributions of debt characteristics beyond changes in the means.

Existing theory provides little to guide expectations about how GASB 34 may affect debt characteristic distributions. For example, if post-GASB 34 separation transpires such that debt financing costs are lower for high-quality issuers (higher for low-quality issuers), then high-quality issuers are expected to increase (low-quality issuers decrease) their use of public debt. Such a scenario increases the variance in the observed distribution of new public debt per capita. On the other hand, if debt costs increase to the point where low-quality governments exit the public debt markets, then the *observed* post-GASB 34 distribution (created using new issues) includes new debt for only high-quality governments and the variance of the distribution of new debt per capita is lower post-GASB 34. Thus, we address null hypotheses that distributions do not change following GASB 34 implementation.

### 2.4 Expected Responses by Governments to GASB 34

We examine three consequences of GASB 34 on government debt issuance behavior: new debt effects, debt shifting effects, and anticipatory effects.** First, we conjecture that the issuance of new debt

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11 Spreads are more commonly missing during the pre-GASB 34 period than during the post-GASB period, which elevates concerns that comparisons are distorted by selection bias. Specifically, 19% of 1998 through 2001 new debt
securities in part depends on financial quality. We use the term *new debt effects* when referencing pre-versus post-GASB 34 changes in new debt issues. If GASB 34 informs within-sector comparisons that create separation within municipal debt markets, then we anticipate changes in the cost of new debt financing at the margin. Such changes likely alter incentives to use public debt financing. We anticipate that high-quality governments issue relatively more new public debt than low-quality governments following GASB 34 adoption.

Second, we expect governments to allocate debt burdens among state government and composite governmental units to minimize aggregate marginal financing costs. We use the term *debt shifting effects* when referencing such behavior. We expect debt shifting to occur between entities following GASB 34 if separation reveals that composite governments have differing financial quality. Three forms of debt burden shifts are considered: the issuance of debt by state versus local government entities; the issuance of debt by general government versus special-purpose government entities; and the issuance of general obligation debt secured by the “full faith and credit” of the government versus revenue debt secured by specific prospective revenue streams. Note that while we expect states to modify new debt allocations in order to continue minimizing aggregate marginal debt costs, we lack a convincing theory to guide directional predictions.

Finally, because GASB 34 was codified in 1999 but was not effective for the first set of governments until fiscal years ending after June 15, 2002, governments had time to alter decisions to issue debt in anticipation of GASB 34 implementation. High-quality governments have incentives to delay debt issuances until after GASB 34 when financial quality is revealed, and low-quality governments have similar incentives to accelerate debt issues to before GASB 34. We use the term *anticipatory effects* when referencing such strategic behavior. Features of our empirical design exploit the notion that

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issues are missing spreads, whereas spreads are missing for only 5% of 2004 through 2007 issues. Additionally, focusing on issuer responses offers a new perspective to existing literature. For these reasons, we choose not to rely on comparisons of interest spreads to infer the consequences of GASB 34 disclosures.
anticipatory effects – whether and how governments issue debt around prospective GASB 34 disclosures - - reveal financial quality.

2.5 Cross-sectional Comparisons

Separation in the municipal debt markets suggests that governments are differentially affected – and therefore respond differently – following financial disclosures provided through GASB 34 adoption. To investigate, we condition GASB 34 consequences on three state characteristics that, given the findings of prior research, could relate with such differentiation.

First, some states require composite entities to use GAAP accounting for external financial reporting. Baber and Gore (2008) find that municipalities in states that require GAAP have greater access to the bond market. One perspective is that GASB 34 consequences are more substantial in these states, as composite governments are required to implement GASB 34. In states that do not mandate GAAP accounting, however, governments can and do adopt GAAP voluntarily (Gore 2004). If high-quality governments in non-GAAP states can voluntarily adopt GASB 34 to distinguish themselves from low-quality governments, then GASB 34 can have more substantial consequences in non-GAAP states. Thus, expectations about the specific role of GAAP requirements are not straightforward.

Second, considerable variation exists in the extent that state governments regulate and monitor financial activities of composite state and local government units. Prior research suggests that access to the municipal bond market is positively associated with state oversight (e.g., Moldogaziev et al. 2017; Gao et al. 2018). Specific expectations about the role of governance pre- versus post-GASB 34 depend on whether oversight and disclosure are economic substitutes or complements. If state oversight provides assurance to lenders that substitutes for disclosure, we anticipate that governments located in states with effective oversight benefit less from GASB 34. On the other hand, if state oversight is a compliment to disclosure, then GASB 34 consequences are more substantial in states with effective oversight. For example, state requirements to file financial statements with the state or to undertake a financial audit can be more impactful when disclosure increases following GASB 34. Although specific expectations are unclear, we condition pre- versus post-GASB 34 changes in debt characteristics on state oversight.
Third, we consider political stability as a determinant of GASB 34 consequences. Prior research suggests that political synergies influence both public debt issuance (e.g., Baber and Sen 1983) and disclosure (e.g., Baber 1990). We posit that elected officials have incentives to advance the collective success of their respective political parties as they administer and oversee public debt. We posit further that cooperation among government units within a state encourages financing strategies – including decisions to issue debt and shift debt burdens – that minimize financing costs incurred within the consolidated state entity. If this characterization of cooperation applies, then constructive response to incentives created by GASB 34 implementation are more substantial when elected officials share political party affiliation. If competition (rather than cooperation) between political parties encourages efficiency in government by disciplining political agents, however, then we expect the opposite. Thus, specific expectations again are unclear. Even so, we condition changes in debt characteristics pre vs. post-GASB 34 on within-state political party stability.

Note that we do not formally hypothesize on the direction of the associations between the three state-level dimensions and GASB 34 consequences. In addition to acknowledging that any of the three could enhance, or attenuate, the effects of GASB 34 between states, we also raise the possibility that issuer quality within states could vary such that changes conditioned on these characteristics are difficult to detect. For example, if GASB 34 does indeed encourage separation between issuers, and separation effects are augmented in states that require GAAP, then differential changes between high- and low-quality issuers within GAAP states may offset and preclude us from detecting a change in means. Further, if issuer quality was clearly distinguishable prior to GASB 34 based on these ex ante characteristics, the incremental value of GASB 34 disclosures might be negligible. Nevertheless, we pursue our investigation of these measures as they are grounded in prior research and plausibly delineate between settings where GASB 34 disclosures are more or less impactful.

2.6 The Bush Tax Cuts as a Confounding Event

Following the 2000 presidential election, the US Congress enacted the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA) and the Jobs and Growth Tax Relief Reconciliation Act of
2003 (JGTRRA). Commonly referred to as the “Bush Tax Cuts,” these two pieces of legislation lowered individuals’ statutory federal income tax rates. Interest income from most state and local government debt is exempt from federal income taxation, so municipalities can offer investors a lower rate of return relative to investment alternatives that are taxable. To illustrate, an investor with a statutory federal tax rate of 30% is indifferent between a municipal bond that offers a 7% rate of return and a corporate bond of comparable risk that offers a 10% rate of return, because both investments offer a 7% after-tax rate of return. If the statutory federal tax rate is lowered, the corporate bond yields an after-tax rate of return greater than 7%. Thus, municipal debt becomes less attractive relative to investments that provide taxable returns. The effect at the margin is to increase the cost of municipal debt, which in turn reduces governments’ incentives to issue public debt.

The Bush Tax Cuts occur during the period when most large US governments – the governments that dominate our sample – are first required to use GASB No. 34 accounting standards. Notice, however, that the empirical consequences of Bush Tax Cuts similarly reduce the incentive for all US state and local governments to issue debt. The Bush Tax Cuts do not predict separation in municipal debt markets, and therefore do not explain debt burden shifting or changes in higher moments of post-GASB 34 distributions of new public debt characteristics.

3. Data and Constructs

3.1 Sample

For each of the fifty US states, we access all state and local municipal bond issues from 1998 through 2007 in the Mergent Municipal Bond Securities database. Variables are constructed by aggregating all new uninsured and non-refunding debt issues. We delete observations where key issuer

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12 The EGTRRA was signed into law on June 7, 2001. Low-income taxpayers received a 5% federal income tax rate reduction effective retroactively as of February 1, 2001, while high-income taxpayers received a 3% to 4.6% reduction that was prospectively phased in over time. The JGTRRA was signed into law and effective as of May 28, 2003, and accelerated the graduated pace of the 2001 tax rate reductions for all taxpayers. The JGTRRA also created a separate tax rate for qualified dividend income, reducing the rate from a maximum of 38.6% to a maximum of 15%. 

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characteristics (e.g., issuer name or state) and issue characteristics (e.g., type of security, amount of principal) are missing.\(^{13}\) As variables are computed at the state level, we delete issues by Washington DC, Native American tribes and reservations, and US territories and protectorates. We exclude refunding bonds because they represent refinancing of previously issued debt, whereas our focus is on new debt. We also exclude insured bonds\(^{14}\) and conduit bonds\(^{15}\) because the cost of debt depends on the credit quality of the insurer or beneficiary respectively, and therefore, GASB 34 disclosure does not affect the cost of these debt issues. These procedures yield a sample of 385,776 bond issuances during the ten-year period.

Figure 1 indicates the period used to execute our empirical analyses. GASB enacted Statement No. 34 in June 1999, but the standard was effective for the largest municipalities and for all state general governments for fiscal years ending after June 15, 2002. Data from the National Association of State Auditors, Comptrollers, and Treasurers (NASACT) reveals that state CAFRs for the first fiscal year ending after June 15, 2002 were all prepared according to GAAP and transmitted from November 22, 2002 (Utah) through December 19, 2003 (New Mexico). Thus, all 50 state governments provided GASB 34-compliant CAFRs as of the end of 2003. We eliminate calendar years 2002 and 2003, as GASB 34 consequences are not straightforward during these transition years. We end the post-adoption period in calendar year 2007 to avoid the confounding effects of the 2008 global financial crisis. Thus, we designate the four years 1998 through 2001 (159,375 issues during 16 quarter-years) as the pre-adoption period \((POST = 0)\), and the four calendar years 2004 through 2007 (149,397 issues during 16 quarter-years) as the post-adoption period \((POST = 1)\).

We aggregate debt issues for all state and local governments within a state to obtain fifty consolidated debt-issuing units per time period. This unit of analysis differs from prior municipal

\(^{13}\) We omit observations with missing values for Mergent data items \(\text{security\_code\_i, issuer\_long\_name\_c, and state\_c}\), and where the issue amount (data item \(\text{total\_offering\_amount\_f}\)) is zero or missing.

\(^{14}\) If \(\text{bond\_insurance\_code\_c or mtg\_insurance\_code\_c}\) is non-missing, then \(\text{Insured} = 1\); else \(\text{Insured} = 0\). Note that our sample period precedes the dissolution of the major municipal bond insurance agencies following the recession (Cuny 2016).

\(^{15}\) Conduit bonds are issued by a governmental entity on behalf of a private entity, typically because the private entity agrees to use the proceeds for public good (e.g., nonprofit hospitals and private schools that issue bonds through a municipal conduit).
accounting studies that focus only on state governments (Baber 1983; Kido et al. 2012; Costello et al. 2016), city governments (Giroux and McLelland 2003; Gore 2004; Baber and Gore 2008; Baber et al. 2013; Beck 2018), or special governmental entities (Plummer et al., 2007). Organizing governmental entities at the aggregate state level has advantages that we exploit in our empirical investigation. In particular, we can investigate both new debt and debt shifting effects, including how these effects interact. This tactic also facilitates investigation of cross-sectional differences in state characteristics that potentially influence the consequences of GASB 34. Thus, addressing samples at the aggregated state level supports a more comprehensive investigation on potentially important dimensions than what is in the literature presently. This aggregation generates 1,600 state-quarter observations (e.g., 50 states * 8 years * 4 quarters; 800 in the pre-GASB 34 period and 800 in the post-GASB 34 period).

3.2 Measures of Debt Characteristics

We consider five debt characteristics. The first two variables reflect debt issuances – the amount of new public debt per capita issued by composite governments within the state (NEWDEBTPC) and the number of composite governments in the state that issue public debt (ISSUERS). The ISSUERS variable facilitates comparisons of whether individual governments decide to participate in the public debt market. Such comparisons can be misleading, however, to the extent that new governmental entities are created by existing governmental entities in order to shift debt burdens.

The remaining three variables capture debt shifting – the fraction of debt issued by state (versus local) governments (STATE%); the fraction of new debt issued by general (versus special district) government units (GENGOV%); and general obligation (versus revenue) debt as a fraction of aggregate state debt (GO%). All variables are aggregated within state \( k \) and for quarter-year \( t \). STATE% is the proportion of aggregate new debt issued at the state level within a quarter-year (e.g., state governments and special purpose state-level entities). GENGOV% is the proportion of aggregate new debt issued by a

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16 CUSIP is described as a unique identifier by Mergent, so we use the first six digits of an issuer’s CUSIP to distinguish unique issuers. We observe that some issuers with the same name can have more than one 6-digit CUSIP; results are consistent if we measure unique issuers using the Mergent issuer name field (untabulated).
general purpose governmental entity (as opposed to a special purpose governmental entity) with a state-quarter-year. General purpose governmental entities provide a comprehensive set of core governmental services, while special purpose governmental entities are legally separate entities established to provide a limited set of services or functions. Examples of special purpose governmental entities include independent school districts, sports stadium authorities, and transportation authorities. Finally, government debt issues are of two types. General obligation debt is secured by the “full faith and credit” of the taxpaying citizenship, while revenue debt is secured by a specified revenue stream (e.g., tolls, user fees, or even a specifically-identified component of future tax revenues). The variable GO% is the proportion of aggregate debt issued that is considered general obligation within a state-quarter-year.

Detailed variable definitions are in Appendix A, and Appendix B uses an example to illustrate how each variable is computed within one state in one quarter-year. Note that the state, general purpose, and general obligation categories are not mutually exclusive. The example in Appendix B illustrates potential overlap among the debt shifting categories.

3.3 Measures of State Characteristics

Among the procedures designed to consider separation in debt markets, we delineate the states according to three features that prior research documents are associated with municipal disclosure and bond market participation, and thus plausibly influence the consequences of GASB 34 implementation. Delineations are made using state-level measures presumed not to vary throughout the sample period.

First, we create an index of state GAAP requirements that is increasing in the extent that GAAP reporting requirements are imposed on the state government and on composite unit categories. In particular, GAAPREQ increases by one when GAAP reporting is required for each of the state government (NASACT 2014), the county governments, city governments, or school districts within the state (Khumawala and Neely 2008). Thus, GAAPREQ = {0, 1,… 4}.

Second, we construct a state government oversight index. Specifically, OVERSIGHT is the sum of the following characteristics: whether the state imposes expenditure limits on local governments
(Mullins and Wallin 2004); has an appointed (versus elected) state comptroller or treasurer;\(^\text{17}\) whether the state requires composite governments to present official statements to the state finance office for review and approval in anticipation of debt issues; and whether the state government prohibits bankruptcy by composite governments (Moldogaziev et al. 2017; Gao et al. 2019). Thus, \(OVERSIGHT = \{0, 1, \ldots, 4\}\).

Finally, we employ a measure of political stability to investigate the role of cooperation among governmental units. The count variable \(POLSTABILITY\) is measured as the number of years during 1998 through 2007 that the state legislative and executive branches are controlled by the same political party (Klarner 2003). Thus, \(POLSTABILITY = \{0, 1, \ldots, 10\}\). Partisan division of the legislative and executive branches suggests political instability which, we reason, negates cooperation.

4. Data Analysis

We are interested in how municipalities respond to GASB 34 in the context of public debt markets. In particular, we seek evidence regarding new debt effects, debt shifting effects, and anticipatory effects in municipal debt markets surrounding the implementation of GASB 34. We focus on pre- versus post-GASB 34 changes in five characteristics of new public debt issues.

4.1 Regression Specifications

We begin by estimating regression specifications designed to compare pre- versus post-GASB 34 means of the five characteristics. As discussed previously, we use a panel of 1,600 state-quarter-year observations to estimate the following regression specifications. The 800 observations from 1998 through 2001 are designated \(POST = 0\), and the 800 observations from 2004 through 2007 are designated \(POST = 1\). The dependent variable \(Debt\ characteristic\) denotes one of five debt characteristics: \(NEWDEBTPC, ISSUERS, STATE\%, GENGOV\%,\) and \(GO\%\).

\(^{17}\) State controller data are at https://ballotpedia.org/Controller_(state_executive_office). Treasurer data are at https://ballotpedia.org/Treasurer_(state_executive_office). Ballotpedia is an online encyclopedia of elections, politics, and public policy sponsored by the Lucy Burns Institute. Postings are researched, written, and verified by Institute staff.
As our study is the first to directly examine municipal debt characteristics pre- versus post-GASB 34, and the first to consider changes in the number of issuers and debt shifting within states, we begin our analyses by estimating simple specifications to document changes in these variables over the sample period. The first specification tests for a mean change post-GASB 34:

\[1\]  
\[
\text{Debt characteristic} = \alpha_0 + \alpha_1 (\text{POST}) + \text{STATE FIXED EFFECTS} + \varepsilon
\]

The indicator variable \( \text{POST} \) delineates 1997 to 2001 observations \((\text{POST} = 0)\) from 2003 to 2007 observations \((\text{POST} = 1)\). Thus, the parameter \( \alpha_1 \) indicates the change in the debt characteristics following GASB 34 implementation, after controlling for state fixed effects. Note that quarter-year fixed effects cannot be included because they are perfectly collinear with \( \text{POST} \).

To test whether time trends distort comparisons obtained from specification [1], we estimate:

\[2\]  
\[
\text{Debt characteristic} = \beta_0 + \beta_1 (\text{POST}) + \beta_2 (\text{TIME TREND}) + \text{STATE FIXED EFFECTS} + \varepsilon
\]

\( \text{TIME TREND} \) is an ordinal variable that distinguishes the calendar year of aggregate debt issues, and the parameter \( \beta_1 \) indicates the change in new debt characteristics following GASB 34 implementation that is not explained by state fixed effects or a time trend. Again, quarter-year fixed effects cannot be included because they are perfectly collinear with \( \text{POST} \).

To investigate separation in the municipal debt market, we first condition changes in debt characteristics on state characteristics that plausibly influence how governments respond to GASB 34 implementation and estimate:

\[3\]  
\[
\text{Debt characteristic} = \delta_0 + \delta_1 (\text{POST X STATE PROFILE}) + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \varepsilon
\]

\( \text{STATE PROFILE} \) is one of the three state-level measures \((\text{GAAPREQ, OVERSIGHT, or POLSTABILITY})\) that distinguish each state on dimensions that potentially influence the consequences of GASB 34 implementation. Thus, the parameter \( \delta_1 \) indicates whether pre- versus post-GASB 34 comparisons vary according to these state characteristics. The \( \text{STATE} \) fixed effects control for other sources of state heterogeneity (e.g., state tax laws). The \( \text{QTRYEAR} \) fixed effects control for
macroeconomic conditions that effect the municipal market as a whole. Observe that including state (quarter-year) fixed effects in specification [3] subsumes the main effect of STATE PROFILE (POST)

4.2 Comparisons of Distributions

We next advance an alternative approach inspired by possibility that methods focusing on distribution means – for example, regression specifications – potentially obscure the separation effects of GASB 34 when governments are differentially affected according to financial quality. To execute this approach, we first estimate the following specifications using a sample of 2,000 state-quarter observations (50 states * 10 years * 4 quarters per year) using data from 1998 through 2007.

\[ \text{Debt characteristic} = f \{\text{STATE FIXED EFFECTS}; QTRYEAR FIXED EFFECTS}\]

We use STATE FIXED EFFECTS (QTRYEAR FIXED EFFECTS) to remove mean effects of cross-sectional differences among states (factors correlated with time). Thus, we interpret residuals from expression [4] as the variation in debt characteristics unexplained by state or time effects.\(^\text{18}\)

After omitting observations from the transition period (calendar years 2002 and 2003), we partition observations according to the pre-GASB 34 period (800 residuals from calendar years 1998 to 2001) and the post-GASB 34 period (800 residuals from calendar years 2003 to 2007) and construct distributions of the residuals for each partition. Finally, we provide both visual and non-parametric statistical comparisons of pre- versus post-GASB 34 distributions.

Recall that specific predictions about comparisons of distributions typically cannot be supported by theory. To illustrate, consider new debt issues. Recall that we posit separation in debt markets results because financial quality is revealed through the application of GASB accounting. Thus, we expect that high-quality governments realize lower costs of debt financing and therefore increase their use of debt financing following GASB 34 implementation. In contrast, low-quality governments realize higher debt costs, and therefore reduce their use of debt financing. One perspective is that the foregoing characterization predicts higher variance for the post-GASB 34 distribution. On the other hand, if higher

\(^{18}\) Residuals from Debt characteristic = f \{STATE FIXED EFFECTS; STATE FIXED EFFECTS X TIMETREND\} yield results similar to those obtained using residuals from expression [4].
debt costs cause lower low-quality governments to exit the public debt markets, then observed post-GASB 34 distributions of new debt issues – now composed primarily of high-quality governments – can exhibit lower variance following GASB 34.

This, and other such reasoning limits what can be learned from comparing pre- and post-GASB 34 distributions of new debt characteristics. Even so, these comparisons of distributions can corroborate or complement interpretations of evidence obtained from alternative procedures. Thus, we address the null hypotheses that pre- and post-GASB 34 distributions are identical, although we are reluctant to provide alternative directional hypotheses.

4.3 A Test of Anticipatory Effects

We exploit the unusually long GASB 34 implementation period to document anticipatory effects. Assume that government officials know better financial quality of their government, and therefore are better aware of the consequences of GASB 34 disclosures, than prospective investors. Assume further that government officials act to minimize financing costs. If so, then high-quality governments have incentives to defer debt issues at the margin in anticipation of lower debt financing costs following GASB 34 implementation. Conversely, low-quality governments have incentives to accelerate debt issues in anticipation of higher debt costs following implementation.

To investigate whether this characterization applies, we use 1997 to 2008 data to estimate expression [4] using NEWDEBTPC as the dependent variable. Residuals are cumulated to obtain annual observations for each calendar year. Positive (negative) residuals are construed to be years when the state issues more (less) new debt per capita than expected. Because we expect anticipatory effects to manifest prior to GASB 34 implementation, we are most interested in new debt issues for the two years 2001 and 2004 that encompass GASB 34 implementation. Thus, for the year before (2001), and for the year after (2004), the GASB 34 transition period, we classify the states according to whether cumulative residuals

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19 We expand the estimation period to twelve years so that we can provide non-overlapping counterfactual distributions to evaluate whether the distribution during the test period is unusual.
are positive or negative. In other words, we delineate high-versus low-quality composite governments based on their apparent strategies (observed *ex post*) in anticipation of GASB 34.

States with positive cumulative residuals during the year prior to (2001), and negative cumulative residuals during the year following (2004), are designated as accelerators (ACCELERATOR = 1).

Accelerating debt issuance prior to GASB 34 implementation suggests a low-quality strategy, as such behavior avoids public debt financing cost increases that informed government officials expect when GASB 34 disclosures reveal negative information to investors. Thus, accelerator states, because they issue greater than expected new debt before and less than expected debt after GASB 34 implementation, are presumed to be low-quality governments.

Conversely, states with negative cumulative residuals during the year prior to and positive cumulative residuals during the year following, are designated as delayers (DELAYER = 1). Delaying debt issuance until after GASB 34 implementation is consistent with the strategy of a high-quality government, because GASB 34 disclosures are expected to allow high-quality governments to distinguish themselves from lower-quality governments and achieve a lower cost of debt. Thus, delayer states are presumed to be high-quality governments.

The two-by-two distribution of the states according to the years 2001 and 2004 that encompass the GASB 34 implementation is designated the test distribution. To ascertain whether new debt issues are atypical during the GASB 34 implementation period, we compare test distribution with counterfactual distributions constructed for non-overlapping contiguous four year-windows 1997 to 2000 and 2005 to 2008. We interpret statistically significant differences to be evidence of GASB 34 anticipation effects.

4.4 Cross-sectional Comparisons using Accelerators and Delayers

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20 Results are comparable when median cumulative residuals (rather than positive versus negative residuals) are used to classify the states.

21 Results are comparable when residuals cumulated over two years prior (2000 and 2001) and two years followings (2004 and 2005) are used construct the 2x2 classification.
Finally, we exploit the accelerator versus delayer classification to execute cross-sectional comparisons of changes in debt characteristics in the context of regression specifications. In particular, we estimate:

\[ \text{Debt characteristic} = \mu_0 + \mu_1 \times \text{POST} \times \text{DELAY} + \mu_2 \times \text{POST} \times \text{ACCELERATOR} + \text{STATE fixed effects} + \text{QTRYEAR fixed effects} + \epsilon \]

where the indicator variables \text{DELAY} and \text{ACCELERATOR} are specified according to the classification described above.

5. Empirical Results

5.1 Descriptive Statistics

Panel A of Table 1 summarizes distributions for characteristics of new debt issues (the dependent variables) and measures that distinguish state profiles. For dependent variables, recall that data are aggregated to obtain one observation per state-quarter-year, which yields 2,000 observations during the period 1998 through 2007. Mean issues for state-quarters are $75.38 (median of $48.78) per capita. A mean of 21 (median of 12) unique entities issue new debt per state-quarter. The mean (median) proportion of debt issued by state-level entities relative to local-level entities is 43% (40.5%); the mean (median) proportion of debt issued by general government entities relative to special districts is 43.7% (39.3%); and the mean (median) proportion of general obligation debt relative to revenue debt is 42.1% (38.9%).

Previous research has only examined one of our dependent variables (NEWDEBTPC), and has not examined any of our dependent variables over the time period spanning pre- and post-GASB 34 implementation. To assist future research, we document the annual means for each dependent variable over the sample period visually in Figure 2. Note that 2002 and 2003 are designated as the GASB 34 implementation period in our analysis. Panel A indicates an increase in new debt per capita (NEWDEBTPC) following GASB 34. A similar trend appears in Panel B, which shows the annual means for ISSUERS. Time series displayed in Panels C and D for the proportions of state (STATE%) and general
obligation (\textit{GENGOV\%}) debt are volatile and difficult to interpret visually. Panel E shows that the use of general obligation debt (\textit{GO\%}) decreases, although trend changes are difficult to discern.

Distributions for measures that distinguish the 50 state profiles are also displayed in Panel A. States impose GAAP requirements on a mean of 2.14 (median of 2) out of the four possible levels of government, and the mean (median) \textit{OVERSIGHT} index is 1.22 (1) out of four possible oversight metrics. Mean (median) \textit{POLSTABILITY} is 5.44 (6), indicating that a single political party presides over the legislative and executive branches of state government about half the time. Our anticipatory variables reveal that 44\% (20\%) of states are classified as accelerators (delayers), with remaining states classified as neither accelerators nor delayers. Table 1, Panel B (C) provides correlations between dependent variables (state characteristics). In Panel B, Spearman correlations range from -0.12 to 0.49, indicating significant variation in the relation between individual debt characteristics. In Panel C, most of the correlations between state characteristics are insignificant.

\textbf{5.2 Regression Specifications}

Results for specifications of expressions [1] and [2] are presented in Table 2. In Panel A, we document changes in debt characteristics following GASB 34, controlling only for state fixed effects. We observe significant increases in new debt per capita ($a_1 = 51.136; p < 0.01$) and the number of issuing entities within a state ($a_1 = 10.919; p < 0.01$) following GASB 34. Regarding shifting effects, the proportion of G.O. debt declines ($a_1 = -0.063; p < 0.01$), but the change in the proportions of state debt and general government debt are statistically insignificant. In Table 2, Panel B, we consider time trends (\textit{TIMETREND}) in the dependent variables during the sample period. When \textit{TIMETREND} is included as an independent variable, the parameter estimate $\beta_1$ on $\text{POST}$ is statistically significant in none of the five columns. Thus, evidence in Table 2 indicates no statistically reliable change in debt characteristics following GASB 34 implementation beyond what is explained by the time trend. This suggests one of two possible scenarios: either GASB 34 has no discernable impact on these dependent variables, or GASB 34 impacts governments differentially such that positive and negative effects offset.
We next investigate whether the effect of GASB 34 on our five dependent variables is a function of three state-level characteristics. Table 3 presents the results for expression [3], which focus on interactions (POST X STATE PROFILE). Note that the main effect POST (STATE PROFILE) is subsumed by quarter-year (state) fixed effects. Panel A considers whether changes in debt characteristics following GASB 34 are associated with state government-imposed GAAP requirements (GAAPREQ). Column 5 weakly suggests that states with more stringent GAAP requirements issue lower proportions of GO debt following GASB 34 ($\delta l = -0.028; p = 0.057$), but results are not significant for our other dependent variables. In Panel B where OVERSIGHT is the interacting variable, we find weakly significant evidence in Column 1 that new debt per capita is greater following GASB 34 in states with greater state oversight ($\delta l = 10.540; p = 0.087$). Column 5 suggests that oversight is weakly associated with a higher proportion of GO debt ($\delta l = 0.033; p = 0.081$) following GASB 34 implementation. Finally, Panel C shows that political stability (POLSTABILITY) differentially affects none of the five debt characteristics post-GASB 34. As a whole, the evidence in Table 3 fails to convincingly support separation in debt markets on dimensions that prior literature suggests potentially influence the consequences of GASB 34 implementation. Such results for comparisons of means indicate either that GASB 34 has no detectable effect on pre- versus post-GASB 34 comparisons of debt characteristics, or that GASB 34 impacts governments differentially such that positive and negative consequences offset within cross-sections.

5.3 Comparisons of Distributions

Among the explanations for why the evidence obtained from regression specifications is not statistically significant are the possibility that GASB consequences are more complex than what can be detected using methods that focus on changes in distribution means. Thus, we consider an approach that focuses on higher moments of new debt characteristic distributions and does not require specific ex ante expectations about factors that influence GASB 34 consequences.

We use two non-parametric statistical methods – the two-sample Kolmogorov-Smirnoff (K-S) test and the Brown-Forsythe (B-F) test – to compare the distributions of each of the five debt characteristics. The K-S test considers whether pre- and post GASB 34 cumulative distributions are from
the same underlying distribution; the Brown-Forsythe (B-F) test considers differences between pre- and post-GASB 34 distribution variances. The K-S test is the broader, but less statistically powerful, of the two. As our intent is to detect changes in moments of the distribution beyond the mean (which we have already examined using regressions), we demean the five debt characteristics by taking the residual of expression [4] for each. Recall that residuals are interpreted as variation in debt characteristics unexplained by state and time effects.22

Table 4 displays results for these comparisons. K-S statistics indicate that pre-GASB 34 distributions of NEWDEBTPC, ISSUERS, and STATE% residuals differ significantly from the post-GASB 34 distributions (p < 0.010, < 0.010, and = 0.068, respectively).23 B-F statistics indicate variance increases for distributions of NEWDEBTPC and ISSUERS residuals in the post-GASB 34 period, which is consistent with between-state separation in municipal debt markets. Variances for distributions of residuals using debt shifting variables (STATE%, GENGOV%, GO%) decline significantly following GASB 34 adoption. One explanation for this suggests within-state separation following GASB 34, which could encourage reallocating debt to higher-quality governments. If so, these allocations potentially become more uniform across states.

Visual representations of pre- versus post-GASB 34 distributions of expression [4] residuals for each new debt characteristic are provided in Figure 3. For each debt characteristic, we provide comparative probability density functions (figures to the left), cumulative density functions (figures to the right), and descriptive statistics for the higher distribution moments. For visual aid to accompany the K-S test, which measures the statistical significance of the largest difference between the two distributions, we refer to the cumulative density functions. The visual evidence is consistent with the statistical evidence, as the difference in the distributions is visibly apparent for NEWDEBTPC, ISSUERS, and (to a lesser extent)

22 Residuals using specifications Debt characteristic = β0 + β1 (iSTATE FIXED EFFECTS * TIMETREND) + STATE FIXED EFFECTS + e yield results comparable to those reported (untabulated).

23 Results are comparable when bootstrapping is used to set significance levels. In particular, randomly assigning cumulative residuals for the ten calendar years that comprise the test period to the four-year pre-GASB 34, two-year transition period, and the four year post-GASB 34 years (10,000 iterations) yields significance levels comparable to those reported.
in contrast with the \textit{GENGOV}\% and \textit{GO}\% plots (for which the K-S test did not detect significant pre-post differences). The probability density functions are useful for visualizing changes in specific moments of the distributions, including the change in variance, which the B-F test indicates is significant for all five characteristics. These comparisons indicate increases in the standard deviation, skewness, and kurtosis for \textit{NEWDEBTPC} and \textit{ISSUERS}. Changes in the distributions for measures of shifting effects (\textit{STATE}\%, \textit{GENGOV}\%, \textit{GO}\%) are less substantial, and we note that although the B-F test detects statistically significant decreases in variance, such changes do not appear visually or economically significant when considering the plots and descriptive statistics in Figure 3.

\textbf{5.4 Anticipatory Effects}

Table 5 shows 2x2 distributions of the states according to the sign of cumulative residuals from estimating expression [4] with \textit{NEWDEBTPC} as the dependent variable. Column 2 shows the 2001 versus 2004 test distribution; we focus on the off-diagonals. The southwest cell of the test distribution indicates 22 accelerator (presumed low-financial quality) states; the northeast cell indicates 10 delayer (high-quality) states. Notice that frequencies in these cells are greater than expected frequencies computed using marginal distributions. Column 1 (3) shows the counterfactual distributions for the contiguous four-year window before (after) the GASB 34 implementation period. In contrast with the Column 2 distribution, frequencies in the southwest and northeast cells of the Columns 1 and 3 distributions are less than expected given the marginal distributions. Statistical comparisons of the test distribution (Column 2) against the control distributions (Columns 1 and 3) are statistically significant. We interpret these comparison as evidence that governments anticipate, and strategically respond to, consequences from GASB 34 implementation.

Next we set the indicator variable \textit{DELAYER (ACCELERATOR)} = 1 for the 10 (22) states in the northeast (southwest) quadrant of the 2x2 in Column 2 of Table 5. Consistent with analyses displayed in Table 3, we use data from 1998-2007 to estimate expression [5], but we exclude the additional years 2001 and 2004 because these years are used to identify the \textit{DELAYER} and \textit{ACCELERATOR} classifications.
Thus, results displayed in Table 6 are for 1200 observations (50 states x 12 quarters before and 12 quarters after GASB 34 implementation). We address the null hypotheses that parameter estimates on the \((POST \times ACCELERATOR)\) and \((POST \times DELAYER)\) interactions are identical (i.e., \(\mu_1 = \mu_2\)).

When new debt per capita \((NEWDEBTPC)\) is the dependent variable, we find statistically significant differences between delayer and accelerator governments. Delayers (high-quality governments) issue more debt per capita \((\mu_2 = 39.041; p < 0.05)\) and accelerators (low-quality governments) issue less debt per capital \((\mu_1 = -22.076; p < 0.10)\) following GASB 34 implementation. The comparison between parameter estimates is statistically significant \((F\text{-statistic} = 20.69; p < 0.01)\). The results also suggest a statistically significant decline in the number of issuing entities \((ISSUERS)\) in accelerators relative to the base group \((\mu_2 = -8.975; p < 0.05)\) and relative to delayers \((F\text{-statistic} = 7.4; p < 0.05)\). Together, the \(NEWDEBTPC\) and \(ISSUERS\) results are consistent with separation that allows high-quality governments (delayers) relatively greater municipal debt market access following GASB 34.

Additionally, comparisons between delayer and accelerator states suggest that delayers issue a higher proportion of new debt through general governments \((GENGOV\%)\) and general obligation bonds \((GO\%)\). One interpretation for this finding relates to the types of governments and governmental activities that were most affected by GASB 34. For example, GASB 34 requires governments to use accrual accounting to report governmental activities \((i.e.,\) raising and spending tax revenues\)) but governments were already required to use accrual accounting to report their business-type activities \((i.e.,\) those supported by user fees\)) prior to GASB 34 implementation. Similarly, GASB 34 requires consolidation of all activities \((governmental and business-type)\), of which general purpose governments typically have many, but special purpose governments typically have only one. Thus, the incremental information provided by the accrual accounting and consolidation aspects of GASB 34 is significant for substantially all general governments and GO bonds \((which are essentially secured by taxes)\), but only a subset of special purpose governments and revenue bonds. Accordingly, the findings in Columns 4 and 5 suggest that general purpose and GO debt are more prominent in high-quality states following GASB 34. This is consistent with the notion that GASB 34 disclosures benefit governments differentially based on quality.
Overall, the results in Table 6 support a characterization where GASB 34 engendered financial transparency that promotes separation in municipal debt markets.

5.5 Supplemental Tests (untabulated)

We exclude insured bonds from the sample because debt characteristics reflect the financial quality of the insurer, rather than the government issuing the debt. If GASB 34 allows investors to distinguish between issuers, however, then insurance may become more (less) useful for low- (high-) quality issuers. We estimate expression [5] using the fraction of new issuances insured by a third party as the dependent variable using a sample that includes insured bonds. Results indicate that delayers issue a significantly lower proportion of insured debt post-GASB 34. Specifically, the coefficient on the POST X DELAYER interaction is negative (-0.101; p < 0.01), and significantly more negative than the coefficient on the POST X ACCELERATOR interaction (F-Statistic = 4.54; p < 0.10). This result further supports separation in the debt markets between high- and low-quality issuers following GASB 34.24

6. Conclusion

GASB 34 was a controversial and highly anticipated change to governmental financial reporting. The GASB committed 15 years to developing GASB 34, received 400 comment letters related to the standard, and allowed governments at least three years to implement it. Despite the significance of this event, extant research documenting the effects of GASB 34 is scarce, and results are mixed. We differentiate our study from prior research by focusing on how the standard changed governments’ incentives regarding whether, when, and how to issue public debt. We conjecture that GASB 34 facilitated the movement of municipal debt markets from a pooling to a separating equilibrium.

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24 A relatively small sample size of 50 states restricts tests of the extent to which financial quality (as indicated by ACCELERATOR or DELAYER) is associated with GAAP requirements, oversight metrics, or political stability. We compare and find that states categorized as high-quality/delayers rank higher, on average, than both accelerators and the base group (neither accelerators nor delayers) on all three dimensions, but these differences are statistically insignificant. We leave further investigation to future research.
We focus on three potential GASB 34 consequences: the issuance of new debt, debt shifting among composite state government units; and debt issuance delays and accelerations surrounding GASB 34 implementation. Regression results for on-average effects (and cross-sectional effects based on state differences in GAAP requirements, oversight, and political stability) fail to reveal statistically significant differences pre/post-GASB 34. In contrast, non-parametric methods indicate statistically significant distributional changes following GASB 34 implementation, consistent with separation effects. Upon further investigation, we find evidence that governments that delay public debt issuances to post-GASB 34 have greater access to the municipal debt market and are more likely to shift debt burdens to general governments and to use general obligation debt following GASB 34 than governments that accelerate debt issues prior to GASB 34. These results are consistent with the notion that GASB 34 promotes separation in public municipal debt markets by allowing governments to credibly reveal financial reporting quality.

At least two points suggest cautious interpretations of the results. First, we lack plausible counterfactuals (e.g., US governments unaffected by GASB 34). Second, without extensive hand-collection efforts we are unable to identify precisely when GASB 34 information is initially disclosed to debt market participants. Thus, comparisons are necessarily over relatively long event periods. Features of the study are designed to address – although, cannot eliminate – these concerns.

To our knowledge, we are the first to advance the notion that GASB 34 fosters separating equilibria in public debt markets. We introduce several methodological innovations to the governmental accounting literature, including the use of non-parametric empirical methods, the use of municipal data consolidated to the state-quarter level, and consideration of strategic behavior by governments as a means to distinguish financial quality.
References


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### Variable Definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCELERATOR</strong></td>
<td>Indicator set equal to one if a state has a positive residual in 2001 and a negative residual in 2004 when we regress <em>NEWDEBTPC</em> on state fixed effects and year fixed effects using 600 state-year observations from 1997 through 2008, and zero otherwise.</td>
</tr>
<tr>
<td><strong>DELAYER</strong></td>
<td>Indicator set equal to one if a state has a negative residual in 2001 and a positive residual in 2004 when we regress <em>NEWDEBTPC</em> on state fixed effects and year fixed effects using 600 state-year observations from 1997 through 2008, and zero otherwise.</td>
</tr>
<tr>
<td><strong>GAAPREQ</strong></td>
<td>Index that counts the number of entity types required to prepare their financial statements in accordance with GAAP in state ( k ). There are four possible entity types: state government, county governments, city governments, and school districts. The variable can range from 0 to 4, and each state has a unique value during our sample period. Source: Khumwala and Neely (2008); NASACT (2014).</td>
</tr>
<tr>
<td><strong>GENGOV%</strong></td>
<td>Percentage of new debt issuances in state ( k ) and quarter-year ( t ) where the issuer is a general government (as opposed to a special purpose entity) at the state or local level. Source: Mergent.</td>
</tr>
<tr>
<td><strong>OVERSIGHT</strong></td>
<td>Index that counts the number of state government oversight mechanisms in state ( k ): whether the state (1) imposes legal expenditure limitations on local governments, (2) requires appointment (versus election) of the state comptroller, (3) requires composite governments to present official financial statements to the state government for review/approval prior to composite government debt issuances, and (4) prohibits local governments from filing for bankruptcy. The variable can range from 0 to 4, and each state has a unique value during our sample period. Sources: Mullins and Wallin (2004); Moldogaziev et al. (2017); Gao et al. (2019).</td>
</tr>
<tr>
<td><strong>GO%</strong></td>
<td>Percentage of new debt issuances in state ( k ) and quarter-year ( t ) where the issuance is general obligation debt (as opposed to revenue debt). Source: Mergent.</td>
</tr>
<tr>
<td><strong>ISSUERS</strong></td>
<td>Number of unique municipal debt issuers in state ( k ) and quarter-year ( t ). Source: Mergent.</td>
</tr>
<tr>
<td><strong>NEWDEBTPC</strong></td>
<td>Par value of new debt issuances per capita in state ( k ) and quarter-year ( t ). Quarterly population values are interpolated from the annual data. Sources: Mergent (municipal debt issuances) and U.S Census (state population as of the end of year ( t )).</td>
</tr>
<tr>
<td><strong>POLSTABILITY</strong></td>
<td>Index that counts the number of years that the legislative and executive branches are controlled by the same political party in state ( k ) from 1998 through 2007. The variable can range from 0 to 10, and each state has a unique value during our sample period. Source: Klarner (2003).</td>
</tr>
<tr>
<td><strong>POST</strong></td>
<td>Indicator set equal to one for calendar years 2004 through 2007, and zero otherwise.</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>STATE%</td>
<td>Percentage of new debt issuances in state $k$ and quarter-year $t$ where the issuer is a state government or special purpose entity created by the state (as opposed to local governments and special purpose entities created by a local government). Source: Mergent.</td>
</tr>
<tr>
<td>TIMETREND</td>
<td>Count variable set equal to one in 1998, two in 1999….ten in 2007.</td>
</tr>
</tbody>
</table>

Notes: Variables are presented in alphabetical order. The source ‘Mergent’ refers to the Mergent Municipal Bond Securities database.
Appendix B
Computing Dependent Variables

Part A: Illustrative Example using Tennessee 2007Q2

To illustrate how we compute each dependent variable, we refer to the following list of 13 bonds issued within Tennessee during 2007Q2.25

<table>
<thead>
<tr>
<th>Mergent Variable Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>cusip_c</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
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<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

State vs. Local Issuers

We use the issuer name (Mergent data item issuer_long_name_c) to distinguish state (State = 1) versus local (State = 0) issuers. We classify issuers as state issuers (State = 1) if the issuer name begins with a state (e.g., “Tennessee” or “TN”) or contains STATE or ST (e.g., “ST UNIV”, “STATE PUB SCH”, or “ST AID”), as we find that these issues finance state (rather than local) initiatives.26 If the issuer name contains the phrases “CMNTY COLLEGE”, “JR COLLEGE”, “TECH COLLEGE”, or “TECHNICAL COLLEGE”, signifying a community college district, we classify the issuer as State = 1 only if the bond originates in a state that governs community college systems at the state level.27 All other

25 We selected 2007Q2 for its simplicity. The number of bonds issued within Tennessee during a given quarter-year ranges from two (2001Q4) to 191 (2003Q3).
26 “ST” is also the abbreviation for “Saint” (e.g., “ST LOUIS”). Mergent’s formatting guidelines for issuer_long_name_c require the geographic location to be listed first, followed by the type of entity where applicable (e.g., “ST LOUIS MO HSG AUTH REV”). We set State = 0 if the abbreviation “ST” falls at the beginning of issuer name text string.
27 See McGuinness (2014, Appendix A, columns 2 and 5). As an example, the California issuer “SAN MATEO CNTY CALIF CMNTY COLLEGE DIST” is assigned State = 0 because local governments regulate community college districts in California.
issues are designated as local issues \((State = 0)\). In the list above, bonds 8-12 are categorized as \(State = 1\).^{29}

**General Purpose vs. Special Purpose Issuers**

We also use issuer name to distinguish general purpose \((GenPurp = 1)\) versus special purpose \((GenPurp = 0)\) issuers. If an issuer’s name contains a phrase indicating that an issuer is a separate body from the general government, such as “AUTHORITY”, “CORPORATION”, “BOARD”, and “COMMISSION” (and associated abbreviations indicated in the CUSIP manual), we classify the bond as special purpose; if such phrases are not in the issuer name, we classify the bond as general purpose.\(^30\) For example, “HAWKINS CNTY TENN” and “CHATTANOOGA TENN” are general purpose issuers, while “HAWKINS CNTY TENN 1ST UTIL DIST WTRWKS REV” and “CHATTANOOGA TENN HEALTH EDL & HSG FAC BRD REV” are special purpose issuers.

In the list above, bonds 2-5 are classified as \(GenPurp = 1\). This determination is straightforward for bonds 2-4. For bond 5, the \texttt{issuer_long_name_c} “MEMPHIS TENN ELEC SYS REV” does not contain words to indicate the issuer is independent from the general government. We manually examined numerous bond offering documents and concluded that the issuer names not containing the previously described language to indicate independence are likely general government issuances. The disclosure documents for the issuer of bond 5 note that the bonds “will be issued by the City of Memphis, Tennessee,” and that “[t]he City, the issuer of the [bonds], is a municipal corporation of the state of Tennessee”; thus, we classified this issuer as \(GenPurp = 1\). In contrast, the issuer name for bond 1 contains an abbreviation for “board”, and the disclosure documents for the bonds it issues note, “The bonds are issued by the Industrial Development Board of the County of Knox (the ‘issuer’), a Tennessee public nonprofit corporation.” Thus, we classified bond 1 as \(GenPurp = 0\).

**General Obligation vs. Revenue Bonds**

Mergent identifies general obligation issues with data item \texttt{security_code_i} “D” or “K”, so we classify these observations as \(GO = 1\) and all other issuers as \(GO = 0\). We then make exceptions for bonds where the Mergent data item \texttt{issue_description_c} implies a general obligation issue (e.g., includes phrases like “GENERAL OBLIGATION”, “G.O.”, “GO”, or “GEN OBLIG”) or a revenue issue (e.g., includes the phrase “REVENUE” without accompanying phrases like “GENERAL OBLIGATION”, “G.O.”, “GO”, or “GEN OBLIG”). For example, several bonds issued by TENNESSEE ST had \texttt{security_code_i} ≠ “D” and ≠ “K” but \texttt{issue_description_c} = “GENERAL OBLIGATION”, so we classified the issue as \(GO = 1\). In contrast, one bond issued by TENNESSEE ST LOC DEV AUTH REV had \texttt{security_code_i} = “K” but \texttt{issue_description_c} = “State Loan Programs Revenue Bond Anticipation Notes”, so we classified this issue as \(GO = 0\). In the list above, bond 3 is classified as \(GO = 1\) (because \texttt{security_code_i} = “K” and its \texttt{issue_description_c}, “Putters”, does not indicate otherwise).

Note that the three categories \((State, GenPurp, \text{and } GO)\) are not mutually exclusive. For example, the issuer BARTLETT TENN is classified as a general purpose issuer \((GenPurp = 1)\), and the entity issued 89 GO bonds \((GO = 1)\) and 46 revenue bonds \((GO = 0)\) during our sample period. The issuer

\(^{28}\) To avoid misclassifying local issuers with names similar to states (e.g., ‘New York City’ or ‘Washington County’), we classify issues with names \((\text{issuer\_long\_name\_c})\) that contain certain phrases such as “CITY”, “CNTY” (Mergent’s abbreviation for counties), “AREA” (sometimes used to describe a partnership of local issuers in a geographical area), or “TWP” (Mergent’s abbreviation for townships) as local issuers \((State = 0)\).

\(^{29}\) The following are examples of Tennessee issuer names in other quarters classified as \(State = 1\): “TENNESSEE ST”, “TENNESSEE ST SCH BD AUTH”, and “TENNESSEE ST LOC DEV AUTH REV”.

\(^{30}\) We also use the phrases “ADMINISTRATION”, “AGENCY”, “ASSOCIATION”, “COLLEGE”, “CORPORATION”, “DEPARTMENT”, “EDUCATION SYSTEM”, “INCORPORATED”, “INDEPENDENT”, “JOINT POWERS”, “PARTNERSHIP”, “SCHOOL SYSTEM”, “UNIT”, “UNIVERSITY”, and “ZONE” (and associated abbreviations indicated in the CUSIP manual) to identify special purpose issuers \((GenPurp = 0)\).
TENNESSEE HSG DEV AGY \((GenPurp = 0)\) issued one GO bond \((GO = 1)\) and 100 revenue bonds \((GO = 0)\) during our sample period.

These three classifications are presented for the 13 bonds issued within Tennessee during 2007Q2:

<table>
<thead>
<tr>
<th>principal ($)</th>
<th>issuer_long_name_c</th>
<th>State</th>
<th>GenPurp</th>
<th>GO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 5,900,000</td>
<td>KNOX CNTY TENN INDL DEV BRD MULTIFAMILY REV</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 2,000,000</td>
<td>LEWISBURG TENN</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3 7,470,000</td>
<td>MEMPHIS TENN</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4 33,970,000</td>
<td>MEMPHIS TENN ELEC SYS REV</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>5 8,770,000</td>
<td>MEMPHIS TENN ELEC SYS REV</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6 5,000,000</td>
<td>METROPOLITAN GOVT NASHVILLE &amp; DAVIDSON CNTY TENN HEALTH &amp; EDL FAC BRD MULTIFAMILY REV</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7 69,000,000</td>
<td>SEVIER CNTY TENN PUB BLDG AUTH</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8 5,445,000</td>
<td>TENNESSEE ENERGY ACQUISITION CORP GAS REV</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9 21,415,000</td>
<td>TENNESSEE ENERGY ACQUISITION CORP GAS REV</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10 20,000</td>
<td>TENNESSEE HSG DEV AGY</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11 19,495,000</td>
<td>TENNESSEE HSG DEV AGY</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12 29,575,000</td>
<td>TENNESSEE HSG DEV AGY</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13 14,185,000</td>
<td>WILSON CNTY TENN HEALTH &amp; EDL FAC BRD REV</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td><strong>222,245,000</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculating Debt Characteristics Measures

- We calculate the variable \(NEWDEBTPC\) by summing the total amount of bond issuances within Tennessee for 2007Q2 \(($222,245,000$)\) and dividing by and the estimated state population for the quarter \((6,132,247)\),\(^{31}\) which yields \$36.242.
- We identify unique issuers using the first six digits of \(cusip_c\), which the CUSIP manual designates as the issuer identifier. This results in \(ISSUERS = 9\).\(^{32}\)
- We calculate the variable \(STATE\%\) by summing all \(State = 1\) issuances \($75,950,000\) and dividing by total debt issuances \($222,245,000\), which yields \(34.17\%\).
- We calculate the variable \(GENGOV\%\) by summing all \(GenPurp = 1\) issuances \($52,210,000\) and dividing by total debt issuances \($222,245,000\), which yields \(23.49\%\).
- We calculate the variable \(GO\%\) by summing all \(GO = 1\) issuances \($7,470,000\) and dividing by total debt issuances \($222,245,000\), which yields \(3.36\%\).

Part B: Relationships among Debt Categories

\(^{31}\) We obtain annual state population data from the Census and estimate quarterly growth rates for each year by dividing the annual growth rate by four. We use this estimate of quarterly population growth to interpolate the state’s population during each quarter.

\(^{32}\) To our knowledge, \(cusip_c\) is the most accurate way to identify unique issuers. Our results are insensitive to calculating \(ISSUER\) using \(issuer_long_name_c\) instead of \(cusip_c\).
The table below summarizes the distribution of bond issuances by category (in $M) for our full sample of bonds (385,776 issuances during our sample period). Thirty-three percent of state-issued bonds (State = 1) are issued by the general government (Gen = 1) and 30% of state-level bonds are G.O. bonds (GO = 1). Eleven percent of general government-issued bonds (GenPurp = 1) are issued by state-level entities (State = 1), and 72% are G.O. bonds (GO = 1). Eight percent of G.O. bonds (GO = 1) are issued by the state government (State = 1), and 55% are issued by general government entities (Gen = 1).

<table>
<thead>
<tr>
<th>GenPurp=1</th>
<th>State=1</th>
<th>State=0</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>GO=1</td>
<td>N: 14,226 $165,595</td>
<td>N: 117,125 $151,054</td>
<td>N: 131,351 $316,649</td>
</tr>
<tr>
<td>GO=0</td>
<td>N: 5,498 $98,798</td>
<td>N: 44,853 $87,332</td>
<td>N: 50,351 $186,130</td>
</tr>
<tr>
<td></td>
<td>19,724 $264,393</td>
<td>161,978 $238,386</td>
<td>181,702 $502,779</td>
</tr>
<tr>
<td>GenPurp=0</td>
<td>State=1</td>
<td>State=0</td>
<td>Total</td>
</tr>
<tr>
<td>GO=1</td>
<td>N: 4,050 $12,272</td>
<td>N: 102,041 $119,006</td>
<td>N: 106,091 $131,277</td>
</tr>
<tr>
<td>GO=0</td>
<td>N: 36,877 $236,679</td>
<td>N: 61,106 $223,143</td>
<td>N: 97,983 $459,822</td>
</tr>
<tr>
<td></td>
<td>40,927 $248,950</td>
<td>163,147 $342,149</td>
<td>204,074 $591,099</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GO=1</td>
<td>N: 18,276 $177,866</td>
<td>N: 219,166 $270,060</td>
<td>N: 237,442 $447,926</td>
</tr>
<tr>
<td>GO=0</td>
<td>N: 42,375 $335,477</td>
<td>N: 105,959 $310,475</td>
<td>N: 148,334 $645,952</td>
</tr>
<tr>
<td></td>
<td>60,651 $513,343</td>
<td>325,125 $580,535</td>
<td>385,776 $1,093,878</td>
</tr>
</tbody>
</table>
Notes: This figure presents GASB 34-related events during our sample period (1998 through 2007). The requirements of GASB 34 are “effective in three phases based on a government’s total annual revenues in the first fiscal year ending after June 15, 1999” (GASB 1999, p.8). The effective date noted on this timeline refers to the date that governments with total annual revenues of $100 million or more (e.g., all state governments and the largest local governments) are required to apply GASB 34. Governments with total annual revenues of $10 million or more (less than $10 million) are required to apply GASB 34 for fiscal years ending after June 15, 2003 (2004).
Figure 2
Debt Characteristics: Annual Averages

Panel A: $Y = \text{NEWDEBTPC}$
Figure 2 (cont.)
Debt Characteristics: Annual Averages

Panel B: Y = ISSUERS
Figure 2 (cont.)
Debt Characteristics: Annual Averages

Panel C: $Y = \text{STATE}\%$
Figure 2 (cont.)
Debt Characteristics: Annual Averages

Panel D: $Y = \text{GENGOV}\%$

![Graph showing the trend of GENGOV% from 1998 to 2007.](image)
Figure 2 (cont.)
Debt Characteristics: Annual Averages

Panel E: \( Y = GO\% \)

Notes: This figure presents debt characteristic means by year during our sample period (1998 through 2007). Variables are defined in Appendix A.
Figure 3
Distributions of Residuals (PRE vs. POST)
Debt characteristic = $f \{\text{STATE FIXED EFFECTS; QTRYEAR FIXED EFFECTS}\}$

Panel A: $Y = \text{NEWDEBTPC}$

<table>
<thead>
<tr>
<th>Moment</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>45.63</td>
<td>84.60</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.98</td>
<td>2.44</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>6.68</td>
<td>12.67</td>
</tr>
</tbody>
</table>
Figure 3 (cont.)

Distributions of Residuals (PRE vs. POST)

\[ Y_{kt} = \beta_0 + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \epsilon_{kt} \]

Panel B: \( Y = \text{ISSUERS} \)

<table>
<thead>
<tr>
<th>Moment</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>9.72</td>
<td>16.05</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.76</td>
<td>2.07</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>6.73</td>
<td>8.17</td>
</tr>
</tbody>
</table>
Figure 3 (cont.)
Distributions of Residuals (PRE vs. POST)

$$Y_{kt} = \beta_0 + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \varepsilon_{kt}$$

Panel C: $Y = \text{STATE\%}$

**PDF**

**CDF**

<table>
<thead>
<tr>
<th>Moment</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>0.32</td>
<td>0.28</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.10</td>
<td>0.02</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.16</td>
<td>2.30</td>
</tr>
</tbody>
</table>
Figure 3 (cont.)

Distributions of Residuals *(PRE vs. POST)*

\[ Y_{kt} = \beta_0 + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \epsilon_{kt} \]

Panel D: \( Y = \text{GENGOV}\% \)

<table>
<thead>
<tr>
<th>Moment</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>0.28</td>
<td>0.28</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.23</td>
<td>0.47</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.49</td>
<td>2.98</td>
</tr>
</tbody>
</table>
Figure 3 (cont.)
Distributions of Residuals (PRE vs. POST)

\[ Y_{kt} = \beta_0 + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \varepsilon_{kt} \]

Panel E: \( Y = \text{GO\%} \)

<table>
<thead>
<tr>
<th>Moment</th>
<th>PRE</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Deviation</td>
<td>0.29</td>
<td>0.26</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.26</td>
<td>0.43</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.46</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Notes: This figure presents the distributions of the residuals (shown separately for the PRE and POST periods) from regressing the specified debt characteristic on state fixed effects and quarter-year fixed effects using 2,000 state quarter-year observations from 1998 through 2007. Note that including quarter-year fixed effects results in the specification yields mean residuals equal to zero for each quarter-year (and thus for each of the PRE and POST time periods). Variables are defined in Appendix A.
### Table 1: Descriptive Statistics

**Panel A: Summary statistics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>P25</th>
<th>P50</th>
<th>P75</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables (N=2,000)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEWDEBTPC</td>
<td>75.377</td>
<td>83.128</td>
<td>22.370</td>
<td>48.782</td>
<td>95.147</td>
</tr>
<tr>
<td>ISSUERS</td>
<td>21.429</td>
<td>25.642</td>
<td>5.000</td>
<td>12.000</td>
<td>28.000</td>
</tr>
<tr>
<td>STATE%</td>
<td>0.430</td>
<td>0.334</td>
<td>0.112</td>
<td>0.405</td>
<td>0.723</td>
</tr>
<tr>
<td>GENGOV%</td>
<td>0.437</td>
<td>0.330</td>
<td>0.135</td>
<td>0.393</td>
<td>0.727</td>
</tr>
<tr>
<td>GO%</td>
<td>0.421</td>
<td>0.320</td>
<td>0.116</td>
<td>0.389</td>
<td>0.689</td>
</tr>
<tr>
<td><strong>Cross-sectional variables (N=50)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAAPREQ</td>
<td>2.140</td>
<td>1.200</td>
<td>1.000</td>
<td>2.000</td>
<td>3.000</td>
</tr>
<tr>
<td>OVERSIGHT</td>
<td>1.220</td>
<td>0.807</td>
<td>1.000</td>
<td>1.000</td>
<td>2.000</td>
</tr>
<tr>
<td>POLSTABILITY</td>
<td>5.440</td>
<td>2.962</td>
<td>3.000</td>
<td>6.000</td>
<td>7.000</td>
</tr>
<tr>
<td>ACCELERATOR</td>
<td>0.440</td>
<td>0.497</td>
<td>0.000</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>DELAYER</td>
<td>0.200</td>
<td>0.400</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
### Table 1 (cont.)
#### Descriptive Statistics

**Panel B: Correlations (dependent variables; N=2,000)**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>NEWDEBTPC</td>
<td>-</td>
<td>0.402</td>
<td>0.211</td>
<td>0.120</td>
</tr>
<tr>
<td>[2]</td>
<td>ISSUERS</td>
<td>0.488</td>
<td>-</td>
<td>-0.126</td>
<td>0.024</td>
</tr>
<tr>
<td>[3]</td>
<td>STATE%</td>
<td>0.313</td>
<td>-0.096</td>
<td>-</td>
<td>0.057</td>
</tr>
<tr>
<td>[4]</td>
<td>GENGOV%</td>
<td>0.188</td>
<td>0.099</td>
<td>0.048</td>
<td>-</td>
</tr>
<tr>
<td>[5]</td>
<td>GO%</td>
<td>0.111</td>
<td>0.175</td>
<td>-0.118</td>
<td>0.493</td>
</tr>
</tbody>
</table>

**Panel C: Correlations (cross-sectional variables; N=50)**

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>GAAPREQ</td>
<td>-</td>
<td>0.092</td>
<td>0.118</td>
<td>0.065</td>
</tr>
<tr>
<td>[2]</td>
<td>OVERSIGHT</td>
<td>0.107</td>
<td>-</td>
<td>0.211</td>
<td>-0.092</td>
</tr>
<tr>
<td>[3]</td>
<td>POLSTABILITY</td>
<td>0.128</td>
<td>0.230</td>
<td>-</td>
<td>0.113</td>
</tr>
<tr>
<td>[4]</td>
<td>ACCELERATOR</td>
<td>0.055</td>
<td>-0.073</td>
<td>0.089</td>
<td>-</td>
</tr>
<tr>
<td>[5]</td>
<td>DELAYER</td>
<td>0.110</td>
<td>0.163</td>
<td>0.077</td>
<td>-0.443</td>
</tr>
</tbody>
</table>

Notes: Panel A presents descriptive statistics. Panels B and C present Spearman (Pearson) correlations below (above) the diagonal; correlations significant at the five percent level or better (two-tailed t-test) are in **bold**. Variables are defined in Appendix A. Continuous variables are winsorized at the 1st and 99th percentiles of raw distributions.
Table 2  
Debt Characteristics: Pre vs. Post-GASB 34

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NEWDEBTPC</td>
<td>ISSUERS</td>
<td>STATE%</td>
<td>GENG0V%</td>
<td>GO%</td>
</tr>
</tbody>
</table>

**Panel A: Debt characteristic = \( a_0 + a_1 \text{(POST)} + \text{STATE FIXED EFFECTS} + \epsilon \)**

\[
\begin{align*}
\text{POST} & : 51.136^{***} & 10.919^{***} & 0.039 & -0.001 & -0.063^{***} \\
(\text{two-tailed significance}) & : (0.000) & (0.001) & (0.112) & (0.959) & (0.003) \\
R^2 & : 0.303 & 0.738 & 0.176 & 0.273 & 0.254
\end{align*}
\]

**Panel B: Debt characteristic = \( b_0 + b_1 \text{(POST)} + b_1 \text{(TIMETREND)} + \text{STATE FIXED EFFECTS} + \epsilon \)**

\[
\begin{align*}
\text{POST} & : 4.654 & 3.405 & 0.050 & -0.006 & -0.021 \\
(\text{two-tailed significance}) & : (0.795) & (0.469) & (0.218) & (0.834) & (0.655) \\
\text{TIMETREND} & : 7.747^{**} & 1.252^{*} & -0.002 & 0.001 & -0.007 \\
(\text{two-tailed significance}) & : (0.017) & (0.065) & (0.755) & (0.865) & (0.326) \\
R^2 & : 0.314 & 0.740 & 0.176 & 0.273 & 0.255
\end{align*}
\]

Notes: Regressions are estimated using 1,600 state quarter-year observations (800 \( \text{POST} = 0 \) observations and 800 \( \text{POST} = 1 \) observations). Standard errors are clustered by state and by quarter-year. Two-tailed significance levels displayed parenthetically. Variables are defined in Appendix A. \( *** \), \( ** \), \( * \) represent a 1, 5, and 10 percent level of significance, respectively (two-tailed tests).
### Table 3

Debt Characteristics: Pre vs. Post-GASB 34 (Cross-Sectional Variation)

Debt characteristic = \( \delta_0 + \delta_1 (POST \times STATE\ PROFILE) + STATE\ FIXED\ EFFECTS + QTRYEAR\ FIXED\ EFFECTS + \varepsilon \)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: X = GAAP requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST*GAAPREQ</td>
<td>4.950</td>
<td>-0.120</td>
<td>0.029</td>
<td>-0.013</td>
<td>-0.028*</td>
</tr>
<tr>
<td>(two-tailed significance)</td>
<td>(0.267)</td>
<td>(0.947)</td>
<td>(0.197)</td>
<td>(0.473)</td>
<td>(0.057)</td>
</tr>
<tr>
<td>R²</td>
<td>0.363</td>
<td>0.760</td>
<td>0.198</td>
<td>0.285</td>
<td>0.277</td>
</tr>
<tr>
<td>Panel B: X = State government oversight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST*OVERSIGHT</td>
<td>10.540*</td>
<td>3.827</td>
<td>0.025</td>
<td>0.039</td>
<td>0.033*</td>
</tr>
<tr>
<td>(two-tailed significance)</td>
<td>(0.087)</td>
<td>(0.306)</td>
<td>(0.447)</td>
<td>(0.212)</td>
<td>(0.081)</td>
</tr>
<tr>
<td>R²</td>
<td>0.364</td>
<td>0.763</td>
<td>0.197</td>
<td>0.286</td>
<td>0.276</td>
</tr>
<tr>
<td>Panel C: X = State government political stability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POST*POLSTABILITY</td>
<td>-2.281</td>
<td>-0.077</td>
<td>-0.003</td>
<td>0.010</td>
<td>0.006</td>
</tr>
<tr>
<td>(two-tailed significance)</td>
<td>(0.213)</td>
<td>(0.942)</td>
<td>(0.793)</td>
<td>(0.175)</td>
<td>(0.390)</td>
</tr>
<tr>
<td>R²</td>
<td>0.364</td>
<td>0.760</td>
<td>0.196</td>
<td>0.286</td>
<td>0.275</td>
</tr>
</tbody>
</table>

Notes: Each regression is estimated using 1,600 state quarter-year observations (800 POST = 0 observations and 800 POST = 1 observations). The subscript \( k (t) \) indexes the state (quarter-year). The POST (state profile) coefficient is subsumed by the quarter-year (state) fixed effects. Standard errors are clustered by state and by quarter-year. Two-tailed significance levels shown parenthetically. Variables are defined in Appendix A. ***, **, * represent a 1, 5, and 10 percent level of significance, respectively (two-tailed tests).
### Table 4
Debt Characteristics Distributional Effects: Pre vs. Post-GASB 34

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolmogorov-Smirnov Test Statistic</td>
<td>0.208***</td>
<td>0.355***</td>
<td>0.065*</td>
<td>0.058</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.068)</td>
<td>(0.142)</td>
<td>(0.220)</td>
</tr>
<tr>
<td>Brown-Forsythe Test Statistic</td>
<td>69.366***</td>
<td>38.270***</td>
<td>15.341***</td>
<td>3.679*</td>
<td>12.248***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.055)</td>
<td>(0.000)</td>
</tr>
</tbody>
</table>

Notes: This table presents test statistics to examine differences between the PRE and POST period distributions of residuals obtained from regressing each debt characteristics on state fixed effects and quarter-year fixed effects using 2,000 state-quarter-year observations from 1998 through 2007. The Kolmogorov-Smirnov two-sample test addresses the null hypothesis that PRE and POST distributions are equivalent. The Brown-Forsythe test addresses the null hypothesis that PRE and POST distributions have equal variances; our test considers whether each debt characteristic has an equal variance in the PRE and POST periods. Two-tailed significance levels are shown parenthetically. Variables are defined in Appendix A. ***, **, * represent a 1, 5, and 10 percent level of significance, respectively (two-tailed tests).
Table 5
New Debt Per Capita: Anticipatory Effects

*NEWDEBTPC* = \( f \) (STATE FIXED EFFECTS; QTRYEAR FIXED EFFECTS)

<table>
<thead>
<tr>
<th></th>
<th>Residual\textsubscript{2000}</th>
<th>Residual\textsubscript{2004}</th>
<th>Residual\textsubscript{2005}</th>
<th>Residual\textsubscript{2008}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative Positive</td>
<td>Negative Positive</td>
<td>Negative Positive</td>
<td>Negative Positive</td>
</tr>
<tr>
<td>1997 vs 2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>17 (13.9)</td>
<td>12 (15.1)</td>
<td>10 (12.8)</td>
<td>14 (13.2)</td>
</tr>
<tr>
<td>Positive</td>
<td>7 (10.1)</td>
<td>14 (10.9)</td>
<td>22 (19.2)</td>
<td>8 (10.8)</td>
</tr>
<tr>
<td>2001 vs 2004</td>
<td>29</td>
<td>20</td>
<td>30</td>
<td>33</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>21</td>
<td></td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>2005 vs 2008</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Negative</td>
<td></td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td></td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

Chi-Square Test Statistic

- Column [1] vs. [2]: 37.930***

Notes: This table shows distributions of the states classified according to signs of residuals for year \( t \) and \( t+3 \) obtained from regressing new debt per capita (*NEWDEBTPC*) on state fixed effects and year fixed effects using 600 state-year observations from 1997 through 2008. Expected cell frequencies given the marginal distributions are shown parenthetically. Chi-squared test statistics compare the 2001 versus 2004 test distribution (Column 2) with counterfactual distributions that compare 1997 versus 2000 (Column 1) and 2005 versus 2008 (Column 3). Variables are defined in Appendix A. ***, **, * represent a 1, 5, and 10 percent level of significance, respectively (two-tailed tests).
Table 6
State-level Debt Characteristics: Cross-Sectional Variation in Main Effects as a Function of Anticipatory Effects

\[ \text{Debt characteristic} = \mu_0 + \mu_1 (\text{POST} \times \text{DELAYER}) + \mu_2 (\text{POST} \times \text{ACCELERATOR}) + \text{STATE FIXED EFFECTS} + \text{QTRYEAR FIXED EFFECTS} + \varepsilon \]

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NEWDEBTPC</td>
<td>ISSUERS</td>
<td>STATE%</td>
<td>GENGOV%</td>
<td>GO%</td>
</tr>
<tr>
<td>POST*ACCELERATOR</td>
<td>-22.076*</td>
<td>-9.702**</td>
<td>0.088</td>
<td>0.029</td>
<td>-0.040</td>
</tr>
<tr>
<td></td>
<td>(0.090)</td>
<td>(0.044)</td>
<td>(0.156)</td>
<td>(0.548)</td>
<td>(0.425)</td>
</tr>
<tr>
<td>POST*DELAYER</td>
<td>39.041**</td>
<td>13.272</td>
<td>-0.020</td>
<td>0.159**</td>
<td>0.052</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.162)</td>
<td>(0.779)</td>
<td>(0.024)</td>
<td>(0.323)</td>
</tr>
<tr>
<td>F-Statistic (\mu_1 = \mu_2)</td>
<td>20.69***</td>
<td>7.17**</td>
<td>2.16</td>
<td>5.52**</td>
<td>4.08*</td>
</tr>
<tr>
<td>R^2</td>
<td>0.404</td>
<td>0.783</td>
<td>0.212</td>
<td>0.288</td>
<td>0.295</td>
</tr>
</tbody>
</table>

Notes: Regression are estimated using 1,200 state quarter-year observations (600 POST = 0 observations and 600 POST = 1 observations). Observations from 2001 and 2004 are used to identify accelerators and delayers, so these years are excluded from the sample used to estimate specification [5] as to not induce a mechanical relation. Standard errors are clustered by state and by quarter-year. Two-tailed significance levels are displayed parenthetically. Variables are defined in Appendix A. ***, **, * represent a 1, 5, and 10 percent level of significance, respectively (two-tailed tests).