Changes in Public Policy and the Cost of Debt: Tax Increment Financing and the State of California's Elimination of Redevelopment Agencies

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In 2011, the state of California eliminated redevelopment agencies (RDAs), placing in jeopardy tax increment financing (TIF) debt and the future of own-source local government tax-based debt financing. This paper provides an analysis of the elimination and restructuring of TIF debt in California. It finds evidence of a positive market reaction to California's RDA policy reforms and restructuring of the TIF sector. After a period of uncertainty, reform led to lower debt costs and lower capital project costs. The successful restructuring in California provides lessons for governments considering reforms to TIF programs and local own-source tax-based debt financing in general.

INTRODUCTION

In the United States of America, much of the responsibility for maintaining and improving the physical infrastructure falls on state and local (subnational) governments. Local governments in the United States get assistance in the form of intergovernmental loans and grants from their state or the federal government for physical infrastructure expenditures. But unlike many local governments around the world, local governments in the United States have access and control over

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a substantial amount of their own resources. Local governments often use their own resources to finance local capital improvement projects, particularly large capital projects that improve the physical infrastructure and support economic development.

Across the United States, one of the most widely used own-source local government financing techniques is tax increment financing (TIF), and there is TIF-enabling legislation on the books in 49 states (the exception being Arizona). TIF began in the 1950s as an economic redevelopment financing tool to improve blighted areas in the state of California, and it is now widely used across the nation for many local financing purposes. TIF has always financed commercial, industrial, and residential economic development and redevelopment projects, but it now also finances the entire physical infrastructure grid of the modern American city—power utilities, water and wastewater treatment supply and distribution systems, surface and air transportation facilities, educational facilities, affordable housing, and brownfield remediation and redevelopment.

State governments are responsible for passing authorizing TIF legislation, establishing for local governments the enabling and regulatory framework for TIF within the state. But TIF projects are primarily financed with the own-source resources of local governments, not with state or federal revenues. Merriman (2018) estimates that there are 15,785 TIF districts across the United States. TIF districts (TIDs) are special taxing districts within a definitive geographic location, usually a section of a city such as an industrial park or downtown business or cultural district. TIDs are established with the mission of providing local resources, mostly property-tax-based resources, to support local development projects. The development is paid for with the property tax revenues generated by the appreciation in real estate values in the TID from the new development.[1] TIF leverages expected local property tax resources to finance development.

TIF debt is commonly sold to finance development expenditures based on the expectation that the development will generate enough new local property tax revenues to pay the debt service on the new debt. Debt financing is an essential element in facilitating major capital infrastructure and economic development projects sponsored by local governments in the United States. Financing costs are thus a critical factor in determining the net benefits of any capital project, and the ultimate cost to taxpayers and ratepayers.

Public policy changes at the state level, although well intended, can have a negative effect on the ability of local governments to raise funds by increasing the associated cost. Access to the capital market at reasonable cost is essential to taxpayers. Therefore, public policies should not unnecessarily increase borrowing costs to local debt issuers by increasing the default risk associated with their debt issues.

TIF debt repayment is subject to several significant risks. Like any project-based debt instrument, project revenues may prove insufficient to cover debt service costs. Although all TIF projects have risks, it is exceedingly rare for a TIF debt

[1] For more detailed explanations of how the TIF process works, see Johnson and Kriz (2019) and Merriman (2018).

service payment to not be paid in full and on time. On the contrary, and unlike most project-based repayment mechanisms, TIF districts are sometimes viewed as being too successful at generating revenues and building up substantial reserves, which has caused recurring problems throughout the nation with overlapping taxing districts, such as schools. It is not uncommon for TIF districts to have revenue growth well beyond their overlapping taxing districts, and this has resulted in political pressure being placed on TIF districts to reallocate their revenues or go out of business altogether. This is what happened in California.

An additional issue in California was that the state government was required to replace local school district property tax dollars lost to redevelopment authorities. Therefore, although there were plenty of funds in TIF districts to pay TIF debt service, the intergovernmental friction between redevelopment authorities and overlapping taxing districts and the state government put the entire sector of outstanding TIF debt at risk. This situation is not as uncommon as it may seem at first glance. TIF districts have traditionally been structured to receive tax revenue flows that would otherwise have gone to overlapping taxing districts.[2]

THIS STUDY

This paper provides an analysis of a situation whereby the ability of local governments throughout the state of California to access the capital market to finance their own capital projects was jeopardized by state-level public policy reforms. Our analysis also provides lessons for how local development policies can be restructured after adverse policy changes in order to regain and even strengthen capital market access. We analyze the impact of the policy reforms on the cost of financing in the municipal market, and we use the efficient markets hypothesis to test the market's reaction to changes in public policy that may increase the risk associated with debt securities. We also analyze pricing changes following subsequent policy and administrative changes that are expected to reduce the risk of debt securities. Our analysis provides insights on the types of specific policy changes necessary to strengthen the pricing of debt after negative policy announcements.

Applying the efficient market hypothesis, we expect that any major public policy changes that are interpreted by the financial market as significantly weakening the local agencies responsible for repaying debt will be viewed as a negative event by the market. Such a negative event will increase the risk associated with tax-based redevelopment debt by potential investors, which will be reflected in higher yields on future tax-based redevelopment debt relative to other forms of tax-based debt. Holding everything else constant, any future positive changes in the relative pricing of TIF debt are expected to be a result of new information that the market interprets as strengthening the repayment of TIF debt relative to other forms of debt.

Using this framework, we analyze public policy reforms and capital financing changes in California from 2005 to 2018. Specifically, we analyze the impact of redevelopment policy changes on TIF debt relative to other special tax debt,

[2] Of course, this assumes that such revenues would have occurred without the TIF development in the first place.

highlighting the restructuring of redevelopment and TIF policy and practices in California. Our analysis provides insights for states and localities in restructuring their redevelopment policies in the future, and more broadly, their special tax debt security policies. TIF has been in existence for a long time but is not without substantial controversy. Lawmakers across the nation are regularly reforming TIF laws to adapt to the new political, economic, demographic, and fiscal realities states and local communities face. Indeed, the inherent flexibility of TIF is one of the most important factors leading to its longevity. Our analysis and findings will help policymakers make more informed redevelopment organizational and financing decisions, as well as more informed capital market financing decisions in general.

California provides a unique test case because TIF was completely eliminated in the state after extensive use. Because the policy change affected only one type of municipal debt in California, other types of securities potentially form a natural control group against which to test for the effects of the policy change. Using a sample of California municipal bonds sold in the primary market from 2005 to 2018, we use two-way fixed effects regressions to analyze changes in the borrowing costs of TIF debt relative to debt secured by other special taxes before, during, and after the elimination of RDAs and TIF.

We analyze the change in the cost of financing redevelopment over three time periods: (1) the period prior to the elimination of redevelopment agencies (RDAs), which effectively eliminated new TIF projects in California; (2) the assumption of RDA affairs by successor agencies (SAs); and (3) those agencies' subsequent refinancing of outstanding TIF debt. We also briefly describe the restructuring and beginning of a new redevelopment sector with enabling legislation for Enhanced Infrastructure Financing Districts (EIFDs), effectively bringing back new TIF redevelopment. We analyze several specific questions: Is there empirical evidence that California's policy changes affected the pricing of primary market TIF debt? If so, how have the changes affected the cost of financing the development/redevelopment infrastructure in California compared to other forms of special tax financing? Which reforms have had a negative effect and which reforms have had a positive effect on debt pricing? Finally, what are the implications for other state and local governments when considering TIF reforms specifically, and special tax capital financing policy changes generally?

As a preview of our results, we find a significant spike in TIF borrowing costs relative to other debt in 2011, the year in which the bill was proposed and signed into law but before its constitutionality was established by the court and the policy enacted. Beginning in 2013, however, as outstanding TIF bonds were being refunded by SAs, we find that issues backed by TIF have lower average borrowing costs than those backed by other special taxes. We interpret the change to be evidence that after a period of intense uncertainty, investors' perception of the level of risk on TIF debt subsided. We attribute this change to the fact that the restructuring legislation and subsequent implementation practices were successful at alleviating significant market uncertainty regarding the risk of TIF debt. We describe and analyze specific risk-reducing mechanisms in the remainder of the paper.

In the following section, we provide background information on the practice of local government redevelopment in California, focusing on TIF policy issues

leading up to the 2011 reforms and the specific changes in the 2011 legislation affecting TIF debt. Next, we describe the relevant scholarly literature on TIF. Then we describe our empirical methodology, describing our data, hypotheses, test and control variables, and econometric techniques. We then discuss our results and conclude.

TAX INCREMENT FINANCING IN CALIFORNIA

TIF enjoyed tremendous growth for over half a century until the state of California abandoned it in 2012 (Horiuchi and Chapman, 2019; Lefcoe and Swenson, 2014; Swenson, 2015). TIF districts came under substantial pressure during the financial crisis and Great Recession, and perhaps no place was the pressure greater than in California. With the state's economy suffering significant damage from the Great Recession and state and local governments in dire fiscal circumstances, Governor Brown called a special legislative session on January 20, 2011, calling the crisis facing the state a "fiscal emergency." The special session produced Assembly Bill No. 26 (2011), dissolving RDAs throughout the state and effectively eliminating TIF in California. RDAs were local government organizations with special taxing district revenue-raising powers and broad responsibility for carrying out local government planning, administration, financing and development policies.

Assembly Bill No. 26 (2011) was approved by the governor on June 29, 2011, and then incorporated into the governor's proposed FY2011–2012 budget (California Legislative Analyst's Office, 2011). It is important to note that the bill prohibited agencies from incurring new debt and provided for the continued repayment of outstanding bonds. Nevertheless, the municipal securities market was shrouded with uncertainty over future debt service payments on all TIF bonds in California, which accounted for the largest amount of TIF debt in the nation. The constitutionality of Assembly Bill No. 26 was challenged in the California Supreme Court case *California Redevelopment Association et al. v. Matosantos* (2011). On December 29, 2011, the Court upheld the constitutionality of the law and the process of eliminating RDAs and TIF as economic redevelopment/development tools in California began in earnest.

TIF districts and their operating agencies, RDAs, were controversial in California for several reasons. RDAs had expanded substantially throughout the state and increasingly shifted property taxes from services provided to schools, counties, special districts, and cities to their own uses. RDAs were a non-elected governmental entity, yet they controlled a substantial amount of property tax revenue in the state, reaching a high of 12% in 2008 (Horiuchi and Chapman, 2019). Second, RDAs caused a particular problem for state government around the funding of K-14 districts (K-12 schools and community colleges). Basically, revenue that K-14 districts would have received from local property taxes, but that was instead diverted to RDAs, had to be backfilled by the state under California's school finance laws.[3] The California replacement mechanism placed a substantial fiscal

[3] In 24 states, overlapping taxing districts are either directly excluded by law or may choose to be excluded from the TIF district. But in only five states are overlapping districts even partially reimbursed for their TIF losses. See Kriz and Johnson (2019) for a review of TIF laws across states.

burden on the state government, especially during a downturn in state tax revenue. The California Legislative Analyst's Office (2011) estimated that the total annual loss from RDAs was $3.5 billion (net of pass-through payments4), $2 billion of which was diverted from K-14 district property taxes.

A related complaint by the state government was that while the state was bearing a substantial burden from such funding, RDAs were providing no statewide fiscal or economic benefit. Although individual communities may have benefited from a new TIF project, the state argued, RDAs were simply moving capital spending from one community to another, providing no net benefit to the state (California Legislative Analyst's Office, 2011). Whether accurate or not, these concerns helped lead to the dissolution of all RDAs in California and placed in jeopardy the future repayment of the entire sector of outstanding California TIF bonds.

Although some TIF capital expenditures are on a pay-as-you-go basis, debt has proven to be the way most large TIF projects are financed. The sale of bonds can raise substantial upfront funds to pay for TIF capital project costs. The exact size of the bond issue and structure of the debt service schedule is based on the expected incremental revenues generated by the TIF project in the TIF district. It is not uncommon for TIF bond issues to raise tens to hundreds of millions of dollars. Once the capital project is complete and generating revenue, the debt is serviced by the incremental property tax revenues from the TIF district, just as future revenues are used to pay debt service on a typical capital project financed with revenue bonds (Luby, Moldogaziev, Johnson, and Winecoff, 2019).

California RDAs were spending a lot of money and were heavily debt-laden. In FY2011, the fiscal year prior to their dissolution, 427 RDAs spent over $10.4 billion (Chiang, 2012; Horiuchi and Chapman, 2019). At $1.8 billion, long-term principal payments were the largest single RDA expenditure (Chiang, 2012). Outstanding TIF debt accounted for $20.77 billion of $30 billion of long-term outstanding RDA debt in FY2011 (Chiang, 2012).

Successor Agencies

California created successor agencies (SAs) as new operational entities to succeed RDAs. SAs created a new intergovernmental administrative structure for existing TIF districts. The legislature gave them the mandate to "expeditiously" wind down the financial affairs of RDAs. To wind down RDA obligations, SAs were required to create and administer a Redevelopment Obligation Retirement Fund, and oversight boards were established to review the actions of SAs. Oversight boards consist of seven members who represent, respectively, the county, the city that formed the RDA, the largest special district by property tax share whose jurisdiction overlaps with the TIF district, K-12 school districts, community college districts, the public, and the employees of the former RDA (Assembly Bill No. 1484, 2012).

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[4] Pass-through arrangements required contractual payments made by the RDA to the overlapping government. They were intended to provide a negotiated arrangement where RDAs and overlapping districts shared more proportionately in the net revenue benefits from development.

Upon the dissolution of RDAs, the tax increment was eliminated. Such property taxes would no longer be considered incremental taxes and allocated as such. They would now be "deemed property tax revenues and allocated first to SAs to make payments on the indebtedness incurred by the dissolved redevelopment agencies, with the remaining balances allocated in accordance with applicable constitutional and statutory provisions" (Assembly Bill No. 26, Section 1(i), 2011). This last clause was designed to make more property tax revenue available to overlapping taxing districts, cities, counties, special districts, and school and community college districts, whose representatives compose the SAs' oversight board. Property tax revenues that would have gone to former RDAs as tax increment revenue are now deposited into a county Redevelopment Property Tax Trust Fund, administered by the county auditor-controller. The revenues in the trust fund are to be used to fund "specified expenses" of the former RDA, with any remainder allocated to the taxing entities throughout the county.

SAs are required to continue making payments on the outstanding TIF debt of former RDAs. Such required payments are termed enforceable obligations and must be included in the enforceable obligation payment schedule. Enforceable obligations include "required debt service, reserve set-asides and any other payments required under the indenture . . . of the outstanding bonds" (Assembly Bill No. 26 Section 34167 (d)(1); (h), 2011). Unlike RDAs, SAs are not allowed to build up substantial reserves. Property tax allocations to the SAs are capped at debt service coverage plus indenture-based reserve requirements; surplus funds are allocated to other taxing entities. This does enable—indeed require—SAs to continue paying debt service on outstanding TIF bonds.

The new SA structure, once fully implemented and understood, may add additional security to outstanding TIF bonds. Revenues previously deemed tax increment are now sent to SA trust funds, and the assets and unallocated fund balances and reserves of the RDAs are transferred to the SAs and dedicated to debt service on outstanding debt. Moreover, according to the California Department of Finance (2018), "the 20-percent housing set-aside is no longer made and only those funds necessary to service housing bond debt and other enforceable housing obligations will be designated for housing purposes. The remainder will be available for debt service on other bonds" (California Department of Finance, 2018). In other words, rather than a diminution of sources of repayment on outstanding obligations, SAs likely have greater resources than the RDAs they replaced, all of which are dedicated to repayment. Also importantly, SAs are prohibited from taking on new TIF obligations, substantially reducing the likelihood of the dilution of the repayment security of outstanding TIF debt. SAs are authorized to refinance outstanding TIF bonds subject to their oversight boards' approval and under certain conditions—that is, debt service may not be accelerated, variable rate debt may not be used, total interest cost to maturity and principal amount of the refunding bonds may not exceed that of the bonds to be refunded, and the SA must make use of an independent financial advisor (Assembly Bill No. 1484, 2012).

Enhanced Infrastructure Financing Districts

While the dissolution of RDAs effectively prohibited any new TIF projects, it did not eliminate the demand for the financing of local economic development projects in California, particularly using property tax resources under the control of local communities. As a consequence, in 2014, the state of California created EIFDs, effectively ushering in a new era of TIF in California.

In 2014, the state of California gave EIFDs the ability to issue TIF debt, but with several significant changes to the strength of the repayment pledge. First, this new version of RDAs and TIF eliminates the problem of K-14 property tax revenue losses directly by legally excluding the property tax base of schools from the TIF district, thus eliminating the state budget requirement to backfill such funds. Second, without explicit agreement from the overlapping taxing districts, the EIFD is entitled to collect only the sponsoring jurisdiction's share of property taxes. An EIFD formed by a city, as an example, has a right to only its own share of the increment. Overlapping taxing districts (e.g., the county, special districts) are not forced to give up a portion of their property tax to the TIF project. Now, only if they choose to opt in will their increment be used to support TIF debt (Horiuchi and Chapman, 2019). This may have a significant effect on the level of repayment security supporting TIF projects financed in EIFDs.[5] It may weaken repayment security if overlapping governments systematically choose to not opt into repaying TIF debt service. If they do opt in, however, it may strengthen the sector with greater transparency and eliminate willingness-to-pay concerns, especially when project revenues come in lower than expected and adequate debt service coverage is placed in jeopardy. Bond issues by EIFDs have so far been limited, with none appearing in our data over the study period.

LITERATURE REVIEW

Several studies in the past have analyzed the impact of major economic events on bond yields such as the effect of the New York City default (Forbes and Petersen, 1975; Gramlich, 1976; Kidwell and Trzinka, 1979, 1982, 1983). These studies analyzed whether a major economic event led to a significant and fundamental change in the structure of municipal market interest rates, or if the change in rates was temporary, with rates slowly returning to pre-crisis levels. In theory, events that negatively affect the likelihood of repayment should have a negative effect on individual bond yields and may affect the structure of interest rates throughout the municipal market (Forbes and Petersen, 1975; Gramlich, 1976).

Several studies find results consistent with the efficient bond market hypothesis, whereby the major event did not provide a permanent structural change to the risk structure of interest rates (Kidwell and Trzinka, 1979, 1982, 1983). Other studies

[5] EIFDs also provide different features regarding voter approval in forming a TIF district formation and issuing bonds. No direct voter approval is required to form an EIFD, only the approval of the affected taxing entities (this does not include school districts, which are prohibited from participating) and TIF bonds can be issued with the approval of 55% of the district's voters (California Government Code).

reject the null hypothesis of no structural change. They find evidence of a fundamental and long-lasting interest rate change. Therefore, they find no evidence of bond market efficiency (Forbes and Petersen, 1975**;** Gramlich, 1976).

In our case, we examine the level of efficiency in local government bonds from a major announcement that fundamentally challenges debt repayment perceptions held by investors, and the impact of the subsequent steps government officials take to shore up the market. In an efficient market, public policy announcements that provide new information to risk-averse, wealth-maximizing investors should affect interest rates. Our empirical analysis draws from several research studies that analyze local government bond yields (Capeci, 1991, 1994) and local government borrowing costs using California data on local general governments and special districts using state of California data (Marlowe, 2009; Guzman and Moldogaziev, 2012; Moldogaziev, Kioko, and Hildreth, 2017; Ivonchyk, 2019).

Several studies focus on the debt financing aspects of TIF (Bae and Damnjanovic, 2018; Geheb, 2009; Luby and Moldogaziev, 2014; Youngman, 2011). Luby and Moldogaziev (2014) provide a descriptive exploration of the TIF debt market from 2000 to 2013, focusing on the impact of the Great Recession. They find that the Great Recession limited how local governments sold and structured TIF debt. Our study expands upon their work by examining the subsequent pricing changes on TIF and other local government debt.

Johnson (1999) is the only study that empirically analyzes the pricing of TIF debt. After providing a description of the development of the TIF debt market in the 1990s, Johnson (1999) estimates a two-equation econometric model focusing on the impact of project factors on credit ratings and true interest cost (TIC). The credit ratings model estimates the impact of TIF bond issue characteristics and tax increment district (TID) project factors[6] on TIF bond credit ratings. The TIC model estimates the impact of TID project factors, along with credit ratings, and market and bond issue variables on a TIF bond issue's interest cost. Johnson (1999) finds that a higher TIF credit rating is associated with a stronger incremental property tax base, more revenue being passed-through, and larger bond issues with a longer final maturity date. Higher interest cost is associated with TIF bond issues that have a lower credit rating (a nonrated bond being the most expensive), have a higher debt-to-assessed value ratio, and are sold by negotiated underwriting.

TIF debt is often viewed as a "hybrid" instrument with a combination of unlimited general obligation bond and limited liability bond features. Although TIF debt is a limited liability debt instrument, it is often viewed as similar to a local general obligation (GO) bond because debt service is ultimately paid from local property taxes, and the support of the affiliated general government may ultimately be relied on to bail out a problem TIF debt issue. This is often referred to as a "moral" obligation. But TIF debt is not GO debt.

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[6] TID project factors include the incremental assessed value of the project area; the percentage of revenue passed through from redevelopment agencies to overlapping taxing units; the debt-to-assessed value ratio of the project area; the amount of vacant, undeveloped land; the type of development (residential, commercial, or industrial); and the size of the project area (see Johnson, 1999).

Like a revenue bond, a TIF bond issue usually represents a limited liability of a non-general governmental (special district or public authority, for example) issuer, and the debt service is usually paid from a dedicated revenue source, with full and timely payment a function of sufficient revenue being generated from the project being financed. TIF debt is special tax debt with the money to pay debt service coming from incremental property taxes usually controlled by a special taxing district.

Geheb (2009) analyzes how state courts have interpreted the constitutionality of TIF debt under several traditional legal doctrines for determining the constitutionality of debt: public authority, special fund, moral obligation, and non-appropriation legal doctrines. These doctrines have been used to distinguish a "debt" liability from a "current" liability, and general obligation from revenue debt. In the first case of a current versus long-term liability, if the TIF debt issue is considered a current obligation, rather than a debt (i.e., long-term) obligation, the TIF issue is often able to circumvent the more stringent laws and regulations associated with issuing a local tax-backed debt obligation. Similarly, if considered a debt issue, but a form of revenue rather than general obligation debt, fewer restrictions are commonly placed on issuing TIF debt.

Another strand of the literature covers the use of TIF as an alternative financing mechanism. Weber (2010) and Pacewicz (2016) analyze TIF as a means of urban financialization policy. Pacewicz (2016) explores TIF as a tool that furthers the politics of earmarking, arguing that TIF provides an advantageous revenue stream because it is a way to earmark revenue streams away from other taxing bodies (Pacewicz, 2016). Often, TIF reform efforts are a way for overlapping taxing districts to regain control over those earmarked revenue streams.

Weber (2010) analyzes TIF as a tool of urban financialization policy where the asset value of the expected increase in real estate value is "monetized" by selling TIF debt and using the proceeds to pay for capital expenditures. The TIF debt instrument represents an urbanized financialization policy by integrating global financial markets and local urban policies. According to Weber, TIF allows municipalities to bundle and sell off the rights to future property tax revenues from designated parts of the city (Weber, 2010). One important aspect of the "financialization" strand of TIF research is that it demonstrates how the use of TIF has grown from a narrow redevelopment tool to a fundamental strategic component of how many local governments broadly operate, finance, and allocate basic governmental resources. Although neither Weber (2010) nor Pacewicz (2016) address the question of TIF debt's "hybrid" nature, their perspectives support the notion that the incremental property tax that secures TIF debt is a distinct revenue stream to be viewed differently than that which secures GO debt.

This paper extends the literature in several important ways. Based on our review of the scholarly literature, we find no publication that has empirically analyzed a major redevelopment policy change in a state where TIF has been eliminated statewide. Also, TIF was practically ubiquitous as a local government redevelopment in California. Our paper provides an empirical analysis of the financing costs of eliminating such a widely used program, and the costs and benefits of reforming and restructuring locally initiated, but state-enabled, redevelopment policy throughout a state. We also add to the efficient markets literature by examining the effect of

a major policy reform on bond pricing in the municipal market, specifically pricing changes on TIF debt and other local government debt, and the specific types of reforms that can subsequently lead to market stability. In the next section, we develop our empirical approach to analyzing TIF and special tax debt borrowing costs before, during and after the elimination of TIF in 2012.

STUDY HYPOTHESIS AND DATA

This section analyzes the impact of changes in California RDA policy on the pricing of TIF bonds in California from 2005 to 2018. TIF debt has been the basic financing instrument used to implement RDA policy in California, and the cost of TIF debt is often the primary determinant in the financing costs of redevelopment projects. We provide an analysis of the true interest cost (TIC) of TIF debt relative to debt secured by special assessments and special tax revenues prior to the announcement of the elimination of RDAs in 2011 and in the following period. We analyze the basic question: Is there empirical evidence that California's RDA policy changes affected the pricing of primary market TIF debt? The null hypothesis is no difference in the pricing of TIF debt before, during, and after redevelopment policy reforms in 2011. A more realistic hypothesis, however, would postulate that TIF debt would incur a penalty leading up to and during the policy changes. The next question should be: After the initial upheaval, did TIF debt prices stabilize relative to other forms of debt? The answer to this question provides evidence on the effectiveness and efficiency of the restructuring of the sector of TIF debt.

We use data from the California Debt and Investment Advisory Commission (CDIAC) on bonds issued in California from 2005 to 2018. During this period 40,077 issues of municipal securities were sold that appear in the data. We omit from the sample issues for which the final maturity date is missing or the TIC is missing,[7] issues of less than three years to final maturity, and bonds issued for the purpose of either commercial energy conservation improvements or residential energy conservation improvements.[8] Finally, we limit the sample to bonds backed by TIF revenues, special assessments, and special tax revenues. For the remainder of this article, we will group securities backed by special assessments and special tax revenues together, unless otherwise noted, and refer to them simply as "special tax issues."[9] Our reason for omitting other types of securities is that the average TIC for TIF versus special tax issues was following the same trend over time in the

[7] Data on the TIC variable is self-reported by debt issuers to the CDIAC.

[8] Bonds issued for energy conservation improvements are small, privately placed bonds that facilitate household and firm investment in a wide range of products and renovation projects intended to reduce energy consumption. They are repaid by special property tax assessments on participating households and firms. Their purpose is distinct from most municipal debt issuances, and their inclusion would distort our analysis of the bulk of capital raised in the California municipal debt market.

[9] We realize that a tax and an assessment are similar but not identical. For our empirical estimations, we believe combining them is appropriate because in California, special assessments, special taxes, and tax increments are all local, mandatory levies used to finance the same types of projects. The major differences between TIF and special assessment financing is that the special assessment represents a direct lien on the property, and a tax increment does not, and there is no such entity as a special assessment district.

period prior to the policy change, whereas debt secured by other sources of revenue was not. TIF debt and special tax debt are both limited-liability, tax-backed securities, unlike the bonds we exclude from our analysis,[10] and are likely to be viewed by investors as having a similar risk profile. Furthermore, as discussed below, having common trends in the outcome variable prior to the policy change is an important condition of our identification strategy. Our analysis sample consists of 2,444 issues of municipal securities from 2005 to 2018, 38% of which were TIF. Table 1 shows descriptive statistics for the analysis sample.

Table 1: Summary Statistics

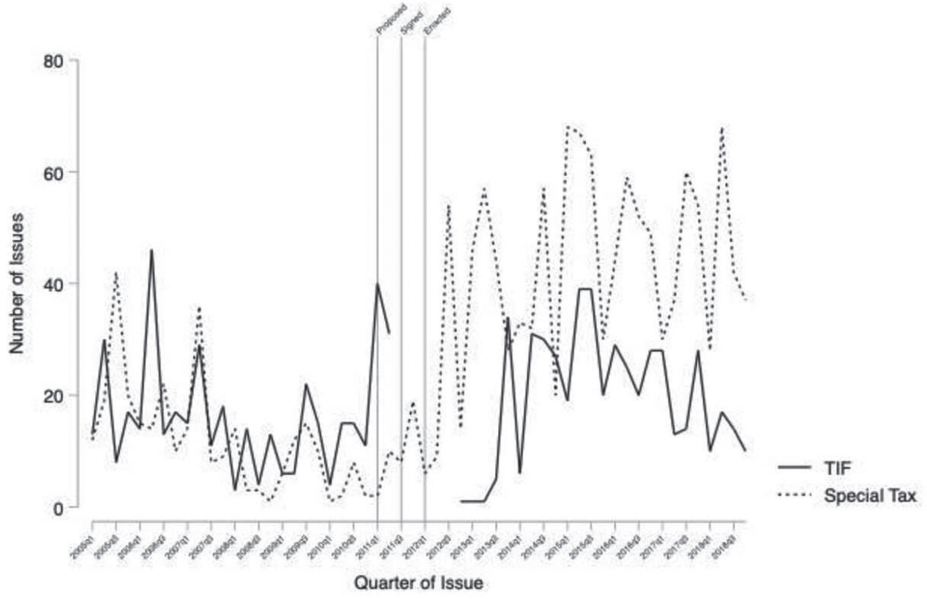
Variables	N	Mean	SD	Min	Max
TIC rate, basis points	2,444	444	139	111	1,200
Principal amount, millions	2,444	15.40	24.70	0.011	252
Years to call or maturity	2,444	8.69	5.16	0	40.3
Weekly Bond Buyer 20 Index	2,444	4.00	0.51	2.80	5.85
TIF	2,444	0.38	0.48	0	1
Special tax	2,444	0.50	0.50	0	1
Special assessment	2,444	0.12	0.33	0	1
Refunding	2,444	0.58	0.49	0	1
Highest rating is prime	2,444	0.059	0.24	0	1
Highest rating is high grade	2,444	0.21	0.40	0	1
Highest rating is upper medium grade	2,444	0.053	0.22	0	1
Highest rating is lower medium grade	2,444	0.027	0.16	0	1
Not rated	2,444	0.65	0.48	0	1
Split ratings	2,444	0.018	0.13	0	1
Has two ratings	2,444	0.055	0.23	0	1
Has three ratings	2,444	0.0065	0.081	0	1
Federally tax exempt	2,444	0.83	0.38	0	1
Subject to AMT	2,444	0.00082	0.029	0	1
Federally taxable	2,444	0.17	0.38	0	1
Competitive	2,444	0.030	0.17	0	1
Negotiated	2,444	0.84	0.36	0	1
Private placement	2,444	0.13	0.33	0	1
Guaranteed	2,444	0.29	0.45	0	1
Has a financial advisor	2,444	0.83	0.38	0	1

Sources: California Debt and Investment Advisory Commission and Thomson Reuters/The Bond Buyer.

[10] Over 50% of excluded securities are general obligation, 15% are certificates of participation, 13% are public enterprise revenue bonds, with the remaining 22% representing a variety of securities.

Figure 1 shows the number of TIF and special tax issues before and after three policy moments: (1) when Governor Brown proposed the bill in January 2011; (2) when he signed the bill in June 2011, and (3) when the bill was enacted at the very end of that year. Although the state of California opened the door to new TIF bonds by enabling EIFDs in 2014, none of the TIF bonds in our data is identified as EIFD-issued debt.[11] Rather, after no TIF debt was issued from the second quarter of calendar year 2011 through the second quarter of calendar year 2012, TIF bonds slowly begin to be issued again, but by SAs. In the first and second quarters of 2011, after Governor Brown had proposed eliminating RDAs but before the bill was approved and signed, the number of TIF issuances increased sharply while special tax issues remained steady, particularly relative to the several years just prior, during the financial crisis and recession. We interpret this as a rush to market by TIF districts which, in absence of the policy change, might have issued at a later date. Then, of course, there is the period between when the law was signed and when it was enacted. During this period, RDAs were prohibited from issuing, but SAs had yet to be established because of the legal challenges to the law. After their constitutionality was established in late 2011, SAs were established and quickly began issuing bonds; during this period, special tax issues increased in frequency.

Figure 1: TIF and Special Tax Issues by Quarter of Issue



[11] We note that there are several EIFD-funded projects working their way through the investment pipeline. Therefore, we expect EIFD-backed TIF bonds will be sold eventually in the primary market.

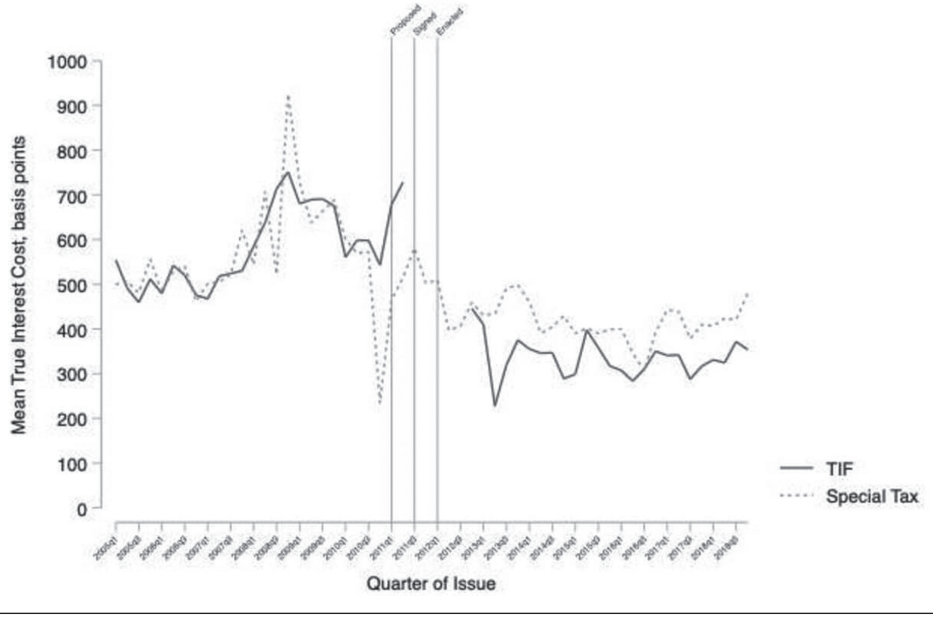
Methodology

Because the law change only affected RDA-issued TIF debt, other types of bonds serve as a natural comparison group, and we pursue a generalized difference-in-differences (DID) research design with standard errors clustered at the issuer level. The DID research design assumes that unmeasured confounding variation is limited in form to two types: time invariant group attributes and factors that vary over time but commonly to all groups. In combination, this means that any difference between the treatment and control group in the observed outcome variable remains constant over time, prior to treatment. Therefore, differences between the groups post-treatment can be attributed to the policy change—in this case, the elimination of RDAs and subsequent policy decisions.

We include quarterly fixed effects to control for time-varying factors that affect both TIF debt and other types of debt, and we include a fixed effect for whether the bond was backed by tax increment or by special taxes to control for time-invariant differences between types of repayment pledges. Therefore, the primary variable of interest provides an estimate of the effect of the policy change on the cost of TIF debt relative to special tax issues.

The critical assumption of the DID research design is that prior to the law change, TIF debt and its comparison group have parallel trends in the outcome variable. Figure 2 shows the average TIC for bond issues backed by tax increment and for bond issues backed by special tax over the study period. Average TIC followed a roughly similar trend prior to the announcement of the policy change, although special tax issues exhibit more noise. The figure shows a spike in interest costs for TIF bonds in the first quarter of 2011, when Governor Brown had

Figure 2: Mean True Interest Cost, TIF and Special Tax Issues

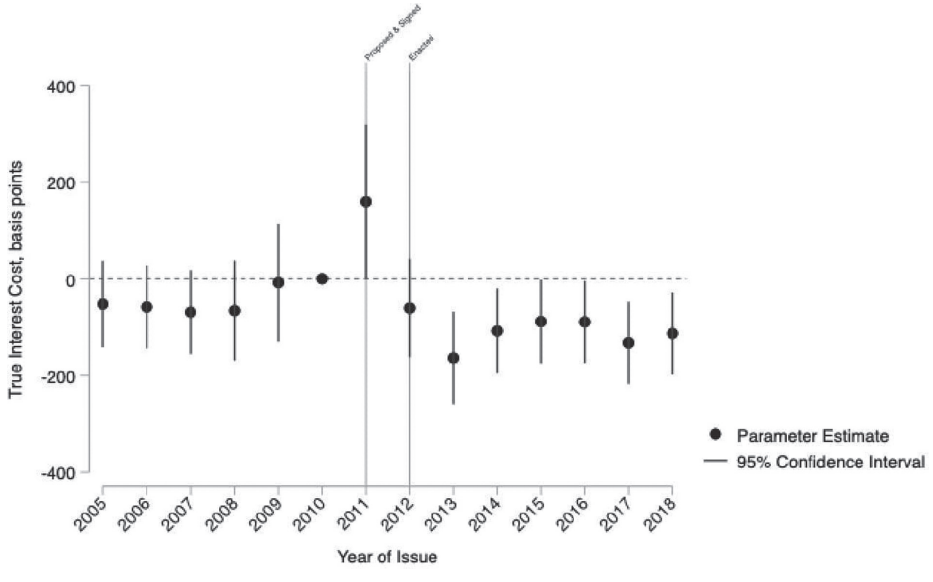


proposed the elimination of RDAs and TIF but before the bill had been signed into law. We argue that this is due to uncertainty regarding the future of RDAs and TIF and the rush to market for new money TIFs that can be seen in Figure 1 during the same quarter. The policy uncertainty may have prompted RDAs to issue TIF bonds earlier than previously planned, selling into a highly uncertain and costly market environment.

In order to statistically test the pre-treatment parallel trends assumption of our research design, we use an event study to compare the TIC, in basis points, of TIF issues to special tax issues. We define indicator variables for whether an issue is backed by TIF for each of the years in our study period. The comparison group against which each indicator variable is measured comprises all issues backed by special tax and all issues backed by either TIF or special tax in the year 2010. Event studies most commonly exclude the period just prior to the treatment. However, in this context, although the policy was not enacted until 2012, we see indications of an anticipatory response to the policy beginning in 2011. Therefore, we consider, here and going forward, the year 2011 to be post-treatment. Because we can observe TIC to be significantly higher for TIF bonds than special tax bonds in 2011, while TIC is lower for TIF bonds in years 2012 through 2018, our decision to include 2011 in the post-period is conservative, resulting in a smaller treatment effect estimate than if we consider the policy to be in effect beginning in 2012.

Figure 3 shows the parameter estimates and 95% confidence intervals for the indicator variables from our event study.[12] An event study in which the pre-treatment

Figure 3: Event Study for True Interest Cost, TIF vs. Special Tax Issues



[12] The event study regression includes the same set of standard control variables as our main specification, quarter of issue fixed effects, with standard errors clustered at the issuer level.

indicators are statistically insignificant and do not show a noticeable trend supports the parallel trends assumption of the DID research design. For the period 2005 to 2009, none of the indicator variables are statistically significant at the 95% level, and the parameter estimates remain largely constant, leading us to be confident in the validity of our main specification.

Having established the validity of the key assumption of our identification strategy, we estimate the following equation, in which the parameter estimate on $TIF * Post2010_{it}$ is the primary variable of interest:

$$TIC_{it} = \alpha_0 + \alpha X_{it} + \beta_1 TIF * Post2010_{it} + \gamma_t + \delta_i + \varepsilon_{it},$$

where TIC = true interest cost, basis points; i = index of security type; t = index of quarter of sale; X = a vector of controls; γ = quarter of sale fixed effects; δ = security type fixed effects; and standard errors are clustered at the issuer level.

Control Variables

In addition to fixed effects, our control variables are standard variables used by researchers when analyzing borrowing costs on municipal securities in the primary market. We include as controls the size of the bond issue, as measured by the natural log of principal amount, which has been found to have an inverse association with borrowing costs in empirical work. We include the years to call or maturity, whether the debt issue was sold through negotiation and whether sold by private placement, whether federally taxable, whether subject to the alternative minimum tax, whether the issue is credit-enhanced, and whether the issuer used a financial advisor. Credit ratings are controlled for and operationalized as a set of dummy variables for the highest rating received from Standard and Poor's, Fitch, and Moody's, where the left-out category is prime grade and the included categories are for credit ratings of high grade, upper medium grade, and lower medium grade. We also include indicators for no rating, for two ratings, for three ratings, and for split ratings where an issue received more than one rating. Finally, we include Thomson Reuters' Bond Buyer 20 Index to control for market conditions.

Longer maturities, negotiated sales, and lower credit ratings have been found to be positively associated with issuer borrowing costs (Butler, Fauver, and Mortal, 2009; Guzman and Moldogaziev, 2012; Moldogaziev, Kioko, and Hildreth, 2017; Robbins and Simonsen, 2007). The literature on the effect of split ratings is mixed, and additional credit ratings have been found to lower costs only when a two AAA rating threshold is reached (Johnson and Kriz, 2002; Walker and Skip, 2009). Interest subject to federal income tax has been associated with higher interest costs (Cook, 1982; Moldogaziev, Kioko, and Hildreth, 2017; Yusuf and Liu, 2008). Market conditions, measured here by the Bond Buyer 20 Index, are considered important in municipal borrowing costs and the Index has been found to be positively associated with borrowing costs (Johnson and Kriz, 2002; Leonard, 1983; Moldogaziev, Kioko, and Hildreth, 2017; Peng and Brucato, 2004). The purchase of credit enhancements, issuance through private placement, and the use of an independent financial advisor have all been found to be associated with lower borrowing costs (Forbes, Leonard, and Johnson, 1992; Godfrey and York, 1994;

Johnson, 1994; Moldogaziev, Greer, and Lee, 2019; Moldogaziev and Luby, 2012; Moldogaziev, Kioko, and Hildreth, 2017; Vijayakumar and Daniels, 2006).

Results

Table 2 shows the results of our main specification. We find, as expected, that issues that are not rated ($p < 0.05$) and each indicator for a lower rating relative

Table 2: Main Regression on True Interest Cost

	(1)
	All Special Tax and Assessment Bonds
TIF*Post-2010	–49.83***
	(14.40)
Principal amount, ln	0.0654
	(3.559)
Highest rating is high grade	3.129
	(14.03)
Highest rating is upper medium grade	21.38
	(21.61)
Highest rating is lower medium grade	38.91
	(24.18)
Not rated	35.40**
	(15.88)
Split ratings	–2.721
	(30.48)
Has two ratings	9.957
	(11.32)
Has three ratings	–6.888
	(16.70)
Subject to AMT	–23.68
	(42.85)
Federally taxable	87.91***
	(13.29)
Private placement	29.75
	(19.62)
Negotiated	38.28***
	(12.35)
Guaranteed	–26.17***
	(9.167)
Has a financial advisor	–29.04**
	(14.41)
Years to call or maturity	1.092
	(1.300)
Weekly Bond Buyer 20 Index	100.8***
	(18.73)
Constant	–5.123
	(120.0)
Observations	2,444
Adjusted R^2	0.594

Notes: Clustered standard errors are in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

to prime grade are associated with an increase in TIC. Split ratings, three ratings, subject to AMT, credit enhanced ($p < 0.01$), and financial advisor ($p < 0.05$) have negative parameter estimates. Federally taxable ($p < 0.01$), private placements, negotiated ($p < 0.01$) underwritings, years to call or maturity, and the Bond Buyer Index ($p < 0.01$) are associated with higher TIC.

The primary variable of interest, TIF*Post-2010 is negative and statistically significant. We find that TIF debt after the policy announcement is, on average, 49.83 basis points lower ($p < 0.01$) than TIF issues prior to the policy announcement and special tax issues throughout the period. Among the regressors associated with lower TIC, the parameter estimate is by far the greatest in magnitude. In absolute value, market conditions, measured by Weekly Bond Buyer 20 Index, and whether the issue is federally taxable are the only regressors that affect average TIC more than the policy variable.

Robustness Checks

We repeat our main specification on subsets of the analysis sample: only TIF and special tax issues with refunding money, TIF versus only special assessment issues, and TIF versus only special tax issues. The regressions are otherwise identical to those found in Table 2. We find, as can be observed in Table 3, that our results are robust across subsets of the data, with all parameter estimates being negative and statistically significant. The refunding and special tax samples yield estimates similar to the main specification in Table 2, while the special assessment sample has a significantly larger parameter estimate. After the policy announcement, average TIC on TIF issues was 133.2 basis points lower than TIC on issues backed by special assessments ($p < 0.01$).

CONCLUSION

We use efficient markets theory and a DID research design to understand what happened when the state of California eliminated RDAs and TIF, and after when it made public policy and administrative changes to shore up the TIF market. As a result of the increased uncertainty, the immediate effect of the RDA policy

Table 3: Robustness Check Regressions on True Interest Cost

	(1)	(2)	(3)	(4)
	All Special Tax and Assessment Bonds	Refunding	Special Tax	Special Assessment
TIF*Post-2010	–49.83***	–48.70**	–37.38***	–133.2***
	(14.42)	(23.25)	(13.00)	(38.10)
Observations	2,439	1,406	2,141	1,220
Adjusted R^2	0.594	0.594	0.645	0.641

Notes: Clustered standard errors are in parentheses. Asterisks denote significance at the 1% (***), 5% (**), and 10% (*) levels.

change was a spike in TIF TICs in 2011. Eliminating the tax increment sent immediate shockwaves through the TIF market, hurting outstanding TIF bondholders and placing in limbo future redevelopment financing from the municipal securities market.

Despite the initial shock, the market calmed down by 2013 following several structural reforms. We provide evidence of a positive market reaction to the structural reforms implemented in California. From 2013 to 2018, average TIC for TIF debt is lower than on special tax and special assessment bonds. We believe this positive effect can be largely attributed to successful implementation of the structural changes found in the reform legislation.

The creation of SAs has proven to be an important restructuring mechanism. While dissolving RDAs, California created a new organizational structure of SAs with a governing oversight board of key stakeholders to wind down RDA affairs. SAs are required to continue making payments on the outstanding TIF debt of former RDAs, and are prohibited from taking on new obligations. In addition, unlike RDAs, SAs are not allowed to build up substantial non-debt service reserves. All in all, our results support the hypothesis that policy reforms resulted in a stronger TIF security.

The TIF reforms also improved the finances of the state and local governments. In terms of overlapping taxing districts, eliminating the tax increment effectively gave property tax revenues back to overlapping taxing districts, increasing the amount of property tax revenues flowing to California's local taxing districts going forward. From the state government perspective, they no longer have to spend money backfilling foregone school district property tax revenues, and in subsequent legislation, school districts have been prohibited from participating in TIF. This is a lesson for all states that use TIF and have to allocate property tax revenues across overlapping taxing districts to meet constituent spending demands.

After a period of uncertainty, reforms strengthening TIF debt security led to a lowering of the price of TIF debt, thus lowering redevelopment financing costs. As a testament to the state of California's ability to effectively design and implement restructuring legislation, Moody's Investors Service (2014) reported that no bonds reportedly incurred a monetary default directly from the dissolution of RDAs.

Given the fallout from the 2020 COVID-19 pandemic, and subsequent run-up in residential real estate values, TIFs in many states may find themselves in a difficult intergovernmental situation. Although TIF districts may be flush with cash from the run-up in real estate assessed values, other local government finances may be under pressure from reductions in non-property sources of revenues and greater expenditure demands, especially once federal funds dry up. In several states, TIF districts may be viewed as crowding out funding for overlapping taxing districts. Such states can look to TIF reforms in California for lessons on how to restructure their own-source local government financing systems, while simultaneously lowering borrowing and redevelopment costs.

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