Sustainability of municipal public debt:
An Austrian case study of
sub-national debt management

Johann Bröthaler, Michael Getzner, Gottfried Haber

Abstract

Austrian municipalities face manifold challenges regarding the sustainability of their budgetary policies, especially concerning public debt. On the one hand, municipalities are closely monitored and supervised by upper-level governments. Local borrowing is confined to pre-defined cases with respect to extra-ordinary expenditure. On the other hand, municipal discretion over expenditure and revenue is limited. In the current paper, we test whether municipalities' budgetary policies were sustainable in the sense of Bohn's (1998) sustainability test. We find that the debt limits were quite effective resulting in stationary debt levels, and in significant and sufficient reactions of the municipal primary surplus to increases in public debt. However, in order to achieve such sustainable policies, municipalities have widely cut investments in local infrastructure. From a long-term perspective, such development is problematic with respect to the quality of available vital infrastructure.

1. Introduction

Besides the current public debt crisis of central governments of countries within the Euro zone as well as outside Europe – e.g. the United States's government recently discussing the public debt limitations – many municipalities have experienced dramatic problems in financing their local and regional public tasks, such as providing local infrastructure, services (e.g. child care, schools), and communal public utilities (e.g. waste management). After the recent economic and financial crisis, the communal debt level and management has gained strong attention in the public debate. For instance, there are municipalities that are under provisional (acting) management by central government's commissioners in order to decide upon expenditures to lower public deficits and debt. Municipal councils and/or mayors are often no longer in charge regarding fiscal policies of the municipality for which they are elected since the commissioner has a veto on all municipal expenditure. Such drastic measures are undertaken to avoid insolvency of municipalities which are no longer capable of managing public debt. While the European Union's Stability and Growth Pact regulates fiscal policies in the Euro zone, and the recent developments regarding the European Financial Stability Facility (EFSF) provide support for countries with overwhelming fiscal problems, there have also been attempts on the national level to implement stability pacts as agreements between the different levels of government. Austria is no exception since the Austrian stability pact prescribes limits to national, regional (provincial) and local fiscal policies in terms of surpluses and deficits.

However, as it is often the case similar to national public debt, municipalities facing serious problems with public debt have for a longer period pursued unsustainable fiscal policies, or have failed to implement efficient fiscal and debt management, for instance, ignorance of risks regarding debt issuance in foreign currency. Both aspects – lack of sustainability of fiscal policies, and insufficient knowledge of financial mechanisms – point to institutional weaknesses in communal fiscal policy decision making.

Against this background, the current paper explores the sustainability of municipalities' fiscal policies based on Bohn's (1998) sustainability concept of public debt. Taking a unique data set on public debt of around 2,400 Austrian municipalities over a time span from 1992 to 2010, we test in several panel estimations whether municipal decision makers pursued fiscal policies. Sustainability of public debt is defined by this concept as sufficient reaction of the primary surplus of the current year to equalize debt increases in previous years. Our setting allows testing for differences between municipalities of different size (e.g. population, institutional capacities), location and geography, and of different politico-economic attributes (e.g. regional economy, ideology of the ruling majority) (cf. Neck and Getzner, 2001; Bröthaler und Getzner, 2011; Haber and Neck, 2006).

The paper is structured as follows: Section 2 provides a brief overview of different aspects important for discussing the sustainability of municipal debt. Section 3 includes the descriptive, and section 4 the econometric analysis with respect to testing the sustainability of budgetary policies of Austrian municipalities. Section 5 further discusses issues of privatization, outsourcing and off-budget debt that may contribute to a more thorough conclusion of the sustainability of municipal debt. Finally, section 6 discusses the results and concludes.

2. Sustainability of public (municipal) debt: a brief overview

As briefly discussed in the introduction, all levels of government are currently facing an enormous pressure on consolidating their budgets. However, the scientific debate on the sustainability of public debt has not emerged only recently but gained momentum especially since the 1970s when many European countries faced increasing public debt after the oil price shock. Scientific research was prominent particularly with respect to the introduction of the common Euro currency including the Maastricht criteria oriented towards sustainable fiscal policies.

There are many approaches towards empirically testing the sustainability of budgetary policies. For Austria, a number of approaches have been tested, e.g. stationarity tests regarding the time series of public debt, the Generalized Flood-Garber Test, and Bohn's test of sustainability (Getzner et al., 2001; Bohn, 1998; cf. Greiner and Semmler, 1999).[1] In the current paper, we employ an adapted version of Bohn's sustainability test complemented with tests on the (panel) stationarity. While Bohn (1998) estimated the reaction of the primary surplus-to-GDP ratio with respect to changes in the (lagged) debt-to-GDP ratio of the central government, our research question concerns municipal debt of Austrian communities. As described below, we have to adapt Bohn's test in light of available data. For instance, we do not have a ready-made reference similar to national (or regional) GDP at the municipal level. We therefore have to deal with per capita values of surplus and deficit, plus a number of additional explanatory variables accounting for the diversity in economic and political environments of municipalities (cf. Roubini and Sachs, 1989).

Regarding the ongoing scientific debate, there has not been much emphasis on municipal public debt. While the current discussion in Europe centers on debt and deficits of central governments, municipal debt policies have been neglected. In the US, the debate is more pronounced, for instance, regarding fiscal policy adjustments of municipalities, or the functioning of debt limits as currently discussed in the Euro zone. Buettner and Wildasin (2006) explored the fiscal adjustment policies of US municipalities in a panel setting and included variables such as different revenues categories, and grants. It turns out that sustainability of municipal debt is largely pursued by cutting expenditures in future periods. However, the authors also emphasize the importance of intergovernmental grants for easing fiscal stress of municipalities (cf. also Buettner, 2009).

Closely connected to sustainability and adjustment policies of municipalities is the ability of municipalities to issue bonds to financing investments (or their general deficit). For instance, Metcalf (1993) analyzes the determinants of issuing municipal bonds of which the author finds federal tax rates of special importance. Poterba and Rueben (2001) additionally stress the importance of fiscal institutions (such as balanced-budget rules) that are especially important for the municipal bond market, and therefore for the ability of municipalities to run deficits and build up public debt.

Restrictions on municipal debt (debt limits) have been discussed widely. Regarding the impact on the sustainability of regional and municipal debt, scholars have stressed the practical implications and limitations to such regulations. For instance, Granof (1984) analyzes the manifold problems in implementing and enforcing debt limits which are mainly due to the possibilities to circumvent the regulations. Regarding default by municipal governments, Epple and Spatt (1986) stress the need to account for externalities and to explore the potentially optimal limits to public debt.

With respect to municipal credit rating, Hájek (2011) recently developed a neural network methodology and tested its implications empirically by applying the model to US municipalities. His methodology leads to a high reliability in classifying municipalities correctly regarding their ranking and credit rating.

3. Data and descriptive analysis on municipal debt in Austria

3.1. Development of municipal debt and primary surplus from 1992 to 2010

Public debt of the general government and its subsectors is basically recorded according to the European System of Accounts 1995 (ESA 95). Sub-national governments in Austria include two levels, state and local governments (including municipalities, non-market off-budget companies, local authorities' associations, and locally based funds of public activities). Consistent and officially published time series data on public debt of all levels of government in Austria are only available for 1995 to 2010, but data on sub-national levels are not published in detail.

For the empirical and econometric analysis of municipal debt in Austria, we have built up a panel data set for the period of 1992 to 2010 for all 2,356 Austrian municipalities (excluding Vienna, which is municipality and federal province, and can thus not be compared to other municipalities). The data on revenue, expenditure and debt are based on administrative budgets (national public finance statistics of municipal closed accounts; see Statistics Austria, 2011). Consistent time series are available for revenue, expenditure and total financial debt. Breakdown of municipal debt (by financial instrument, debt holder, maturity or currency) has only been collected in recent years, but is not yet published. We therefore have to restrict our analysis to total debt without being able to differentiate according to these categories. All variables used in our analysis are described in detail in Table 1.

In order to embed our analysis into the current context of public debt of all levels of government in Austria, indicates that by far the largest share of public debt is concentrated with the central government. Latest figures suggest that a debt stock of around 63% (ratio to GDP; 2010) is issued by the central government (Republic of Austria), while state

---

1 The basic formulation of Bohn's sustainability test is based on the following empirical equation:

$s_t = \rho\, d_{t-1} + a_0 + A\, Z_t + e_t$, where s_t is the primary surplus, d_{t-1} denotes public debt, Z_t is a vector of other (economic or political) determinants, and e_t is the error term. All variables are calculated as ratio to GDP in Bohn's (1998) original test.

Tabele 1. Dependent and explanatory variables

Dependent variable	
S_{it}	Primary surplus of municipality i at time t; computed by adding up the current surplus and interest payments on municipal debt, at 2005 prices (EUR/capita)
Explanatory variables	
D_{it-1}	Debt of municipality i at time t; 2005 prices (EUR/capita)
Pop_{it}	Number of residents of municipality i at time t
UR_{it}	Unemployment rate of municipality i at time t taken from the Austrian Labor Market Service for the labor market district in which municipality i is located (%)
GDP_{it}	Regional GDP (gross domestic product) of municipality i at time t at 2005 prices for the sub-national (NUTS3) region in which the municipality is located (EUR/capita)
IR_{it}	Real interest rate level on federal public debt (%)
APP_{it}	Share of votes for the Austrian People's Party in the municipal elections of municipality i at time t (%).

Source: authors' own compilation, 2011 (data: Statistics Austria, 2011).

Tabele 2. Public debt[1] in Austria by subsector as a percentage of GDP, 1995–2010

Austria, % of GDP	1995	2000	2005	2010
Central government	58,2	60,8	58,5	62,6
State government	3,1	2,3	3,0	5,7
Local government	6,6	2,7	2,0	2,8
Social security funds	0,3	0,4	0,7	0,7
General government	68,2	66,2	64,2	71,8
Mio. Euro (curr. prices)	119.208	137.995	157.429	205.576

[1] General government consolidated gross debt at nominal values acc. to ESA 95 (Council Regulation (EC) N° 479/2009)

Source: Statistics Austria (2011), Eurostat (2011); authors' own calculations, 2011.

governments account for about 6% (ratio to GDP). Local governments (municipalities) account for a stock of public debt of around 3%. Including social security funds, the Austrian public debt-to-GDP ratio amounts to 71.8% in 2010 (about EUR 206bn at current prices); the increase from recent years clearly mirrors the current economic and financial crisis. At constant 2005 prices, total public debt of Austrian municipalities amounted to about EUR 12bn in 1995 and was reduced until 2010 to roughly EUR 7.5bn. Significant shares of this reduction were due to outsourcing of debt, and increase of off-budget debt such as the establishment of local infrastructure companies financed mainly through user fees. However, Figure 1 also suggests that municipalities were hit by the recent financial crises as well. In addition, the graph also indicates that the definition and accounting approaches, and the importance of Vienna both as a municipality and a federal state, significantly influence the picture with respect to the development and level of debt. In the current paper, we focus on the total debt of municipalities according to the published administrative budgets.

Figure 2 presents the public debt for Austrian municipalities in different population classes. While the development of debt seems to broadly follow similar paths, it is nevertheless important to recognize the relative shift of the level of debt among population classes. For instance, small municipalities carried a debt of around EUR 900 per capita (2005 prices) in 1992 but faced the largest increase in debt (103%) up to around EUR 1,800 EUR per capita in 2010. The smallest increase in debt was encountered by municipalities with 5,000 to 10,000 residents.

The increase in public debt is also mirrored in the increasing expenditure for debt repayment. As Figure 3 shows, Austrian municipalities spent around EUR 400m for debt repayment
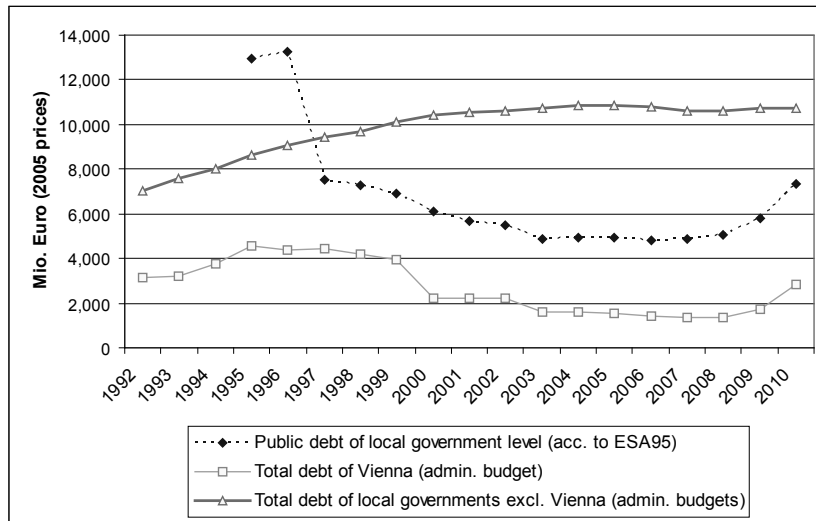
[1] Public debt of local government subsector according to ESA95 (municipalities including Vienna, local funds, selected (non-market) corporations (extrabudgetary units), and selected local authority associations; but excluding debt of local quasi-corporations)

[2] Total debt of local governments (2,356 municipalities, Vienna) according to administrative budgets.

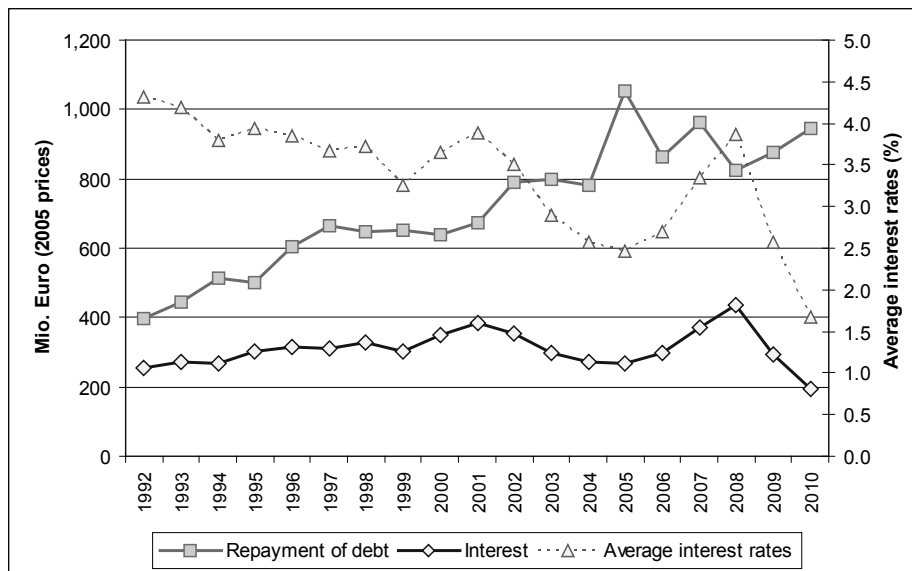*Source*: Statistics Austria, 2011; authors' own calculations, 2011.

Fig. 1. Public debt of local government level[1] and total debt of local governments[2] in Austria, 1992–2010, Mio. Euro (2005 prices)
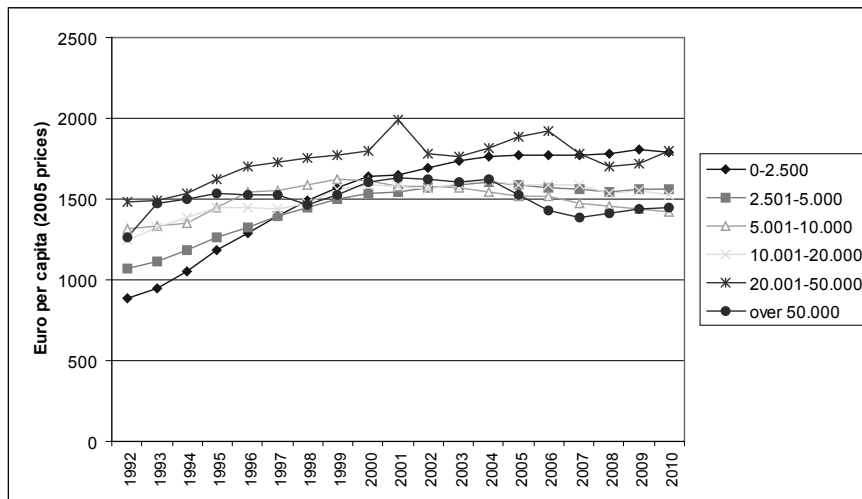
| Size of municipality	1992	2010	%-change
0-2,500	883	1,794	103.1
2,501-5,000	1,071	1,560	45.7
5,001-10,000	1,313	1,417	7.9
10,001-20,000	1,243	1,523	22.5
20,001-50,000	1,479	1,796	21.4
over 50,000	1,267	1,449	14.3
Total	1,118	1,609	43.9

Source: Statistics Austria, 2011; authors' own calculations, 2011.

Fig. 2. Total debt of local governments (excl. Vienna) in Austria by grouped by population size, 1992–2010, Euro per capita (2005 prices)

Source: Statistics Austria, 2011; authors' own calculations, 2011.

Fig. 3. Expenditure for debt repayment and interest (Mio. Euro, 2005 prices) and average interest rates (%) for debt of local governments (excl. Vienna) in Austria, 1992–2010
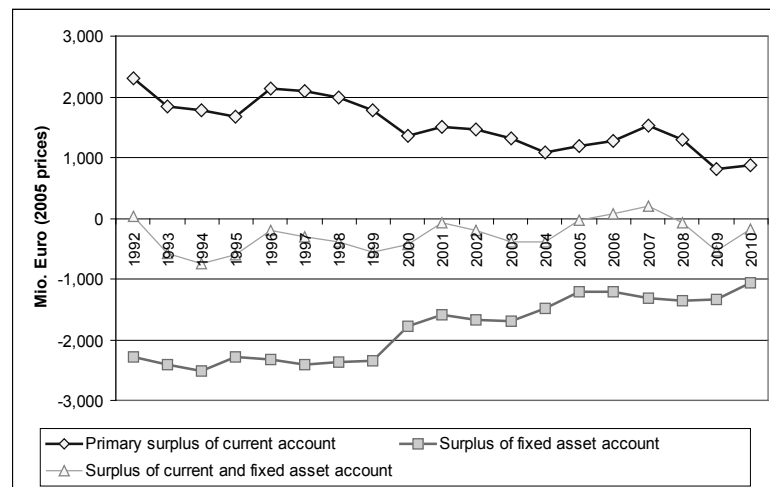
Source: Statistics Austria, 2011; authors' own calculations, 2011.

Fig. 4. Primary surplus of current account and surplus of fixed asset account of local governments (excl. Vienna) in Austria, 1992–2010, Mio. Euro (2005 prices)

in 1992 (constant 2005 prices), and close to EUR 1bn in 2010. However, Figure 3 also indicates that interest payments remained more stable suggesting that average interest rates for municipal debt decreased significantly. Nevertheless, the 2008 financial crisis with peaking interest rates can also be detected in the time series of interest payments.

Austrian municipalities faced a steadily decreasing primary surplus during the observation period, congruent with the increases in public debt. In the period between 1992 and 2010, the primary surplus (at constant 2005 prices) was divided roughly in half from around EUR 2bn to under EUR 1bn (Figure 4). At the same time, the surplus of the fixed asset accounts deteriorated equally.

Regarding the structure of municipal debt, Table 3 shows that debt service is predominantly financed by user charges, underlining the importance of revenues from municipal

Tabele 3. Structure of local debt[1] of local governments in Austria (excl. Vienna) as percentage of total municipal debt, 1992/2000/2010

Structure of local debt	1992	2000	2010
kind of coverage: debt service financed by	percentage of total local debt		
general budget funds (more than 50 %)	34	29	30
user charges (more than 50 %)	56	66	65
other entities	10	6	4
creditor: debt held by			
domestic banks or insurance companies	53	76	86
government authorities or funds	47	21	12
foreign banks and insurance companies	0	3	2
Rough estimations[1] on			
debt by currency			
national currency (EUR)			95
foreign currency (mainly CHF)			5
debt by rate conditions			
fixed interest rate			30
variable interest rate			70

[1] Rough estimations are based on an own evaluation of a small sample of municipalities

Source: Statistics Austria (2011), authors' own calculations, 2011.

goods and services. The holders of municipal debt are mainly domestic banks and insurances companies, while there is a decrease of local debt held by government units (esp. state governments reducing grants of loans, but also disposal of outstanding debt to private financial companies). No detailed data are published on further aspects of local debt structure. A rough estimation indicates that debt issued mainly medium or long-term (initial maturity more than 1 year), that municipal debt is mainly denoted in Euro, and that many municipalities calculate with fixed interest rates.

3.2. Fiscal policy and budgetary institutions and rules for Austrian municipalities

Before testing the sustainability of budgetary policies of Austrian municipalities in econometric terms, it is useful to describe briefly the discretion of municipalities regarding their expenditure and revenues, and the rules applied to municipal borrowing. An assessment of the discretionary power of municipalities and the possible impact on municipal debt is presented in Table 4 with reference to the economic structure of revenue and expenditure. In 2010, the major expenditure categories were personnel (staff) cost, expenses for goods and services purchased (public consumption), and (mandatory) intergovernmental grants paid to the state government. These categories account for roughly 73% of municipal expenditure. In addition, gross capital formation (investments)

as well form a major expenditure category with about 11%. However, it is interesting to see the significance of the different categories over time. In 1992, Austrian municipalities used to spend about 25% of their budget on investments; this figure decreased significantly while intergovernmental grants grew by roughly 10 percentage points. Especially in recent years (2009, 2010) municipalities cut investments substantially to balance their budgets; from an overall economic viewpoint, this significant reduction of communal investments is highly problematic since municipalities account for about 40% of total public investment in Austria (cf. ÖGemB/ÖSB, 2011).

The discretionary power (autonomy) on deciding upon expenses is different between categories. Regarding personnel and staff costs, the principal influence on expenditure is rather high but only in the medium term, while public consumption allows rather short-term reactions. In contrast, discretionary power in the case of grant payments to the state government representing an important expenditure category is low. Investments as well can be decided rather autonomously. Decisions on capital formation impact borrowing requirements in the short term and resulting debt services in the medium term. Thus, municipalities in general have discretionary decision-making power on major expenditure; however, the largest expenditure category cannot significantly be influenced.

Regarding revenues, Table 4 shows that municipal revenues mainly consist of shared taxes (about 30% of total revenues) while the second largest revenue category are current revenues for goods and services (mainly user fee for communal

Tabele 4. Economic structure of revenue and expenditure of local governments in Austria (excl. Vienna) 1992 / 2010 as well as assessment of local financial autonomy (low/medium/high influence and short-/medium-/long-term impact on expenditure and revenue)

Expenditure (% of total)	1992	2010	Principal influence	Impact in time
Personnel costs	21%	21%	high	medium
Current expenses for goods and services (public consumption)	22%	25%	high	short
Interest payments	3%	1%	medium	medium
Current grants paid [1]	17%	28%	low	long
Gross capital formation	25%	11%	high	short
Capital grants paid	3%	4%	high	short
Debt redemption	4%	6%	medium	medium
Other expenditure [5]	6%	4%	high	short
Sum	100%	100%		
Total (EUR m)	9,149	16,161		

Revenue (% of total)	1992	2010	influence	reaction time
Current revenues for goods and services [2]	22%	26%	high	short
Own taxes [3]	21%	17%	medium	medium
Shared taxes [4]	29%	30%	low	medium
Current grants [4]	8%	7%	low	medium
Disposal of non-financial assets	2%	2%	high	short
Capital grants	5%	7%	low	short
Borrowing (debt issuance)	9%	7%	medium	short
Other revenues [5]	4%	5%	high	short
Sum	100%	100%		
Total (EUR m)	9,154	16,229		

[1] Grants of current account mainly paid to state government level (and regulated by state law)

[2] Current revenues for goods and services (for market and non-market outputs) including property income (interest, rent)

[3] Revenues from own taxes (levied by municipalities but regulated by national legislation)

[4] Revenues from shared taxes and from grants based on the Austrian Tax Sharing System (negotiated between the public authorities but regulated by central government)

[5] Acquisition/disposal of financial assets (shares), granting (exp.) / repayment (rev.) of loans, formation/reduction of reserves

Source: data on closed accounts of local governments (Statistics Austria, 2011); authors' own calculations and assessment, 2011.

infrastructure). Revenues based on own taxes account for roughly 17% of total revenues (with a decreasing trend) but cannot be influenced in the short term. Discretionary power is highest with current revenues for municipal goods and services, and can also impact the municipalities' primary surplus in the short run.

As section 4 will show from an econometric viewpoint, the time series of municipal debt is rather stationary, and sustainability according to Bohn's (1998) concept is roughly fulfilled in Austrian municipalities. While the principal influence of municipalities on their expenditure and revenues is limited, the local borrowing rules for municipalities may be considered as a weak debt limitation. Federal (state) laws are in place that regulate the form and structure of state and local budgets and closed accounts (cf. VRV, 1997).

As Thöni et al. (2002) describe, municipal borrowing only takes place in strict regulatory frameworks implemented, supervised and monitored by regional (state) authorities. For instance, ordinary expenditure has to be financed by ordi-

nary revenues. Local borrowing can only be used for extraordinary and absolutely necessary spending that are unusual in nature and size (Thöni et al., 2002, 60ff.), and is only feasible if there is no other type of financing available. Special emphasis is laid on the fiscal sustainability of municipal budgets; this means that debt repayment and interest must not endanger the financial stability of the municipality. Interestingly, in assessing financial stability of governments the Austrian constitution refers to negative external effects on other governments by excessive debts.

All nine federal states (*Bundesländer*) in Austria have their own specific regulations and laws regarding municipal borrowing. In general, local borrowing requires approval by supervisory authority of the state government. Approval is also necessary for municipal guarantees as well as financial obligations similar to debt issuance (e.g. leasing). However, in some states the supervising authority's approval is only needed if municipal debt exceeds certain limits. The main weaknesses of these existing regulations certainly lie in the

missing explicit limitation of debt, in the lack of sanctions if targets are not achieved, and in the rather large room for interpretation of debt rules. In addition, there are many municipalities with their own regulations regarding balanced budgets, or the prohibition of deficit financing.

Limitations to excessive municipal debt were also implemented by the inner-Austrian Stability Pact that was developed and refined during recent years (1999/2005/2008/2011; cf. Austrian Stability Pact, 2011). These regulations bind all levels of government in Austria and quantify debt limits. Based on the European Growth and Stability Pact, the Austrian Stability Pact provides for the national budget coordination, for the medium-term orientation of the public budgets, and for the allocation of national convergence criteria (breakdown of the targeted public deficit-ratio-to-GDP into sub-sectors and levels of government); the pact also includes regulations on an information system for mutual reporting, and on sanction mechanisms.

Currently, upper limits for guarantees (for federal, state and local governments) are discussed (e.g. limits for guarantees as a percentage of tax revenue or total current revenue), and stricter rules for assessing risks of guarantees granted by governments may be drafted.

In the following, we will test whether the old but increasingly strict regulations on debt limitation had an impact on municipal fiscal sustainability.

4. Sustainability of Austrian municipalities' public debt: econometrics

Before modeling the interlinkages and a dose-response function for the municipalities' primary surplus reacting to increases in public debt along Bohn's sustainability test, we explored the time series characteristics of the central variables. As described in , the main variables include the primary surplus, the municipalities' debt, the unemployment rate, regional GDP, the real interest rate (level) of Austrian public debt, and the share of votes for the conservative Austrian People's Party.

In order to test for stationarity, we explored time series attributes for the variables primary surplus and public debt in more detail. As the results presented in Table 5 indicate, the two main variables are stationary time series variables. Table 5 summarizes the results of a range of panel stationarity tests with two basic specifications of the estimations, one with only an individual intercept, and one with intercept and trend. The hypothesis to be tested, H_0, is twofold. In the upper part of the table, H_0 assumes a common unit root process for each cross-section, while the lower part of the table presents testing results for H_0 denoting individual unit root processes. All tests indicate that the hypothesis of non-stationarity is rejected at significance levels of p<0.01. Thus, all variables considered here are I(0) variables.

This result is not only interesting regarding the econometric conclusions that can be drawn, but it is also an important indication for sustainability of municipalities' budgetary policies. Notwithstanding the rather limited period from 1992 to 2010,

stationarity of public debt indicates that – contrary to the central government's public debt – the Austrian municipalities' liabilities have not grown over the last years. Rather, public debt was stable at an average level of about EUR 1,500 to EUR 1,900 per capita for 2010 (current prices), depending on the population size of the municipality. In the discussion section below, we will argue that an implicit "debt limit" which is currently debated in Europe with respect to the financial and debt crisis and the stability of the Euro as a currency has restricted municipalities in their potential for borrowing. Besides the pressure on municipal budgets, municipalities are closely monitored regarding their financial policies.

We also tested the other potential explanatory variables such as GDP, the interest rate level, and the unemployment rate. Non-stationarity holds for the unemployment rate while GDP is stationary around a deterministic trend. The interest rate decreased steadily and significantly over the observation period, but is not stationary around a trend.

In order to develop our model estimation step-by-step, we start with a simple version of Bohn's sustainability test by including the lagged debt variable as the only explanatory variable to the estimation. Est. 1 in Table 6 shows a significantly negative coefficient for the variable D_{it-1} suggesting that an increase of real public debt by 100 EUR per capita caused policy makers to undertake measures to increase the municipality's primary surplus by about 2 EUR in the following year. However, in order to eliminate serial correlation, we included a significant AR(1) term in all estimations.

In order to test whether municipalities with a larger population have a fiscal policy advantage, e.g. by a comparatively better access to regional or central governments' funds, we included a quadratic population term into the estimation (cf. Est. 2 in Table 6). As may be expected, larger municipalities have an advantage with significantly higher primary surpluses. However, the effect of population size is clearly diminishing which is indicated by the significant quadratic term. The descriptive analysis above already discussed this effect by highlighting the relatively faster growth of debt in smaller municipalities.

Est. 3 presents the results when we account for potentially important fiscal policies to reduce the unemployment rate. As has been stressed in earlier papers on Austrian fiscal policies, public expenditure and public debt is largely driven in the short-term by reactions to the unemployment rate (discretionary fiscal policies). Higher unemployment rates in the labor market district where the municipality is situated also drives down the primary surplus. We thus find support of at least some form of active fiscal policies trying to reduce or mitigate unemployment.

In order to test for the dependence of the primary surplus on economic growth, we added a quadratic regional GDP term to the estimation. As Est. 4 shows, this term is significant indicating that the primary surplus of municipalities – *ceteris paribus* – increases with a higher regional GDP. However, the increase diminishes with higher GDP levels.

Est. 5 of Table 6 shows that decision-makers in municipalities also seem to react sensitively to the interest rate. As there is no consistent interest level of municipal bonds, we computed a time series of the interest level of central government's debt issuance taking into account the inflation rate measured by

Tabele 5. Time series characteristics of dependent and explanatory variables (panel stationarity)

	S_{it}		D_{it}	
	Statistic	Statistic	Statistic	Statistic
H_0: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-81.57***	-92.64***	-33.07***	-95.82***
Breitung t-stat		-44.72***		13.57***
H_0: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-70.06***	-76.12***	-8.69***	-15.45***
ADF - Fisher Chi-square	14119.4***	13885.4***	6736.76***	6280.50***
PP - Fisher Chi-square	15210.5***	15127.4***	5362.24***	4669.37***
Cross-sections included	2,356	2,356	2,354	2,354
n (min.)	41,686	38,806	38,489	35,849
Test for unit root in	Level	Level	Level	Level
Equation with	Individual intercept	individual intercept and trend	Individual intercept	individual intercept and trend
Conclusion	I(0)	I(0)	I(0)	I(0)

Source: authors' own calculations, 2011.

the GDP deflator. Thus, the real interest rate level mirrors a general level for Austrian public debt. As expected, higher interest rates go hand in hand with an increased primary surplus due to higher interest payments for flexible interest rate debt, as well as a precaution against excessive expenditure.

Finally, we tested for the importance of political economy theories by including a variable denoting the conservative Austrian People's Party's share of votes in municipal elections. It may be hypothesized that conservative governments may in general be more prone to lower public debt. Compared to the base line, the primary surplus seems to increase with the share of conservative votes. However, the share of votes for the conservative party is negatively correlated with the size of the municipality. With higher numbers of residents, the share of social democrats increases; however, larger municipalities also have higher primary surpluses. For instance, if we include the share of votes for the Austrian Social Democratic, the coefficient is 727.17 (level of significance p<0.01). This variable is highly correlated with the size of the municipality. Many larger municipalities, especially cities with resident numbers above 10,000, are ruled by a social democratic city government. These municipalities also have stronger economic potentials leading to a higher primary surplus. It is, however, noteworthy that the coefficient for the conservative party's share of votes is significantly smaller than for the social democrats. It thus seems that theories of political economy do not exhibit a major explanatory power in analyzing the Austrian municipalities' budgetary policies.

In order to test whether fiscal (budgetary) policies vary between the eight federal states of Austria[2] we split the sample

into sub-samples comprised of municipalities in the single states. Table 7 displays the results for the estimated equations based on the full model as described in Est. 6 (Table 6). The first major result of the different estimations (Est. 7 to 14 in Table 7) is that the coefficients for the lagged debt variable (D_{it-1}) broadly lie in the same order of magnitude between 0.02 and 0.05. However, closer inspection indicates some statistically different coefficient sizes for some of the federal states. By means of a Wald coefficient diagnosis test, we explored whether coefficients are statistically different from the (average) coefficient for the whole sample. For instance, municipalities in the federal state of Burgenland exhibit a coefficient of 0.0527 which is significantly different from the overall coefficient for all Austrian municipalities of 0.0363 (cf. Est. 6) at the p<0.01 level of significance (F-statistic 8.7998). The same holds true for municipalities in Lower Austria with an above-average coefficient for the lagged debt variable. In these two federal states, fiscal policies reacted (or needed to react) to increases in public debt in a more pronounced way.

Municipalities located in the federal states of Carinthia, Salzburg, Styria, and Tyrol did not react differently than the average while municipalities in Upper Austria and Vorarlberg indicated a below-average reaction of the primary surplus to public debt. Both federal states exhibit strong economic power with low unemployment and high economic growth rates.

Table 7 shows that the results for the explanatory variables are mixed with respect to the stability of the coefficients. In most federal states, higher unemployment rates lead to a reduction of the primary surplus, while higher interest rates were correlated to a higher primary surplus. On the one hand, it may be argued that municipalities may not be much different from each other since the federal states have rather

2   As discussed above, Austria has nine federal states. However, since the city of Vienna is both a municipality as well a federal state by its own, we have left out Vienna due to the large distor-

tion the inclusion of Vienna would result in.

Tabele 6. Determinants of the primary surplus of municipalities (sustainability of municipal budgetary policies)

	Est. 1 Coefficient (t-statistic)	Est. 2 Coefficient (t-statistic)	Est. 3 Coefficient (t-statistic)	Est. 4 Coefficient (t-statistic)	Est. 5 Coefficient (t-statistic)	Est. 6 Coefficient (t-statistic)
Constant	247.31 (102.42***)	-4964.45 (-6.24***)	-4867.82 (-6.10***)	-3234.03 (-1.85*)	-6167.34 (-3.62***)	-7776.87 (-4.57***)
D_{it-1}	0.02 (14.37***)	0.02 (14.22***)	0.02 (14.06***)	0.04 (24.90***)	0.04 (26.45***)	0.04 (26.60***)
Pop_{it}		1810.96 (8.75***)	1785.88 (8.60***)	494.70 (2.53**)	328.36 (1.72*)	313.52 (1.65*)
Pop_{it}^2		-147.49 (-11.01***)	-145.56 (-10.82***)	-38.28 (-2.98***)	-24.72 (-1.98**)	-23.22 (-1.87***)
UR_{it}			-292.06 (-3.31***)	-1035.26 (-11.66***)	-670.13 (-7.51***)	-516.89 (-5.72***)
GDP_{it}				763.47 (2.38**)	1310.81 (4.20***)	1613.91 (5.18***)
GDP_{it}^2				-56.35 (-3.51***)	-77.60 (-4.97***)	-92.04 (-5.91***)
IR_{it}					13.08 (17.60***)	15.58 (19.70***)
APP_{it}						83.52 (8.78***)
AR(1)	0.36 (75.42***)	0.34 (72.17***)	0.34 (72.64***)	0.30 (63.23***)	0.28 (58.51***)	0.28 (57.87***)
Adj. R^2	0.52	0.53	0.53	0.54	0.55	0.55
S.E. of regression	203.69	203.45	203.08	198.82	198.53	198.50
F-stat.	19.40***	20.02***	19.97***	21.23***	21.51***	21.56***
DW stat.	2.02	2.02	2.02	2.00	2.02	2.02
n	40,052	40,052	40,052	40,052	40,052	40,052
Period	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010
Cross-sections	2,356	2,356	2,356	2,356	2,356	2,356

Estimation: Panel EGLS (cross-section weights), including cross-section (fixed) effects (constants).
***$p<0.01$, **$p<0.05$, *$p<0.1$
Definition of variables: see Table 1.

Source: authors' own calculations, 2011.

similar budgetary frameworks for the budgetary processes. On the other hand, it is though interesting to consider the different size of the coefficients for the main variables pointing not only to a diverse economic picture but rather to differences in the stringency of rules and regulations.

Finally, we also tested for population classes. It has been put forward in the literature that there might economic rules for the "optimal size" of a community exist, for instance, in terms of costs of infrastructure provision. We therefore test

whether the estimated coefficients vary between groups of municipalities of different size (as we test for differences between population size groups, we leave out the quadratic population term included in the other estimations). The estimations in Table 8 (Est. 15 to 20) show that there are again quite substantial differences between the population classes. Larger cities above 10,000 inhabitants seem to have lower coefficients of the debt variable than smaller municipalities. This smaller reaction might be due to the larger possibility of cities to borrow (soft budget constraint) and a broader basis

Tabele 7. Sustainability of municipal budgetary policies: differences across Austrian federal states)

Federal state	Est. 7 Burgenland Coefficient (t-statistic)	Est. 8 Carinthia Coefficient (t-statistic)	Est. 9 Lower Austria Coefficient (t-statistic)	Est. 10 Upper Austria Coefficient (t-statistic)	Est. 11 Salzburg Coefficient (t-statistic)	Est. 12 Styria Coefficient (t-statistic)	Est. 13 Tyrol Coefficient (t-statistic)	Est. 14 Vorarlberg Coefficient (t-statistic)
Constant	-29253.05 (-2.98***)	-18509.72 (-1.57)	-3216.55 (-0.72)	662.82 -0.23	38864.00 (3.69***)	-7066.49 (-1.50)	68654.55 (6.71***)	35541.96 (0.81)
D_{it-1}	0.05 (9.49***)	0.03 (4.08***)	0.04 (17.3***)	0.03 (10.84***)	0.04 (8.55***)	0.04 (11.3***)	0.04 (8.71***)	0.02 (1.65*)
Pop_{it}	150.92 -0.22	5238.1 (3.38***)	670.72 (1.64*)	2699.05 (6.26***)	488.97 (0.70)	673.49 (1.65*)	-1120.03 (-2.62***)	-1557.5 (-1.5)
Pop_{it}^2	-11.73 (-0.25)	-330.22 (-3.33***)	-47.93 (-1.82**)	-184.3 (-6.58***)	-37.63 (-0.85)	-49.2 (-1.73**)	75.6 (2.66***)	131.23 (2.02**)
UR_{it}	-440.04 (-1.65*)	-3088.39 (-7.50***)	-877.44 (-3.92***)	-2193.76 (-12.78***)	-1599.16 (-3.88***)	461.93 (2.47***)	492.7 (1.29)	-917.86 (-1.63)
GDP_{it}	6024.81 (3.1***)	80.78 (0.04)	320.39 (0.4)	-1948.62 (-3.89***)	-7625.43 (-3.84***)	1291.00 (1.38)	-11982.12 (-6.04***)	-5249.14 (-0.62)
GDP_{it}^2	-313.18 (-3.14***)	-24.37 (-0.22)	-20.97 (-0.53)	92.45 (3.71***)	362.64 (3.77***)	-80.68 (-1.71*)	556.04 (5.75***)	216.34 (0.53)
IR_{it}	6.03 (2.41**)	-9.74 (-2.68***)	17.41 (9.87***)	14.3 (9.96***)	10.27 (3.39***)	24.89 (13.35***)	12.55 (4.51***)	29.42 (5.11***)
APP_{it}	244.59 (6.02***)	24.41 (-0.44)	104.44 (4.7***)	67.11 (3.64***)	70.27 (2.08**)	103.86 (5.45***)	34.82 (1.37)	119.96 (1.91*)
AR(1)	0.24 (13.21***)	0.28 (13.4***)	0.26 (26.32***)	0.28 (24.54***)	0.17 (8.56***)	0.23 (22.76***)	0.26 (18.24***)	0.24 (9.77***)
adj. R^2	0.45	0.54	0.46	0.48	0.60	0.51	0.57	0.50
S.E. regr.	146.65	187.01	189.61	120.88	154.60	233.87	226.99	284.68
F-stat.	14.1***	19.35***	15.50***	16.71***	25.22***	18.65***	22.61***	16.59***
DW stat.	2.05	2.04	2.02	2.00	1.92	1.99	1.99	2.02
n	2,907	2,244	9,741	7,548	2,023	9,214	4,743	1,632
Period	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010
Cross-sections	171	132	573	444	119	542	279	96

Estimation: Panel EGLS (cross-section weights), including cross-section (fixed) effects (constants).
***p<0.01, **p<0.05, *p<0.1

Definition of variables: see Table 1.

Source: authors' own calculations, 2011.

of revenues which might be used to fund public activities. It thus seems that smaller municipalities are more budget-constrained and limited in their borrowing capacities. Regarding cities over 50,000 inhabitants, the results generally have to be treated with caution since the sample is rather limited to only 8 Austrian cities above this population size while the vast majority of Austrian municipalities have resident numbers below 10,000.

5. Hidden public debt: privatization, outsourcing, off-budget and implicit debt

The analysis so far has exhibited two major results. First, Austrian municipalities' public debt is stationary, with significant and sufficient reaction of policy makers driving up the primary surplus if debt increases in order to pay back liabilities in the long run. Second, we also saw that there are many

Tabele 8. Sustainability of municipal budgetary policies: differences across population classes

	Est. 15	Est. 16	Est. 17	Est. 18	Est. 19	Est. 20
Population size	up to 2,500	2,501 to 5,000	5,001 to 10,000	10,001 to 20,000	20,001 to 50,000	over 50,000
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)	(t-statistic)
Constant	45.51	-15313.18	14441.72	17831.69	-11988.76	2647.44
	(0.02)	(-4.97***)	(2.29***)	(1.41)	(-0.57)	(0.05)
D_{it-1}	0.05	0.04	0.06	0.03	0.05	0.01
	(34.64***)	(15.91***)	(10.27***)	(2.49***)	(2.94***)	(0.58)
UR_{it}	482.6	-186.38	-354.21	-441.46	-2724.21	-2082.64
	(7.01***)	(-1.38)	(-1.43)	(-0.9)	(-3.29***)	(-2.42***)
GDP_{it}	0.53	3013.23	-2820.16	-3441.05	2581.34	357.44
	(0.01)	(4.95***)	(-2.28***)	(-1.39)	(0.62)	(0.03)
GDP_{it}^2	0.17	-147.17	139.09	167.79	-134.67	-55.61
	(0.01)	(-4.89***)	(2.28***)	(1.37)	(-0.66)	(-0.11)
IR_{it}	16.74	20.86	12.25	20.79	17.88	-1.56
	(20.37***)	(24.37***)	(5.07***)	(4.29***)	(2.28***)	(-0.15)
APP_{it}	96.95	163.5	101.59	35.95	12.61	-185.49
	(10.33***)	(10.79***)	(2.99***)	(0.52)	(0.11)	(-1.18)
AR(1)	0.55	0.56	0.59	0.61	0.57	0.3
	(123.58***)	(57.55***)	(37.36***)	(21.79***)	(11.32***)	(4.28***)
adj. R^2	0.48	0.69	0.48	0.48	0.54	0.62
S.E. of regr.	216.81	146.79	283.31	167.87	186.74	128.48
F-statistic	3868.41***	2236.69***	326.66***	108.47***	46.36***	30.37***
DW statistic	2.18	2.2	2.15	2.12	2.09	1.61
n	29,366	6,993	2,492	802	271	128
Period	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010	1992-2010
Cross-sections	1,774	474	164	51	17	8

Estimation: Panel EGLS (cross-section weights), including cross-section (fixed) effects (constants).
***p<0.01, **p<0.05, *p<0.1

Definition of variables: see Table 1.

Source: authors' own calculations, 2011.

more determinants of the municipalities' primary surplus such the unemployment rate, economic growth, population size, and the costs of debt in terms of the interest rate level.

However, as has been mentioned before in section 3, the reported municipal debt per capita only mirrors public debt present in the "official" budgets. There might be reasons to assume that "real" debt is much higher than the presentations. Two main sources of additional debt should be mentioned. First, municipalities have increasingly outsourced infrastructure companies, for instance, in the fields of waste water management, public transport, or waste treatment and disposal. Municipalities have established their own companies with legal frameworks of private companies, such as limited liability companies. These companies, owned by municipalities, have acquired substantial portfolios of infrastruc-

tures and, in addition, of formerly municipal debt. European Union rules of public debt explicitly state that such liabilities have to be reported as being "public debt" if municipal companies earn less than 50% of their total costs by their own revenues such as fees, charges, or other market revenues.

For Austria, it is estimated that off-budget public debt of municipalities may amount to about to 10% of reported municipal debt which would add about EUR 1.4bn to municipal debt levels; however, there is currently no statistic or official report available.[3] However, it is important to consider that debt for infrastructure investments which usually last for more than one generation make economic and distributional

3   Only recently, agreements on the European Union level have addressed this problem which may pose severe fiscal stress on municipalities.

sense as several generations utilize infrastructure and therefore also contribute to the financing of these basic endowments for consumption as well as production.

Second, municipalities above a certain population threshold, mainly statutory towns, have implicit (implied) liabilities in the form of future pension commitments for the city's civil servants and public officers. While this problem of implicit liabilities is prevalent in all public budgets, it is certainly of special interests to towns due to the potentially high relative burden of future pension payments.

6. Discussion, summary and conclusions for municipal debt management

Public debt of Austrian municipalities increased from about EUR 1,100 per capita to roughly EUR 1,600 per capita (constant 2005 prices). Notwithstanding short-term fluctuations, the main increases took place from 1992 until about 1995. In this year Austria joined the European Union and consequently had to reduce public deficits significantly. In fact, since the introduction of the common Euro currency, public debt level remained constant or even decreased slightly. Only recently, the financial crisis has lead to high fiscal stress on budgetary policies.

However, given the rather stable municipal debt levels in the period from the mid-1990s to 2008/2010, we find in our econometric panel analysis that stationarity tests indicate that debt level remained stable with a clear mean-reverting tendency. This result is interesting by itself since it underlines the often-heard claim that the current fiscal stress on Austrian public budgets is clearly a result of the international economic and financial crisis rather than a consequence of long-term unsustainable policies. However, this crisis has also exposed that debt levels have been too high (even if they were stationary), and that the discretionary room for stabilization policies (e.g. combating rising unemployment rates, fiscal stability packages for the financial sector) is diminishing fast.

Testing sustainability of municipal budgetary policies along Bohn's (1998) test corroborates the assessment of municipal debt policies as being sustainable, largely indicated by the significant and sufficient reaction of the primary surplus to debt increases in the previous year. This significant reaction shows that municipal policy makers have been aware of the municipal debt limitations which are in place in each federal state of Austria. As the descriptive analysis shows, however, their room for maneuver is limited since major expenditure and revenue categories cannot be influenced in the short term, and may also not have a short-term impact on the municipal primary surplus. Especially regarding intergovernmental grants to be paid to the state government constitute the largest expenditure category which cannot be influenced by municipal decision makers.

Municipal fiscal sustainability has thus been achieved primarily by reducing public investment in local infrastructure. The reduction of infrastructure investments is highly problematic since municipalities provide vital local infrastructure such as schools, child care facilities, but also water, sewage and waste management system. A reduction or lack of reliable infrastructure jeopardizes local and regional development especially in peripheral regions. Additional fiscal stress is posed on municipal budget by improved standards, e.g. for child care, fundamental schools, health facilities, or senior homes. While is certainly positive to raise standards, e.g. by reducing the number of students per class, costs for municipalities rise consequently without equally improving the municipal financial base.

The econometric estimations also indicate that the reaction function (i.e. the size of coefficients) varies between states, and between population classes. Some differences may be due to different regulatory frameworks. As section 3 has emphasized, regulatory frameworks for local borrowing and supervision of municipal budgetary policies are different between Austrian states.

Our analysis has also highlighted some aspects in municipal economic policies. As may be expected, municipal decision makers try to react to increasing unemployment, and to lower economic growth. Both factors influence the primary surplus of municipalities by smaller revenue, and by discretionary larger expenditure.

In addition to our econometric tests, we show that off-budget debt may aggravate the current debt crisis of municipalities, and assess the sustainability of public debt in light of sub-sovereign debt. However, there are currently no reliable statistic available that quantify off-budget debt, nor is data available on communal liabilities (guarantees), for instance, for communal infrastructure and enterprises.

All in all, our study shows that limits to debt and borrowing which are currently discussed on the European level with respect to central governments' debt, function under specific circumstances. With respect to municipalities, one major aspect is certainly that municipalities were always credit-constrained, and that they do not have much leeway for borrowing. Municipal fiscal policies are closely and strictly monitored by regional supervising authorities (mainly the state governments). State governments even may send government commissioners to municipalities if excessive debt levels occur. In such cases, all expenditures have to be reviewed and confirmed by the commissioner. Nevertheless, it is questionable which European or international institution may have the power to review and monitor budgetary policies of national governments in this strict sense. In addition, when compared to national governments, municipalities have only small autonomy in levying taxes (or designing new ones).

One major conclusion based on our empirical results lies in building and strengthening the institutional capacity of municipal decision makers to cope with the manifold and complicated tasks of sustainable fiscal policies. However, improvements of management skills, and fiscal policy knowledge of municipal decision makers, may not solve municipal fiscal problems regarding achieving sustainable policies. By now, municipalities had to react by reducing local investments in infrastructure. A possible solution may lie in the extension of autonomy of municipalities in levying their own taxes. However, the analysis of the concrete effects of increasing fiscal autonomy on the sustainability of municipal budgetary policies has to be left to future research.

References

Austrian Stability Pact (2011). Österreichischer Stabilitätspakt 2011, Vereinbarung zwischen dem Bund, den Ländern und den Gemeinden über eine Weiterführung der stabilitätsorientierten Budgetpolitik, BGBl. I Nr. 117/2011

Bohn, H. (1998). The Behavior of U.S. Public Debt and Deficits. Quarterly Journal of Economics 113, 949-963.

Bröthaler, J., Getzner, M. (2010). Fiscal decentralization and public sector growth: a case study for Austria. Public Finance and Management 10, 169-205.

Bröthaler, J., Getzner, M. (2011). Fiscal autonomy and total government expenditure: an Austrian case-study. International Advances of Economic Research 17, 134-156.

Buettner, T. (2009). The contribution of equalization transfers to fiscal adjustment: Empirical results for German municipalities and a US–German comparison. Journal of Comparative Economics 37, 417-431.

Buettner, T., Wildasin, D. E. (2006). The dynamics of municipal fiscal adjustment. Journal of Public Economics 90, 1115-1132.

Dafflon, Bernhard, Ed. (2002). Local public finance in Europe: Balancing the budget and controlling debt; in: Studies in fiscal federalism and state-local finance, Edward Elgar, Cheltenham.

Epple, D., Spatt, C. (1986). State restrictions on local debt. Journal of Public Economics 29, 199-221.

ESA 95, European System of Accounts 1995, Eurostat, Brussel, 1996.

Eurostat (2011). Database on Economy and Finance, Government Statistics, ec.europa.eu/eurostat (gov_dd_edpt1, gov_dd_sgd, Nov. 2011).

Ganof, M. H. (1984). A fundamental flaw of debt limitations for state and local governments. Journal of Accounting and Public Policy 3, 293-310.

Getzner, M., Glatzer, E., Neck, R. (2001). On the Sustainability of Austrian Budgetary Policy. Empirica 28, 21-40.

Greiner, A., Semmler, W. (1999). An Inquiry into the Sustainability of German Fiscal Policy: Some Time-Series Tests. Public Finance Review 27, 220-236.

Haber, G., Neck, R. (2006). Sustainability of Austrian Public Debt: A Political Economy Perspective. CESifo (Center for Economic Studies and Ifo Institute for Economic Research), CESifo Working Paper Series 1816.

Hájek, P. (2011). Municipal credit rating modelling by neural networks. Decision Support Systems 51, 108-118.

Metcalf, G. E. (1993). Federal taxation and the supply of state debt. Journal of Public Economics 51, 269-285.

Neck, R., Getzner, M. (2001). Politico-Economic Determinants of Public Debt Growth: A Case Study for Austria. Public Choice 109, 243-268.

Poterba, J. M., Rueben, K. S. (2001). Fiscal news, state budget rules, and tax-exempt bond yields. Journal of Urban Economics 50, 537-562.

ÖGemB/ÖSB (2011). Gemeindefinanzbericht 2011. Austrian Federation of Municipalities & Austrian Federation of Cities, Vienna.

Roubini, N., Sachs, J. D. (1989). Political and economic determinants of budget deficits in the industrial democracies. European Economic Review 33, 903-938.

Statistics Austria (2011). Public Finance Statistics for Austria, data on revenue, expenditure and debt of Austrian local governments 1992-2010, public debt and non-financial accounts of general government (by subsector) 1995-2010; gross regional product (by NUTS-3 regions) 1995–2008; population statistics (based on population census 1991/2001 and statistical population register 2002–2010), ISIS Database and www.statistik.at (Nov. 2011), Vienna.

Thöni, E., Garbislander, St., Haas, D.-J. (2002), Local budgeting and local borrowing in Austria, in: Dafflon (2002), 45-74.

VRV 1997, Voranschlags- und Rechnungsabschlussverordnung 1997 [Budget and Closed Accounts Regulation for state and local governments in Austria], BGBl. Nr. 787/1996 idF BGBl. II Nr. 118/2007.