



Higher Taxes for Fiscal Consolidation? Expected and Unexpected Effects of Municipal Tax Policy

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Abstract During episodes of fiscal consolidation in public budgets, there are different instruments to choose from. The literature shows broad consensus that expenditure cuts are preferred, whereas tax increases tend not to support the fiscal aim. The paper examines instruments for fiscal consolidation at the municipal level in Germany presenting theoretical and empirical findings in favor of revenue-based instruments, focusing on the case of municipalities in the Free State of Saxony. German municipalities can autonomously control several positions on both the expenditure side and the revenue side. Options for expenditure cuts are given both for voluntary and compulsory tasks. On the revenue side, municipalities have the opportunity to set assessment rates on both local trade taxes and property taxes. For this part of the consolidation process, the prevailing opinion is that higher taxes are offset by lower grants, which is not the case in reality. Nevertheless, there are cannibalization effects to consider that may induce primary effects in the short and medium term. Hence, the paper shows an updated view of the drawbacks and opportunities of revenue-based fiscal consolidation. The paper provides evidence for an economic and political discussion that predominantly focuses strongly on the harmful effects of tax increases on the economy.

Keywords Fiscal consolidation · Municipal budgets · Municipal taxes · Trade tax · Panel regression · Cox regression

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Introduction

Consolidation of public budgets is an ongoing issue of fiscal policy. At the same time, many municipalities are confronted with structural problems that do not allow them to balance their budgets despite good framework conditions.

Overall, the literature gives a diffuse picture of public budget consolidation. In addition, there is little scientific literature dealing explicitly with the municipal (local authority) level. Therefore, this paper integrates international literature, focusing on the case of German municipalities and adds empirical findings. As little research has been devoted to this topic thus far, the paper provides valuable insights.

The paper provides a first overview of the literature on consolidation instruments related to public budgets and applies the findings to the municipal level in Germany. However, many approaches on the national and international level are not transferable to municipalities directly. Local authorities only have limited influence on their expenditure and revenues. Thus, the study refers to instruments and strategies that enable municipalities to balance their budgets on a permanent basis.¹ The empirical examination reveals the effects of different fiscal instruments on the success of budget consolidation, especially for tax increases.

Policy Options for Fiscal Consolidation

As Stiglitz (2010, p. 1) pointed out, “*analytically, the task of deficit reduction is simple: cutting expenditures and raising taxes.*” The practical implementation of fiscal consolidation in local municipalities is especially complicated against the background of their federal and political-economic integration. Important secondary objectives of deficit reduction are the preservation of local self-government and the need to maintain services of general interest and technical infrastructure even in difficult budgetary situations. A government shutdown is not allowed to happen in a German municipality.

Against the backdrop of intense debates on instrumental design, there is agreement both in theory and in practice that there is no panacea for municipal budget consolidation. Although a mix of different consolidation instruments is suggested in the literature, debate about the individual instruments within this mix is not equally weighted. Even though empirical results frequently depend on the municipalities’ structural and legal specifics,² the literature suggests that higher revenue will stimulate higher expenditures. Thus, tax increases seem to be a rather unsuitable instrument for fiscal consolidation, as they will not fully contribute to budget improvement. However, particularly in the case of deficit-induced tax increases, empirical results tend to contradict an automatic reaction (Chapman & Gorina, 2012).

Alesina and Perotti (1995) empirically identified the composition of fiscal impulses for successful budget consolidation early on, which strongly influenced the subsequent economic debate on the topic. According to their study, successful consolidation packages were 80% expenditure-side instruments, mainly cuts in social transfers and staff

¹ Municipal insolvency or other types of solutions beyond budgetary policy (inflation, growth) are not considered.

² In particular, involvement of municipalities in the federal systems of the U.S. and Germany varies considerably.

expenditure. The results were later replicated and confirmed (Von Hagen & Strauch, 2001). Since the 2008/2009 crisis, there has been an increase in empirical studies on fiscal multipliers in practice and growth impacts of the corresponding fiscal stimuli (Alesina & Ardagna, 2009).³ Considering already high tax ratios in many countries, the Organisation for Economic Co-operation and Development (OECD, 2012) regarded a reduction in expenditure as the most promising option. Expenditure cuts have been considered to be more effective and long-lasting (Sutherland et al., 2012; Molnar, 2012; Wagschal & Wenzelburger, 2008). Cuts in the social sector, staff expenditure and subsidies appeared particularly promising (Sutherland et al., 2012; Molnar, 2012). The literature shows that instruments on the expenditure side dominate practical consolidation policy, both at the general government and municipal level (Blöchliger et al., 2012; Büttner & Wildasin, 2002).

In contrast, it is suspected that revenue instruments contribute to consolidation, but they are regularly discussed only as a last resort (Molnar, 2012). Instead, the deterrent effect of higher taxes and levies are given priority, assuming negative growth effects (Romer & Romer, 2007). In this context, a tax increase can cannibalise the revenue it generated and thus neutralise or even reverse the intended primary effect (Mountford & Uhlig, 2008). Spatial tax evasion appears to be particularly relevant for the municipal level as companies may manage their settlement and/or expansion decisions on a fairly small scale. Thus, tax increases have historically been a rarely used consolidation instrument, particularly for companies (Alesina & Perotti, 1995). Since this observation in the mid-1990s, the trend towards a reduction in corporate taxes has continued to the present.

However, a more in-depth examination of the literature reveals a differentiated picture. Large consolidation packages turned out to be more successful if they included instruments on both the revenue and the expenditure sides (Molnar, 2012). There is growing evidence, that spending cuts induce greater (negative) macroeconomic effects than revenue increases (Barrell et al., 2012; Hagemann, 2012; Alesina & Ardagna, 2009).⁴ Recent literature shows that even tax reforms including higher tax rates may have positive impacts on the economy (Bhattarai & Benjasak, 2021). Fiscal consolidation packages in the OECD consisted both of revenue increases and expenditure cuts in a country-specific mix (Kastrop et al., 2017). Regarding macroeconomic and distributive effects, Paulus et al. (2017) also revealed mixed results for European countries, supporting tax increases as consolidation instruments. Consequently, empirical studies do not show an overall preference for expenditure-side over revenue-side instruments.

Possibilities and Limits of Self-Controlled Consolidation

Municipalities within the Framework of Fiscal Federalism in Germany

Within Germany's federal structure, the municipal level (including the counties) has a special position. From a constitutional perspective, municipalities are not classified as

³ In the years following the financial crisis and the subsequent impact on public budgets, economic science increasingly focused on this topic. Since the economic revival in Europe, the topic receded into the background again.

⁴ Alesina and Ardagna (2009) presented different results. Mountford and Uhlig (2008) found mixed results.

an independent state level, but as part of the federal states (*Länder*). Nevertheless, German Basic Law (*Grundgesetz*) guarantees local self-government and thus secures the municipalities' existence.⁵ This subsequently leads to a two-tier state structure of the Federal Republic of Germany with a three-tier administrative structure consisting of the federal, state, and municipal levels. Thus, sub-national local authorities are not simply administrative units, but self-governing actors. This results in individual task portfolios, revenue competences and borrowing rights. These competences also include their own sources of tax revenue, participation in shared taxes and other sources of income.

In addition, fiscal significance within the federal state is relevant for characterizing the municipalities. At first glance, representing around one quarter of total expenditure, the municipal level appears to be less important than the federal or state level (Fig. 1). Its importance especially stands out in public investment where it accounts for around 55% of the total volume. However, only about 13% of total national tax revenue goes to the municipalities, which shows that financial allocations and reimbursements from the federal and state governments are indispensable for the fulfilment of municipal tasks. Connectivity within the federal system makes consolidation a particularly difficult task. Several instruments on the expenditure side and the revenue side are discussed herein focusing the ability of municipalities to control these instruments on their own.

Fiscal Consolidation via the Expenditure Side

Municipal task fulfilment is influenced to varying degrees by the federal states' legislation. Thus, municipal tasks can be differentiated according to their obligations. Only a small proportion (5–15%) is spent on voluntary tasks, while the predominant share of municipal budgets is devoted to compulsory tasks with limited decision-making powers in operational fulfilment. Thus, the simple demand for expenditure cuts overlooks the complex reality. Therefore, intelligent cutbacks are required.

Staff expenditure accounts for a significant share of total municipal expenditure (around 25%) and is, therefore, important in the context of budgetary cuts. It is not easy to reduce the number of public employees or working hours. Lower staffing levels may have negative consequences for the provision of core services and infrastructure. As an alternative, standardized administrative processes can be re-designed more efficiently within the framework of shared services, in municipal cooperation or by utilizing external service providers with lower personnel deployment.

Reductions in social expenditure is a common approach to consolidation due to the sheer volume (around 40%–45% of municipal budgets). However, social expenditure is not a monolithic block of activities, but must be viewed in a differentiated way. From a municipal perspective, the central obstacle to a reduction in social spending is its predominantly exogenous determination by both federal and state law. Municipalities are able to control social spending only to a very limited extent. In addition, there is the problem of further hierarchical division within the municipal level. Only the county level pays its own social expenditure (counties and independent cities) while the single

⁵ Article 28 (2) sentence 1 of the Basic Law (2020). Self-administration is the opposite of state administration (top-down hierarchy).

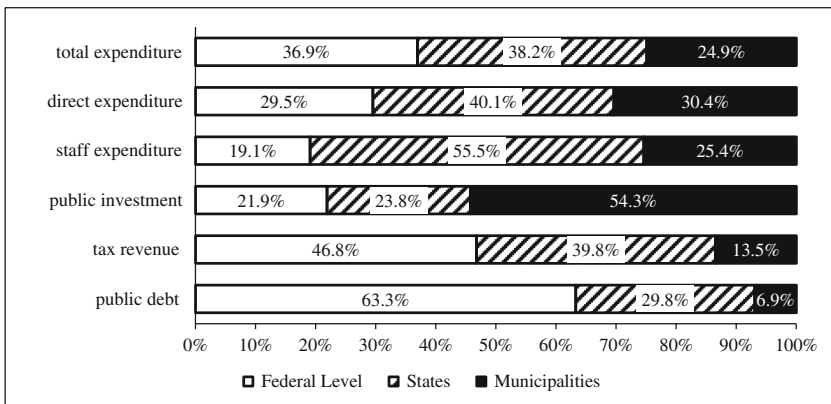


Fig. 1 Share of German government groups in selected budget items 2018. Source: Own calculations using data from the Federal Statistical Office (2019)

municipality indirectly finances this by the county levy and has no means of control itself.

Cuts in infrastructure spending⁶ are widespread during fiscal consolidation. The discretionary nature of investments and maintenance measures is an advantage over expenditure with a legal and contractual claim to uniform performance over time. By suspending these expenditures, deficits can be reduced. Although consolidation via infrastructure spending cuts is widely perceived as positive, related to the avoidance of subsequent costs, there are reasons to be critical. In the short term, budgets can be balanced by omitting infrastructure spending. In the longer term, even deficient municipalities have infrastructure needs that cannot remain unmet. Omission leads to wear and tear on the infrastructure with shorter lifetimes and restricted use. Accordingly, the consumption of funds is not reduced, but merely postponed.

Fiscal Consolidation Via the Revenue Side

Overview

For fiscal consolidation, municipalities have opportunities to access the income and assets of residents and companies via taxes and fee-financed services. At the same time, the municipalities are integrated into German fiscal federalism. Although the proportion has been steadily rising since the 1990s, local authorities generate less than 40% of their total income through taxes.

German municipalities generate tax revenue both from shared taxes and municipal taxes. From shared taxes they receive 15% of the income tax revenue, 12% of the capital gains tax revenue and roughly 3.4% of the value-added tax revenue. These three taxes cannot be affected by local governments. Influenceable taxes include trade taxes (also known as business taxes) and property taxes (A and B) as well as other small local consumption and expense taxes. For trade and real estate taxes, municipalities have a right to set assessment rates, while the assessment basis (basic amounts) is calculated

⁶ Infrastructure spending includes traditional investments in tangible fixed assets, but also maintenance expenditures and expenditures on rents and leases, which can be regarded as substitutes.

uniformly at the federal level. This eventually results in locally differentiated tax rates. In addition, there is a statutory right to levy municipal fees as another relevant type of revenue (on average 8% of total revenue). Overall, there is a noticeable, albeit limited, revenue autonomy for municipalities in terms of tax and fee revenues that will be explained in more detail in the following sections.

A supplementary system of grants, allocations and reimbursements from the states and the federal government, which accounts for a considerable proportion of municipal revenues (40% on average), makes the revenue structure complex and limits the endogenous influence of each individual municipality. In some cases, the allocations act as a compensatory factor for missing tax revenues (key allocations), while in other cases, tax revenues are required for allocations to be claimed (co-financing). A third group (refunds, general purpose allocations) is independent from fiscal capacity.

Real Taxes

Potentially negative economic effects of higher taxes is particularly important for local authorities. They are concurrently subject to conflicting priorities of balancing the budget and local attractiveness for companies and private households. Technically, increases in local assessment rates are relatively easy to implement by means of ordinance law, but political implementation can be much more difficult. It is important to state that adjustments in the assessment rates of local authorities in Germany have no direct effect on other state payment flows (higher trade tax levy, lower grants), because the factual situation is sometimes misrepresented in both theoretical and applied research (Büttner, 2001; Büttner, 2006; Steinrücken, 2015). Even though equalization systems are designed very differently internationally and countervailing effects may actually be expected in other countries, this does not apply to German municipalities.⁷ In fact, standardised assessment rates lead to an equalisation of fiscal capacity regardless of the individual assessment rate. However, the positive revenue effects on municipal budgets may be offset by taxpayers' potential avoidance effects.

Trade Tax

Low assessment rates have a favourable effect on the attractiveness of a location, while higher rates can further weaken a location's lack of attractiveness. Due to the spatial flexibility of companies, increases in assessment rates do not necessarily lead to additional revenue. This can be particularly critical in locations that are already facing structural economic problems. According to the theory of optimal taxation, determination of the assessment rates should be inversely proportional to tax elasticities (Ramsey rule). Thus, increases are promising if spatially less flexible enterprises are established at the location (Büttner, 2006). The fact that trade tax assessment rates have changed only slightly over the past 20 years indicates that local authorities attach comparatively high importance to the tax burden for entrepreneurial decisions.

⁷ Studies underestimate the closed nature of municipal fiscal equalisation systems. For an individual municipality gain in tax revenue according to a higher assessment rate, there is no inflow to or outflow from the system. The only possible solution is a redistribution of the additional funds. This differs from open systems with a genuine transfer withdrawal.

Within the framework of dynamic economic cycle models, shifting processes are possible, which result in complex adjustment reactions. The prevailing opinion in economics refers to a growth-damaging effect of higher corporate taxation in general and higher trade tax in particular (Romer & Romer, 2007; Fuest et al., 2013). In theory, effects are particularly strong when there are regional differences in taxation. However, empirical examinations lead to mixed results. An empirical study of the *Rheinische Westfälisches Institute für Wirtschaftsforschung* and *Finanzwissenschaftliches Forschungsinstitute* (RWI & FiFo, 2009) could not prove a direct effect of the trade tax rates on investment behaviour, but they did show effects on the wage bill. Fuest et al. (2013) traced negative effects on the labour market under specific conditions. With a time lag, the effects on the labour market were even greater than via the primary path of investment itself. Using a more comprehensive data set, Siegloch (2013) empirically demonstrated a significantly negative elasticity of employment of 1.2% to a 1% increase in the tax rate of a profit tax due to interregional labour market mobility. Despite mixed results, negative valuations of trade tax increases have so far been maintained in the literature.

Due to the certain positive revenue effect and uncertain negative consequences of the outcome at the local level, municipalities have an incentive to increase their assessment rates as part of budget consolidation. Countervailing effects on investment, employment and income are likely to be less severe than generally assumed. Some studies show spatial interactions and orientation towards neighbours, but sufficient evidence of competition for mobile capital via assessment rates has not yet been found (Janeba & Osterloh, 2013).

Property Tax

Property tax is another tax with extensive possibilities for local authorities. For rented properties, it is possible to pass on the tax to the tenants. This provides visibility of the tax and the potential for adjusting the residential location decision. In the case of owner-occupied properties, the tax is charged directly without the possibility of passing it on. The elasticity of the housing market is decisive for longer-term incidence, so the tax burden is effectively shared between landlords and tenants.

Real estate tax is generally expected to have a very low elasticity of supply, making it attractive for fiscal consolidation (Eerola & Määttä, 2013). However, the mixture of income tax, value tax and quantity tax, which characterises property tax in practice, does in fact result in rollover processes. However, due to the lack of mobility, only minor welfare losses are expected, especially when compared to taxes on income or consumption (Sutherland et al., 2012).

Municipal Expense Taxes

Revenue from small local taxes has more than doubled since 2000. A decisive advantage is that such revenue is generally not offset by any apportionment obligations or lower allocations. Additional revenue generated from these taxes remains entirely in the municipal budget. This makes tax increases in local consumption and expenditure taxes attractive for budget consolidation.

Recent examples of the introduction of new municipal taxes include bed taxes, accommodation taxes, cultural or tourism promotion taxes, which are similar in

character. More recent creations include the wind turbine tax, horse tax or solarium tax. As an accompanying instrument of budget consolidation, local taxes on consumption and expenditure can therefore certainly make a contribution. However, as a sole instrument, their impact is very limited.

Empirical Examination

Dataset

Various instruments for budget consolidation have already been outlined herein. The empirical section will thus examine the effects that come from the self-controllable and externally influencing factors discussed earlier as well as surrounding socio-economic variables. The data analysis was conducted for the municipalities in the Free State of Saxony, one of the 16 federal states of Germany.⁸ The period 2000–2014 was examined, resulting in a complete panel of 420 municipalities over 15 years. The empirical investigation focuses on the local authorities' primary balance.⁹ In the period under review, two-thirds of the municipalities had a positive primary balance on average. It was negative in the remaining third (for 2014 see Online Supplemental Appendix Fig. 1).

Panel Regression

Based on the data, a panel regression with fixed effects was performed. This is a longitudinal cross-sectional analysis of the type:

$$y_{i,t} = \alpha_i + \beta X_{i,t} + \varepsilon_{i,t}.$$

A fixed effects model permits a longitudinal estimate over the specified period, while preserving the characteristics of each municipality.¹⁰ The vector $y_{i,t}$ describes the dependent variable (primary balance) in EUR per capita. The matrix $X_{i,t}$ contains the independent variables. The term α_i is a specific constant in a fixed-effects model and maps unobserved individual effects over the temporal and local dimension. Thus, the fixed-effects estimation can account for both the process character of fiscal consolidation and individual trajectories.

For the empirical examination, both budget variables and control variables were used: Assessment rates (*AR*) and basic amounts (*BA*) of property tax A (*pt A*), property tax B (*pt B*) and trade tax (*trade*). While the basic amounts represent the revenue potential (uniformly defined nationwide), assessment rates represent local exploitation

⁸ Since Germany is a federal state, the details of municipal budget law and budget management differ between the federal states. That makes it difficult to compare municipalities on an individual level. Therefore, Saxony was singled out as the focus of the study, presenting a constant legal and institutional framework.

⁹ Primary balances (budgetary balance less interest payments) provided by the Statistical Office have been modified to be broadly in line with the national accounts' classification (purely financial transactions were excluded).

¹⁰ Particular effects of the individual communities were included without having to describe them explicitly (they are not necessarily randomly distributed, but have a fixed character). Besides this content-related justification, a Hausman-Test confirmed that a fixed effects model is suitable.

of this potential. Municipal shares of income tax (*income*) and value-added tax (VAT) are interpreted as external factors from a municipal point of view. Other taxes (*other t*) and fees (*fees*) may be controlled locally. Key allocations (*key*) are based on the standardized tax capacity and compensate overall tax weakness. Other allocations and reimbursements (*other a + r*) can represent task-accompanying reimbursements, flat-rate subsidies (e.g. social benefits) or application-bound payments. Investment grants (*inv g*) form a third group. On the expenditure side, staff expenditure (*staff*), infrastructure-related expenditure (*infra*), the balance of outsourced activity (*outsourced*) and other current administrative expenditure (*current*) are assessed. For the majority of municipalities belonging to a county, the county levy (*county l*) can primarily be interpreted as a proxy for social expenditure, as the counties spend around 75% of their budgets on this segment. As control variables for the socio-economic framework conditions, age structure is included via the shares of under 18-year-olds (*under 18*) and over 65-year-olds (*over 65*) in the total population. Both the local rate of employees (*employ res*) and commuters (*commute in* and *commute out*) describe the economic structure and the income level. The municipal unemployment rate (*unemploy*) is a proxy variable for direct and indirect effects of unemployment. These data are only available from 2008 onwards (due to several past territorial reforms). Regional gross domestic product (GDP) per inhabitant (*gdp*) represents total economic power. It is the only variable not available at the municipal level. Instead, each municipality was assigned the value of the respective county. Finally, a dummy variable is introduced for the three independent cities not belonging to a county (*independ*).

The data are price-adjusted, using a price index reflecting the municipal expenditure structure (see Hesse, 2019 for an empirical examination of German municipalities including construction of a specific price index). Table 1 summarizes the results of the estimation models. The data set was examined for multicollinearity, robustness and verified by factor analysis. The following key results were obtained, especially with regard to the revenue-side instruments.

Higher assessment rates of property tax B (*AR pt B*) and trade tax show significant positive impacts on the budgetary outcome ($p < 0.05$ and $p < 0.01$, respectively). Nevertheless, the parameter's characteristics suggest that increases in the assessment rate for trade tax are not fully allocated to balance improvements. While one assessment rate point has a calculated average value of EUR 0.43 per capita (without tax avoidance effects), the improvement in the primary balance is only EUR 0.242 per capita (2000–2014).¹¹ Thus, roughly half of the additional tax income is offset by higher expenditure or by avoidance effects. An increase in the assessment rate for property tax B supports the primary balance by almost the same amount (EUR 0.226 per capita per assessment rate point (2000–2014)). No expenditure effects or avoidance effects may be detected as virtually all additional revenue goes towards improving the balance (0.20 EUR per capita in theory versus 0.226 EUR per capita empirically).

Other (small) taxes and fees also lead to significant balance improvements. In the case of fees, the estimator is well below 1 ($\beta = 0.628$; $p < 0.01$), which indicates the corresponding additional expenditure in the fee-financed budgets. Exogenous influences on the revenue side (municipal shares in shared taxes, allocations and refunds)

¹¹ On the basis of an average basic amount of trade tax of 43 EUR/inhabitant and 20 EUR/inhabitant for property tax B.

Table 1 Results of the Panel Regression, Fixed Effects

Dependent variable: primary balance [EUR/inhab.]	Variable units	(Time series 1) 2008–2014		(Time series 2) 2000–2014	
(Constant)	EUR/inhab.	-12.068	(56.199)	-101.273**	(42.218)
<i>AR pt. A</i>	points	-0.069	(0.094)	-0.043	(0.072)
<i>AR pt. B</i>	points	0.177**	(0.082)	0.226***	(0.062)
<i>AR trade</i>	points	0.366***	(0.130)	0.242***	(0.094)
<i>BA pt. A</i>	EUR/inhab.	2.939**	(1.423)	1.545	(1.047)
<i>BA pt. B</i>	EUR/inhab.	2.573***	(0.622)	1.234***	(0.361)
<i>BA trade</i>	EUR/inhab.	2.287***	(0.040)	2.464***	(0.030)
<i>income</i>	EUR/inhab.	0.623***	(0.090)	0.505***	(0.057)
<i>VAT</i>	EUR/inhab.	0.711***	(0.233)	0.72***	(0.185)
<i>other t</i>	EUR/inhab.	1.619***	(0.486)	1.239***	(0.357)
<i>key</i>	EUR/inhab.	1.016***	(0.027)	0.974***	(0.018)
<i>other a + r</i>	EUR/inhab.	0.499***	(0.038)	0.611***	(0.027)
<i>fees</i>	EUR/inhab.	0.715***	(0.055)	0.624***	(0.043)
<i>inv g</i>	EUR/inhab.	0.865***	(0.015)	0.857***	(0.009)
<i>staff</i>	EUR/inhab.	-0.540***	(0.031)	-0.399***	(0.020)
<i>county l</i>	EUR/inhab.	-0.614***	(0.044)	-0.693***	(0.033)
<i>current</i>	EUR/inhab.	-0.201***	(0.031)	-0.331***	(0.026)
<i>infra</i>	EUR/inhab.	-0.838***	(0.011)	-0.798***	(0.007)
<i>outsourced</i>	EUR/inhab.	0.456***	(0.031)	0.418***	(0.021)
<i>under 18</i>	quota	-709.416***	(185.040)	205.293***	(74.400)
<i>over 65</i>	quota	-310.415***	(110.398)	-77.554	(47.702)
<i>employ res</i>	quota	-21.268	(65.280)		
<i>commute in</i>	quota	-40.388**	(19.922)		
<i>commute out</i>	quota	15.845	(51.005)		
<i>unemploy</i>	quota	-84.821	(83.634)		
<i>gdp</i>	EUR/inhab.	-0.004***	(0.001)	-0.004***	(0.001)
<i>independ</i>	dummy	-404.735***	(40.115)	-473.672***	(34.696)

Standard error in brackets, significance levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. $N = 420$

Source: Own calculations using data from the State Statistical Office of the Free State of Saxony (2018)

also show effects on primary balances. Key allocations from the state's budget are particularly strong, as they compensate overall tax weakness. Other allocations and reimbursements result in an improved balance only to a limited extent. This is consistent with theoretical considerations as these revenues are regularly directly related to certain expenditures (earmarked allocations).

On the expenditure side, infrastructure spending proves to be significant with a high estimator ($\beta \approx 0.8$; $p < 0.01$). Cutbacks in this type of expenditure have a particularly strong impact on the balance. The county levy as a proxy variable for the burden of social expenditure determined exogenously by the municipalities is also significant and highly effective.

Staff expenses, current operating expenses and the balance of outsourced service provision are significant variables with moderate estimators below 1 ($p < 0.01$). The estimators indicate the substitutability of these types of expenditure as well as a limited controllability. If corresponding expenditures can be reduced, they are largely compensated for by additional expenditures elsewhere, and only a smaller portion can be used to improve the balance.

On the other hand, exogenous demographic and labour market variables have little explanatory value. Regional economic strength (GDP, unemployment) does not seem to have a direct positive impact on the quality of municipal budgets. This is remarkable, as tax capacity usually correlates very strongly with economic strength. The dummy variable for the independent cities, being a counterpart to the county levy payments of the non-independent municipalities, is significantly negative and shows about the same value in both periods examined. The dummy mainly works as a proxy for social expenditure.

In general, municipal budgets are strongly influenced by exogenous factors that cannot be controlled by the municipalities themselves. However, there is still room for manoeuvring. In particular, the available instruments on the revenue side (e.g., assessment rates, other taxes, and fees) are promising. This distinguishes the empirical results presented herein from the usual statements in the literature.

Particularly striking is the discontinuity effect for infrastructure spending (Fig. 2). The investment behaviour is evidently dependent on the budget status. The slopes of the two regression lines show that a reduction very clearly supports the balance improvement in deficient municipalities (primary balance < 0). Once the budget is balanced (primary balance > 0), the slope remains negative, but is less steep (-0.286 compared to -0.835). A Chow test confirms that the slopes of the regression lines differ significantly.¹² Municipalities with balanced budgets regularly show below average infrastructure expenses. These are even below the level that would be required to maintain the asset value of the existing municipal infrastructure. This aspect must be viewed critically, as it has negative effects on public infrastructure's efficiency.

Survival Analysis and Cox Regression

The specific contribution of assessment rate policy in the context of municipal budget consolidation is examined in more detail via an event analysis. The question to be examined is whether there are different dynamics in the consolidation process when increases in assessment rates are used as an instrument. A Cox regression was carried out for this purpose defining two states and analyzing the retention durations in these states over time.¹³ Hence variables can be investigated over time, whereby the length of the time period and the points in time of the transitions (censorships) need not be known in advance. Using Cox regression, it is possible to identify the variables that significantly influence the transition from one state to the other (hazard ratio). This can easily be transferred to budget consolidation.

¹² The null hypothesis (equal regression slopes) can be rejected for the 2014 data ($p < 0.01$). The same applies to the pooled data for 2000 to 2014.

¹³ These instruments are mainly used in the field of medical research (epidemiological and clinical studies), but are also increasingly applied in the social and economic sciences (Danacica & Babucea, 2010).

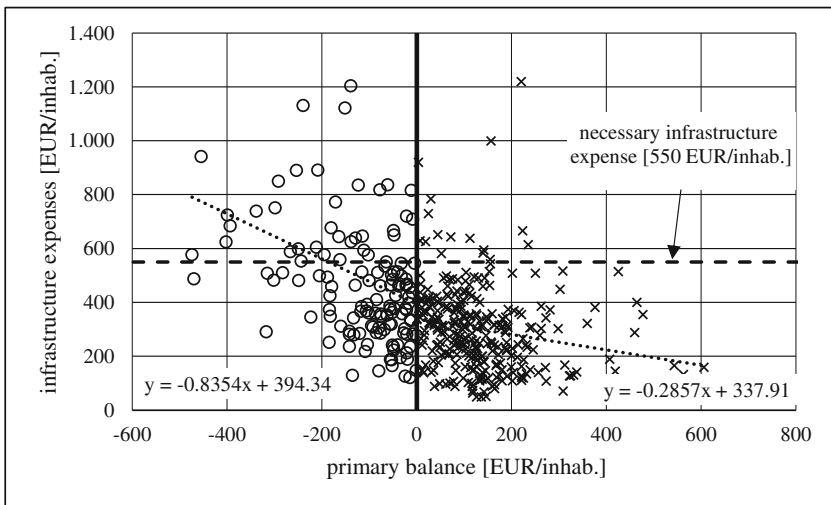


Fig. 2 Regression discontinuity effect for infrastructure spending 2014. The dotted line represents the level of infrastructure expenditure (550 EUR/inhabitant) that results in the preservation of municipal assets rather than asset erosion. $N = 420$. Source: Own calculations based on data from the Federal Statistical Office (2019) and the State Statistical Office of the Free State of Saxony (2018)

The year 2010 was chosen as the common starting point, when 145 municipalities showed a primary deficit. The status variable 1 was assigned to municipalities as long as their budgets remained deficitary and 0 as soon as they covered the deficit. The explanatory variable was also defined in binary form. It has the value 1 if an increase in the respective assessment rate took place in the period and 0 if the assessment rate remained constant or was reduced. The Cox regression results confirm that although the use of trade tax rates is basically a suitable instrument for budget consolidation, it does not significantly accelerate the consolidation path ($p > 0.1$). A similar result was observed for the increase in the assessment rates of the property tax B. Municipalities that increased their assessment rates have not been able to leave the deficit situation any faster than those municipalities with constant assessment rates. To this extent, no significant effect of the assessment rate policy as an accelerator (or retarder) of budget consolidation was identified in this case either ($p > 0.1$).

The conclusion is that assessment rate policy can be classified as a medium-term instrument. In order to keep the evasion effects of companies low, increases should be implemented gradually, since a fast and strong adjustment of the assessment rates does not lead to a faster budget balance.

Retroactive Effects / Cannibalization

When discussing the suitability of tax rate increases as an instrument for consolidation, the question of possible negative consequences (cannibalisation effects) arises, especially to what extent an increase in assessment rates will have negative feedback effects on the tax base. A panel regression model (fixed effects) was used to test whether the municipal assessment rate policy (*AR trade*) had a positive or negative impact on the development of the trade tax basic amounts in the same municipality. This is the immediate decision-

relevant effect for the policymakers in a municipality. In contrast, the macroeconomic effects of their assessment rate policy are unlikely to be of much relevance to individual municipalities. Additional control variables were used for this purpose, most of which were already used for the panel regression (Table 1). Moreover, the share of the manufacturing industry in the gross value added in the respective county (*industry*) represented a proxy for the regional industry structure. This was intended to explore whether industrially dominated regions have a higher tax revenue potential.

Table 2 summarises the results for the trade tax. If only a univariate test is carried out for the development of the assessment rates (*model 1*), there is no negative impact on the basic amounts ($p > 0.1$). The models including the control variables change the picture. In these models, regional GDP is a significantly positive influencing factor. If the period 2008–2014 is taken as the baseline (*model 2*), commuter flows are also significant. Labour market centres have significantly higher basic amounts. However, there is no evidence of an influence of the sector structure. In contrast, the assessment rates have a significantly negative influence. An increase in the assessment rate by one percentage point results in a reduction of the basic amount by 0.133 EUR per inhabitant ($p < 0.01$). This holds true when control variables for the labor market are removed (*model 3*). If, on the other hand, the longer

Table 2 Effect of the Assessment Rates on the Basic Amounts, Trade Tax, Fixed Effects

Dependent variable: trade tax basic amounts [EUR/inhab.]	Variable units	(Model 1) 2000–2014	(Model 2) 2008–2014	(Model 3) 2008–2014	(Model 4) 2000–2014
(Constant)	EUR/inhab.	-15.312 (9.482)	-133.098*** (50.942)	-21.676 (49.962)	-28.389 (23.759)
<i>AR trade</i>	points	0.081*** (0.025)	-0.133** (0.060)	-0.133** (0.066)	0.028 (0.025)
<i>18 to 64</i>	quota		210.336*** (52.236)	92.188* (55.103)	-24.564 (29.904)
<i>gdp</i>	EUR/inhab.		0.002*** (0.0006)	0.004*** (0.0006)	0.004*** (0.0002)
<i>industry</i>	quota		14.346 (37.159)	-31.413 (40.397)	-4.547 (13.354)
<i>independ</i>	dummy		-2.186 (24.323)	-2.193 (28.266)	-9.834 (10.740)
<i>employ res</i>	quota		82.157** (34.663)		
<i>commute in</i>	quota		140.001*** (9.381)		
<i>commute out</i>	quota		-71.254** (28.140)		
<i>unemploy</i>	quota		-19.997 (37.688)		

Standard error in brackets, significance levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. $N = 430$

Source: Own calculations using data for municipalities from the State Statistical Office of the Free State of Saxony, (2018)

period 2000–2014 is considered, the impact of the assessment rate on the basic amounts is no longer significantly negative (*model 4*). This leads to the conclusion that the effect of the trade tax assessment rate on its tax base is negative in the medium term, but disappears in the long term. This can be interpreted as an adjustment effect. In the short to medium term, companies try to circumvent an increase in the trade tax rate through entrepreneurial measures. In the long term, it turns out that within the overall package of all relevant location factors, the assessment rate policy is only one of many decisive elements.

The effect size is also remarkable. An increase in the assessment rate by one percentage point initially increases the respective tax revenue by 0.25% (primary effect, average assessment rate = 400%). Taking the model results into account, the increased assessment rate is then applied to the slightly lower basic amount. Consequently, approximately 73% of the primary effect is compensated for by the adjustment.

For local decisions, this means that, on the one hand, the desired additional revenue will only be generated after a certain time delay. On the other hand, local company structure is relevant. If companies are inflexible in shifting their wage bill and assets are tied to the location, a rather inelastic reaction may be expected, making tax increases more interesting. If, on the other hand, local firms are flexible in terms of staff and assets and thus not closely tied to the location, more elastic reactions are to be expected, leading to losses in tax revenue.

For property tax B, no comparable effect of the assessment rates could be identified. The tax base reacts almost completely inelastically to changes in the municipal assessment rate. This is in line with theory and shows that use of assessment rates for property tax B is advantageous in the context of budget consolidation for several reasons. The additional revenue from increases in the assessment rate does not reduce allocations elsewhere, the tax base is inelastic, and the burden is distributed between both groups of municipal residents and local businesses.

Conclusion

Fiscal consolidation at the municipal level is a challenging task for which complex mechanisms need to be considered. The discussion on suitable instruments for budget consolidation in the scientific literature demonstrates a strong preference for expenditure measures. Contrary to many statements in the literature, however, higher assessment rates on municipal trade taxes and property taxes do not result in an immediate reduction in transfers by other allocations or levy systems. The secondary effects are nevertheless worth discussing (withdrawal of liquidity and tax avoidance). However, the empirical results are less clear-cut than theory suggests. In addition to assessment rate policy, the selective use of local consumption and expenditure taxes as well as a fee policy based on the principle of cost recovery are effective consolidation instruments.

The empirical analysis for German municipalities in the Free State of Saxony generally confirms the aspects of assessment rate policy discussed in theory and adds some further aspects. The tax base for municipal trade tax reacts elastically to changes in assessment rates. As a result, increases in trade tax assessment rates can be compensated for to a considerable extent by a counter-reaction of the basic amounts. Nevertheless, a positive net effect remains, which can be advantageous especially in the

case of a locally bound company structure. In the long run, however, the retroactive effect fades away and the additional revenue remains fully in the community. For property tax B, the presumed inelastic reaction can also be confirmed empirically, therefore making it particularly attractive as a consolidation instrument.

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