

Sovereign Bond Market Reactions to Fiscal Rules and No-Bailout Clauses – The Swiss Experience

Lars P. Feld^a, Alexander Kalb^b, Marc-Daniel Moessinger^b,
Steffen Osterloh^{b,*}

^aWalter Eucken Institut and University of Freiburg

^bZEW Mannheim

September 2011

Abstract:

In this paper we investigate the political determinants of risk premiums which sub-national governments in Switzerland have to pay for their sovereign bond emissions. For this purpose we make use of financial market data from 308 tradable cantonal bonds in the period from 1981 to 2007. Our main focus is on two different political influences. First, many of the Swiss cantons have adopted very strong fiscal rules. We find evidence that both the presence and the strength of these fiscal rules contribute significantly to lower cantonal bond spreads. Second, we study the impact of a credible no-bailout regime on the risk premia of potential guarantors. We make use of the Leukerbad court decision in July 2003 which relieved the cantons from backing municipalities in financial distress, thus leading to a fully credible no-bail out regime. Our results show that this break lead to a reduction of cantonal risk premia by about 25 basis points. Moreover, it cut the link between cantonal risk premia and the financial situation of the municipalities in its canton which existed before. This demonstrates that a not fully credible no-bailout commitment can entail high costs for the potential guarantor.

Keywords: sub-national government bonds; numerical fiscal rules; no-bailout clause; sovereign risk premium; fiscal policy; Swiss cantons

JEL Classification: E62, G12, H63, H74

Acknowledgements: Valuable research assistance from Kira Köhler and Hanno Silberhorn is gratefully acknowledged.

* Corresponding author
Centre for European Economic Research (ZEW)
L7, 1, D-68161 Mannheim, Germany

Phone: +49 621 1235 165
Fax: +49 621 1235 223
E-mail: osterloh@zew.de

1. Introduction

The ongoing economic and financial crisis has put severe strain on the public finances on both sides of the Atlantic. Simultaneously to the increasing debt levels, investors demanded much higher compensations for the growing default risks of several Euro countries (esp. Greece, Ireland, Portugal) as well as of U.S. states (esp. California, Illinois), thus boosting their sovereign bond yields. The exploding refinancing costs put further pressure on the public budgets and call for measures which are capable of restoring the market confidence in the sustainability of public finances in the short run. Our work focuses on two different political measures which can be suspected to work in this direction: numerical fiscal rules and credible no-bailout policies. Their effects will be tested empirically for sovereign bond emissions at the sub-national level of Switzerland. The Swiss system serves as a perfect laboratory since it is characterised by an extensive fiscal federalism with high autonomy at the cantonal level – especially with regard to constitutional and/or statutory fiscal restraints. Since most Swiss cantons issue tradable bonds, we can make use of unique financial market data on 308 cantonal bonds in the period from 1981 to 2007 to measure the investors' confidence in the cantons' outstanding debt.

With regard to fiscal rules, the political as well as the academic sphere seem to be very optimistic that such voluntary restrictions of fiscal policy should have a positive impact on market participants' confidence.¹ It is already shown in the literature that fiscal rules, which are characterised as “permanent constraint(s) on fiscal policy, typically defined in terms of indicator(s) of overall fiscal performance” (Kopits and Symansky 1998, p. 2), limit debt, deficit, expenditure and revenue levels of governments, and therefore make public finances more sustainable. If the financial markets actually believe in such strong effects of fiscal rules, their adoption should immediately restore the market confidence in financial sanity and result in lower risk premia. However, as will be shown below, the empirical evidence for those fiscal rules already existing in U.S. states and European countries points to a quantitatively rather low or even non-existent link between fiscal rules and government bond yields.

One explanation for such small effects is straightforward: these existing rules are usually too weak and unreliable in order to have a strong effect on the investors' confidence. Here the Swiss cantons come into play. In the past decades, almost all of the 26 cantons of Switzerland have introduced different forms of fiscal rules that require them to balance their budget over

¹ See, e.g., the proposals in the report of the task force on the future of economic governance headed by the President of the European Council Herman van Rompuy (Task Force on Economic Governance 2010).

time and many of these rules are much more stringent than any form of restrictions existing in the U.S. or at the European level. Just to give an example, some cantons have constitutional requirements which oblige them to increase tax rates if budget deficits surpass a deficit threshold (see Stauffer 2001, p. 72). Such a mandatory enforcement mechanism is to our best knowledge unique and generates a much more credible restriction to public finances as compared to rules in other parts of the world.

In order to analyse the relationship between fiscal rules and yield spreads we employ the fiscal rule index proposed by Feld and Kirchgässner (2008). More specifically, we use two different kinds of indicators, one for the existence of fiscal constraints and one for the strength of numerical fiscal rules in the cantons. Based on the yield spreads to federal bonds we show that both the presence and the strength of fiscal rules significantly contribute to lower risk premia. Further results of the analysis show that an increase in the deficit of cantons with tighter fiscal rules induces bond spreads to increase less than in cantons with less strict rules. Moreover, this significant dampening effect on the bond spreads still holds when we control for the preferences of the voters in the cantons.

The second political influence concerns the benefits of having a credible no-bailout policy with respect to other (usually lower tier) governments – or put it another way, the costs of an implicit guarantee in a regime where market participants ascribe a positive possibility to a bailout. The latter gets high relevance at the European level since the no-bailout policy of one Euro country by the others (which was originally specified in the Maastricht Treaties) has come under increasing pressure. The literature has focused almost exclusively on the benefits of such an implicit guarantee for those issuers who *are* potentially *bailed out*, and ignored the costs for those who potentially *bail out*. Furthermore, if the markets assume that a central government would support a lower-level government in distress, spillover effects should prevail. Risk premia should then not only reflect the government's own budgetary position, but also those of the lower-tier governments which potentially will be bailed out.

Concerning the costs of such an implicit guarantee, we can exploit a natural experiment generated by a court decision in July 2003. In this decision the Supreme Court in Lausanne decided that there is no bailout of the canton Valais for the highly indebted municipality Leukerbad. This decision was a break since it relieved the cantons from backing municipalities in financial distress, thus leading to a fully credible no-bail out regime at the cantonal level. We identify two consequences of this break: firstly, the cantonal yield spreads decreased significantly, and secondly, it cut the link between cantonal risk premia and the budgetary position

of the canton's municipalities. These findings hint to significant costs that a non-credible no-bailout commitment can entail for the potential guarantor.

The remainder of this paper is structured as follows: Section 2 presents the theoretical background while in section 3 the institutional setting of the fiscal rules on the cantonal level in Switzerland is presented. The empirical analysis is provided in section 4, and finally, section 5 reiterates the main findings of our study and discusses some implications.

2. Literature Review and Hypotheses

2.1. General Determinants of (Sub-National) Bond Spreads

The methodological standards for the analysis of sovereign bond spreads are mainly set by several studies investigating the yield differentials of European bonds in the aftermath of the monetary union (see, e.g., Codogno, et al. 2003; Manganelli and Wolswijk 2009; von Hagen, et al. 2010). The following factors are identified as the main drivers of yield spreads by these authors:

1. Exchange rate risk
2. Default risk
3. International risk aversion
4. Liquidity risk

While most studies focus on the yield spreads of central governments, there are so far only few studies analysing the determinants of bond spreads for sub-national governments. Schuknecht et al. (2009), e.g., investigate the main drivers of sub-national bonds in Germany, Spain and Canada. Whereas exchange rate risk obviously plays no role for explaining yield differentials between bonds of different public issuers within the same country, their findings suggest the other determinants mentioned above can be identified to be relevant at the sub-national level. In particular, bond spreads are found to strongly depend on the fiscal performance of the sub-national governments (measured by the level of public debt and fiscal balance), thus reflecting the consideration of default risks.²

In the Swiss context, there is so far only one study which analyses the determinants of yield differentials between the cantonal bonds (Küttel and Kugler 2002). Using a relatively small sample covering 84 bonds from 15 out of the 26 Swiss cantons in the period from 1990 to

² Earlier evidence on sub-national bond-markets is provided by Bayoumi et al. (1995) for U.S. states, Booth et al. (2007) for Canadian provinces, and Schulz and Wolff (2009) for German states.

1998, the authors do not find significant effects of fiscal indicators such as debt, budget balance, or taxes on the yield spreads; on the other hand, institutional factors such as direct democratic elements as well as cultural differences seem to be important for explaining the yield differences. A variable which accounts for the existence or strength of numerical fiscal rules is, however, not incorporated to the estimation specification.

2.2. (Non-)credible No-Bailout clauses

A further aspect which might be relevant regarding the risk assessment of sovereign issuers in a federal setting is the risk taking for other, usually lower level, governments. This factor so far has not attracted attention in the literature. Although in many instances the liability for other federal levels is regularly disputed *ex-ante*, many of such no-bailout policies are regarded as not credible by investors. There often is the wide-spread expectation that the upper level government would – at least partially – bail out lower level governments which are in financial distress.³ Such implicit debt guarantees should have contrary effects on the risk premia for those issuers who *are* potentially *bailed out* as compared to those who potentially *bail out*. The former should have a favourable assessment at financial markets, since their liabilities are backed up by the guarantor, whereas the latter must be expected to pay an additional premium depending on the probability that other governments get into fiscal distress and are bailed out.

In addition to the level effect, a spillover effect can also be expected. For instance, if the markets expect that a certain government would bail out a lower level government which is in financial distress, the investor's risk assessment should not only provide an assessment about the higher level government's budgetary position, but also about the probability of additional costs through a potential bailout, which is then reflected by the financial situation of the backed governments.

So far, the existing literature mainly focuses on the positive effect of potential bailouts for the risk assessment of lower level governments and thereby mainly rests upon indirect evidence. Schuknecht et al. (2009) show that a non-credible no-bailout policy in the federal context of Germany prior to the European Monetary Union (EMU) – i.e., there was the widespread expectation that the federal government would help German states in financial trouble – led to favourable risk premia of the German states. This effect disappeared after the start of the EMU, which limited the possibility of the federal government to bail out the states. Heppke-

³ This commitment problem in federal systems has been studied extensively in the literature; see, e.g., the models by Wildasin (1997) and Goodspeed (2002) as well as the survey in Oates (2005).

Falk and Wolff (2008) provide further evidence that a higher probability of receiving a bailout by the federal government tended to reduce the German states' risk premia,⁴ whereas Schulz and Wolff (2009) do not find the expected increase of state risk premia after a court decision that averted the bailout of the state of Berlin. Evidence at the international level comes from Dell'Ariccia et al. (2006) for emerging markets. They show that reduced expectations for a bailout of highly indebted countries by the international community (after the decision not to bail out Russia in 1998) increased the cross-country dispersion of spreads, since investors paid more attention to country-specific risks. Finally, the relevance of spillovers in a federation, i.e. the responsiveness of creditworthiness to other governments' fiscal positions, has received almost no consideration in the literature. The notable exception is Landon and Smith (2000) who study Canadian provinces; they use credit ratings (due to missing financial market data) and find negative effects of the central government's and other provinces' indebtedness on the creditworthiness of provinces. It is striking that almost all of the studies mentioned above focus on the benefits for the governments which are protected by conceivable bailouts; they do not account for the costs of the liable governments in terms of higher risk premia which are associated with the threat of potential bailouts. The adverse effects of such "risk transfers" on risk premia has only recently found some consideration with respect to the interplay of the private financial to the public sector: Ejsing and Lemke (2001) as well as Attinasi et al. (2009) demonstrate that the announcements of bank rescue packages by European governments in 2008 led to a decline of risk premia for banks at the expense of an increase for country bonds.

With respect to a risk transfer between the different tiers of government in a federal system, the Swiss experience offers the chance to investigate the consequences for the liable government in greater detail. It is possible to estimate the costs of potential bailout guarantees by means of the Leukerbad court decision in 2003, where the Supreme Court in Lausanne decided – contrary to general expectations – that there is no-bailout of the canton Valais for the highly indebted municipality Leukerbad.⁵ The small community (2,000 inhabitants) had gone bankrupt after having piled up debt amounting to 346 million Swiss francs; since the cantonal government refused to bail out the municipality, a group of creditors issued lawsuits against the canton to pay for the obligations, so the case went to the Swiss Federal Court. Its decision was essential with respect to financial markets' perceptions about implicit cantonal bailout

⁴ The bailout probability is indicated by an increasing interest payments-to-revenue ratio; this is the guideline of the German constitutional court which has to declare the fiscal distress of the state to enable the bailout.

⁵ A more detailed description of the case of Leukerbad can be found in Blankart and Klaiber (2006).

obligations. Prior to the decision, the fiscal relations between the cantons and municipalities were not fully clear. Indeed, a federal law from 1947 excluded the possibility of a bailout; however, it also allowed the constitutions of the cantons to deviate from the clause, and this exemption was widely used on the cantonal levels (see Fasten 2006). Moreover, the cantons had a supervision duty regarding the public finances of their municipalities which also increased the probability of a bailout (see Feld and Kirchgässner 2008). As a matter of fact, the investors regarded the probability that cantons were obliged to help municipalities in financial distress as relatively high; Blankart and Klaiber (2006, p. 50) state that the creditors “thought that, if the municipality defaults, at least the canton (the state) will take over its obligation and bailout the municipality as could be expected in a mixed system”. However, after the court decision on July 3, 2003, it was resolved legally that cantons were not liable for unsustainable debt accumulation at the local level, so that the no-bailout clause became strongly binding and fully credible. Blankart and Klaiber (2006, p. 50) argue that the court decision “contributed to a complete wrap-up of the institutional organisation of the market for municipal and cantonal credits”. The decision thus led to a risk transfer from the cantonal to the municipal level.⁶

This leads us to the following hypotheses: (1) A punishment of Swiss cantons for serving as a potential bailout guarantor of municipal governments will be reflected in higher level cantonal yield spreads before July 3, 2003, the day of the court decision. (2) Moreover, we expect that before the court decision, cantonal risk premia positively depend on the fiscal situation of their municipalities; i.e., cantonal risk premia increase with a higher probability of municipal defaults which is reflected by their fiscal situation. This link between municipal budgetary positions and cantonal bond yields is expected to disappear after the court decision.

2.3. Fiscal Rules and Risk Premia

Fiscal rules should have an immediate effect on the risk premia of sovereign bonds if they convince the investors that the lower scope for discretion of fiscal policy reduces the future expansion of public finances, and, consequently, the danger of a default. In several instances, numerical fiscal rules have proven ex-post to fulfil the promised effects of improving fiscal indicators such as expenditures, revenue, deficits, and debt; this has been documented for the U.S. states (see, e.g., Alt and Lowry 1994; Bohn and Inman 1996; Elder 1992; Poterba 1994; Shadbegian 1999; von Hagen 1991), European countries (see, e.g., Ayuso-i-Casals, et al. 2007; Debrun and Kumar 2007; Debrun, et al. 2008; European Commission 2006) and also

⁶ Unpublished work by Fasten (2006) studies the hypothesised adverse effect on Swiss municipalities; based on time series evidence it cannot identify an immediate reaction of the markets to the court decision.

Swiss cantons (see, e.g., Feld and Kirchgässner 2001; Feld and Kirchgässner 2008; Krogstrup and Wälti 2008; Schaltegger 2002). However, for generating an immediate increase of trust among investors in a more sustainable fiscal policy, rules have to be regarded as strong and credible by the market participants. Possibly for this reason, the empirical findings on a strong role of fiscal rules regarding the risk assessment of sovereign bonds are generally still scarce.⁷ This can be easily explained by the fact that fiscal rules which are regarded as rather weak, such as the Stability and Growth Pact in the EU (see Afonso and Strauch 2007), can hardly be expected to restore trust among the investors and dampen risk premia.

Conclusive evidence in favour of an effect on financial markets is mainly based on studies for the U.S. states. One of the first studies for the U.S. which investigated the effect of state fiscal rules on the yields of state general obligation bonds is Poterba and Rueben (1997). Using an indicator reflecting the strength of fiscal rules in the states, the authors show that states with tighter deficit rules, and more restrictive provisions on the authority of state legislatures to issue debt, actually paid lower interest rates on their bonds. More specifically, their results suggest that the interest rate differential between states with a very strict anti-deficit constitution and one with a less strict anti-deficit constitution lies between 15 to 20 basis points. In the case of expenditure and revenue rules the authors come to similar conclusions; the quantitative effects on the bond spreads are, however, somewhat lower. In a related study Poterba and Rueben (2001) analyse the reaction of risk premia on unexpected deficit shocks. They find that tighter anti-deficit rules almost completely offset the effect of unexpected deficits on the yields on state governments bonds. Lowry and Alt (2001) show that investors are more forgiving of one-time deficits in states with strict fiscal rules (i.e., the bond yields increase significantly less after a deficit), but respond more sharply to consecutive deficits.

However, all of these studies do not utilise financial market data as it is the case in the studies on the determinants of yield differentials (see previous subsection) – or as we do in the following – but they base their findings on data from the “Chubb Relative Value Study”. These are surveys conducted by an insurance company in which 25 traders were asked to evaluate “hypothetical” general obligation bonds of the US states. This kind of survey-based data has obvious drawbacks as compared to market data: Johnson and Kriz (2005, p. 86) argue that “its

⁷ Apart from the studies investigating the effect of fiscal rules on bond spreads, there is another strand of literature which focuses on the relationship between fiscal institutions and yield differentials. For example, Hallerberg and Wolff (2008) show that better fiscal institutions like the strength of the finance minister are associated with lower risk premia.

surveyed New Jersey-based yield spreads fall far short of yields on actual market transactions” and they “are at best indirectly related to the interest costs faced by municipal borrowers in the primary market”. This is the only paper finding effects of state fiscal rules using actual financial market data. However, the effects are quantitatively much smaller compared to previous research using survey data: spending limits reduce interest costs by modest 2.4 basis points, debt limits by 3.3 basis points respectively.

The only related study in the European context is conducted by Iara and Wolff (2010). They analyse the relationship between numerical fiscal rules and government bond spreads for a panel of Euro area countries. Using the fiscal rule index provided by the European Commission (2006) they find only a very weak effect of fiscal rules on bond spreads. In particular, they are not able to identify a direct effect of fiscal rules on government bond spreads; the effect is only significant and sizeable in periods of extremely high risk aversion and, thus, possibly driven by particular developments during the financial crisis. Similarly, a report by the International Monetary Fund (2009) does not find that the presence of fiscal rules affects the spreads of 22 OECD countries. These findings suggest that the existing national fiscal rules of European and OECD countries are too weak or not credible enough to generate a strong effect on the investors’ trust.

This is one of the main distinguishing features of our study. As will be demonstrated in the following section, over the past decades most Swiss cantons have implemented different forms of fiscal rules, and many of these can be characterized as very strict and highly credible. Therefore, we expect a substantial negative effect of both the existence as well as the strength of cantonal fiscal rules on the respective bond yields. Moreover, we expect market penalisation of increasing deficits or debt to be smaller the stronger the cantonal fiscal constraints are.

3. Sub-National fiscal rules in Switzerland

3.1 Institutional Setting

Contrary to other OECD countries, the Swiss federal system is denoted by two particular characteristics: (1) Huge participation possibilities for the population, i.e. strong direct democratic elements both at the national and the sub-national level, and (2) a special kind of fiscal federalism leading to relatively strong autonomy of the different cantons. As a result,

fiscal institutions and thereby also fiscal rules differ substantially between the 26 cantons (Kirchgässner 2005). According to an agreement of the cantonal ministers of finance from 1981, the principle of a balanced budget has to be observed (Konferenz der Kantonalen Finanzdirektoren 1981). As a consequence, most of the cantons have implemented fiscal rules since then; however, the introduction of these rules happened at different points of time. Moreover, the specific configuration is up to the cantons. As a result, there are remarkable differences in the stringency of fiscal rules – both over time and between the several cantons.

While some cantons only refer to a mid-term balanced budget (“over the budget cycle”), other cantons trust on annual numerical standards, which have to be observed by the cantonal managers. The main difference, however, refers to the implemented mechanisms for a connection of budget planning and budget execution. This comes along with particular sanction mechanisms. The most important sanctions thereby are automatic tax adjustments (e.g. in Basle country, Fribourg, Neuchâtel, Nidwalden, Schwyz, Vaud and Zurich) and specified expenditure cuts (Aargau, Basle city). That is, if the deficit exceeds a certain threshold, there is an automatic adjustment of particular cantonal tax rates, imposing a severe sanction for acting politicians. As can be imagined, sanctions like these are highly effective (Schaltegger and Frey 2004). This stands in sharp contrast to the sanction mechanisms of national fiscal rules (see, e.g., European Commission 2006). These typically do not comprise explicit sanctions of the cantonal type (or sanctions are not very credible, such as in the case of the stability and growth pact of the EMU), so that in the end they only rely on implicit sanctions (such as reputation costs of the politicians).

Additionally, several cantons have defined exception standards which allow the canton to deviate from the specified arrangements. These exceptions take account of narrowly defined events like economic slumps or environmental disasters. Such exceptions tend to weaken the stringency of the rules, since they allow loopholes. Again, the cantons differ both with respect to implemented exemptions per se but also concerning the strength of the exception standards. While some cantons do not have any exceptions in place⁸, cantons like Fribourg or Valais set strict precepts for a deviation from the original budget plan (i.e. extraordinary cyclical strain must be given and an absolute majority of the parliament has to approve the new proposal). On the contrary, Geneva or Lucerne (“worse cyclical situation”) undermine their overall guidelines by implementing weak exception standards. These narrowly defined exception

⁸ Appenzell Inner Rhodes, Appenzell Outer Rhodes, Basle country, Glarus, Grisons, St Gall, Schaffhausen, Ticino and Uri

standards furthermore ensure strong compliance of budget planning with actual budget execution and a high credibility of the rules.

To sum up, cantonal fiscal rules in Switzerland as they have developed in the past 30 years can be regarded as much stronger as compared to existing national or sub-national fiscal rules in other countries. Especially the strong link between budget planning and budget execution, and the ex-ante defined sanction mechanisms (foremost automatic tax adjustments) in line with the overall fiscal framework in Switzerland, i.e., the strong implementation of direct democracy (e.g. the implementation of fiscal referenda on the expenditure side) impel this result. Moreover, these rules were introduced at different points of time; this significant time variation in the existence of cantonal fiscal rules will be shown in the following.

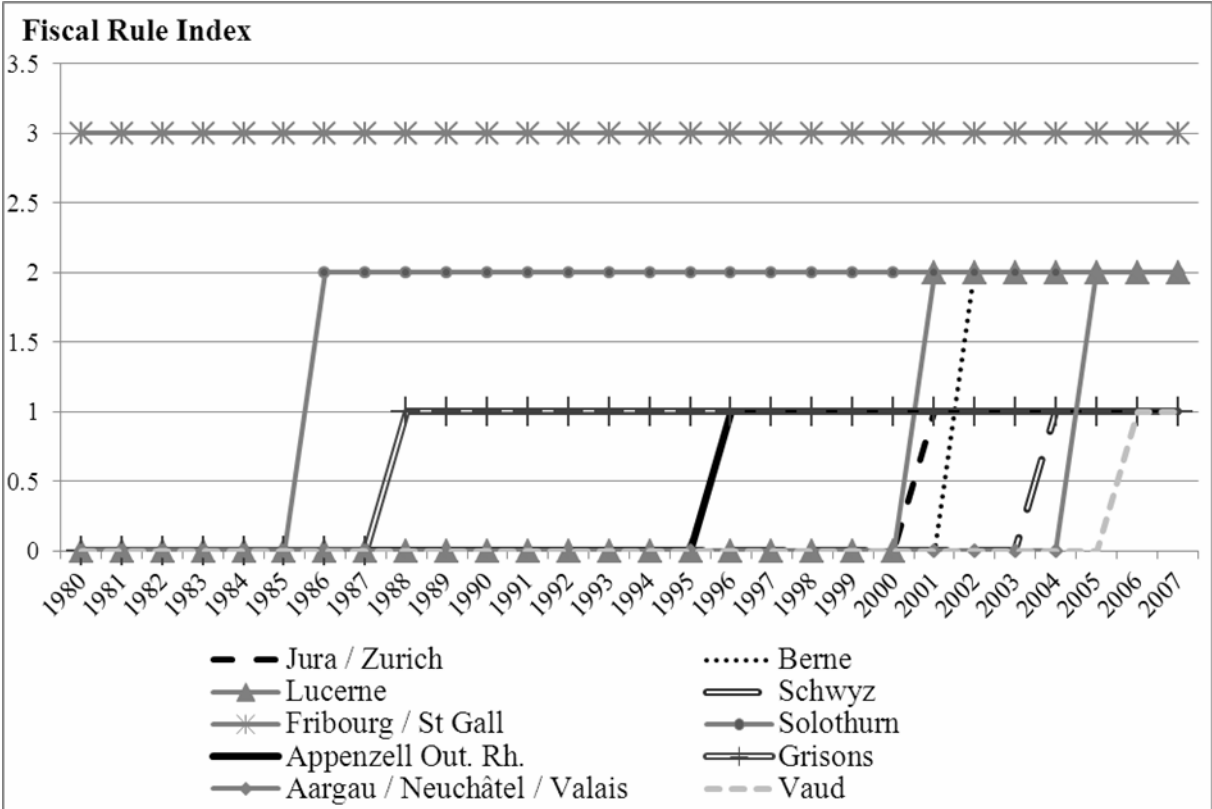
3.2 Fiscal Rules Index

Based on the peculiarities of the fiscal rules described above, it is now possible to group cantons according to the strength of their implemented fiscal rules and to describe their developments over time. Following Feld and Kirchgässner (2008), we make use of the stated three main components of strong cantonal fiscal rules in order to develop a compound fiscal rules indicator. First, there should be a strong connection of budget planning with actual budget execution; second, the canton should be characterised by strong numerical constraints and third, highly effective sanctions in the form of automatic tax adjustments have to be implemented. As a result, there are two cantons (St Gall and Fribourg), which are characterised by the most stringent fiscal rules in place. Both cantons fulfil all prerequisites stated above. The second group consists of Berne, Lucerne, Obwalden, Nidwalden, Solothurn, Aargau, Valais and Neuchâtel; in each of these cantons at least one of the main items is missing. The third group consists of the cantons Appenzell Outer Rhodes, Grisons, Jura, Schwyz, Vaud and Zurich; finally, the last category covers all cantons without (binding and legally defined) fiscal constraints.

We can now construct the fiscal rules indicator by making use of the before elaborated classification of cantons into four groups. In the following, we use an ordinal scale reaching from 3 (all three requirements fulfilled) up to zero (no requirement fulfilled; i.e. all cantons with no fiscal rules in place). The development of our fiscal rule indicator is depicted in Figure 1. The figure reveals that the fiscal rules in Fribourg and St Gall are highly persistent over time while most other cantons changed their institutional framework within the last twenty years. Most

cantons thereby strengthened their fiscal framework in the early 2000s; Solothurn, Grisons and also Appenzell Outer Rhodes already strengthened their rules in the mid-1980s and the mid-1990s, respectively. To sum up, the institutional characteristics – high stringency of the rules and variation between and within cantons – within the same constitutional environment make the Swiss cantons very suitable for studying the impact of fiscal rules on financial markets.

Figure 1: Development of the Fiscal Rule Index



Source: Feld and Kirchgässner (2008)
 The cantons Basel-Country, Basel-Town, Geneva, Thurgau and Ticino had no fiscal rules in place over the regarded period. For this reason, we have excluded these cantons from the figure.

In our empirical part, we follow two different approaches to appraise the effects of the cantonal fiscal rules. First, we employ the fiscal rules indicator based on the peculiarities described above, which has an ordinal scale reaching from 3 (strongest fiscal rules) up to zero (no fiscal rules in place). Second, we follow the strategy of Krogstrup and Wälti (2008) and create a dummy variable which is coded one if the fiscal rule index in a particular year is greater than zero (zero otherwise).

4. Empirical Analysis

4.1. Model Specification and Estimation Method

In order to investigate the determinants of the cantons' yield spreads we make use of the following estimation specification which is largely motivated by the literature on European bond spreads presented in subsection 2.1 (see, e.g., Schuknecht, et al. 2009):

$$(1) \quad \begin{aligned} \text{Yieldspread}_{i,j,t} = & \beta_0 + \beta_1 \mathbf{FR}_{j,t} + \beta_2 \mathbf{Debt}_{j,t} + \beta_3 \mathbf{Deficit}_{j,t} + \beta_4 \mathbf{Interactions}_{j,t} \\ & + \beta_5 \mathbf{Liquidity}_{i,j,t} + \beta_6 \mathbf{RiskAversion}_t + \beta_7 \mathbf{Duration}_{i,j,t} \\ & + \beta_8 \mathbf{NoBailout}_t + \beta_9 \mathbf{Timetrend}_t + \gamma_j + \varepsilon_{i,j,t}. \end{aligned}$$

As dependent variable we use the yield spreads of the cantonal bonds compared to Swiss federal bonds. The latter are chosen as reference values, since federal bonds account for country-specific influences on sovereign yields, such as monetary policy, exchange rate developments or country-wide political developments. Subtracting this common component of the cantonal bonds – expressed as the yield of federal bonds with a duration of 10 years – allows us to isolate the canton-specific effects. Therefore, the cantonal yield spreads are obtained from the difference of the yield of bond i of a particular canton j at time t to the average yield of the federal bonds. The time indicator t is included on a monthly basis to the estimation equation. To account for diverging maturities of the bonds, we restrict our sample to cantonal bonds with a time to maturity of eight to twelve years and, furthermore, control for the time to maturity in our regressions.

The incorporation of the control variables in equation (1) largely follows the standard approaches in the literature on sovereign bonds (see section 2). Firstly, we include the *debt* as well as the *deficit* of the cantons in order to control for the effect of the cantons' actual fiscal position and to account for the default risk which is reflected by the fiscal variables. Both variables are defined as a share of GDP.⁹ In addition, we include the aggregated *municipal deficit* in the respective canton in order to account for spillover effects from the fiscal situation of the municipalities.¹⁰ Moreover, the *liquidity* of the bonds is accounted for by including the issue volume of the respective bonds. If the market size for a certain security is rather small, inves-

⁹ Since information about cantonal GDP growth is not available, we use the federal growth rate in order to adjust the fiscal variables.

¹⁰ Data about municipal debt is not available; therefore we cannot include this variable.

tors request a higher liquidity premium; therefore, we expect the liquidity premium to be negatively related to the yield spreads. As a further explanatory variable we also include a measure for the general *risk aversion* in international bond markets. This variable is derived from the spread of low-grade US corporate bonds (grade “BBA”) to risk-free US federal bonds. It is expected that the higher this spread is, the greater is the general risk aversion in international bond markets, i.e., the higher is the investors’ request for a sufficient compensation of default risks. Finally, we include the *duration* of a particular bond to equation (1) assuming that yield spreads should be higher with an increasing maturity.

Our main variables of interest are the measures of fiscal rules (*FR*), its *Interactions* with the fiscal variables and the dummy variable *NoBailOut*. We study both the effects of the existence of fiscal rules – represented by a dummy variable which is coded one if a fiscal rule exists in a canton at a given point of time – and the strength of fiscal rules (fiscal rule index, see section 3) on the bond spreads. In order to test the hypothesis whether market penalisation of increasing deficits or debt is smaller the stronger the cantonal fiscal constraints are, we further interact the fiscal variables (deficit and debt) with the dummy variable for the existence of fiscal rules as well as with the fiscal rule index. In addition, the dummy variable *NoBailOut* is included to equation (1) to test the hypothesis whether the cantonal risk premia decreased in the aftermath of July 3, 2003, the day of the Supreme court decision excluding the bailout of Swiss municipalities by the cantons. Finally, the *NoBailOut* variable is further interacted with the deficit level of the cantons’ municipalities in order to test whether the spillover effect from municipal indebtedness changed after the Leukerbad court decision.

We estimate an unbalanced panel, since there are cantons which are tabbed with several bonds i at time t ; on the other hand, there are also periods for particular cantons without any bonds issued. To cope with the problem of canton-specific unobserved effects, we include cantonal dummies to control for cantonal effects which are time-invariant, such as language or culture. In our robustness checks, we will furthermore account for possibly time-varying influences. These can be captured by an indicator about voters’ preferences for the size of the public sector in the Swiss cantons which is provided by Funk and Gathmann (2010). In addition, a time trend variable is included to control for general changes of risk evaluation over time. Since our data structure would result in biased standard errors based on autocorrelation of the error term between bonds issued in the same canton, the error terms are clustered on cantonal-year levels and corrected for heteroscedasticity.

4.2. Data and Descriptive Statistics

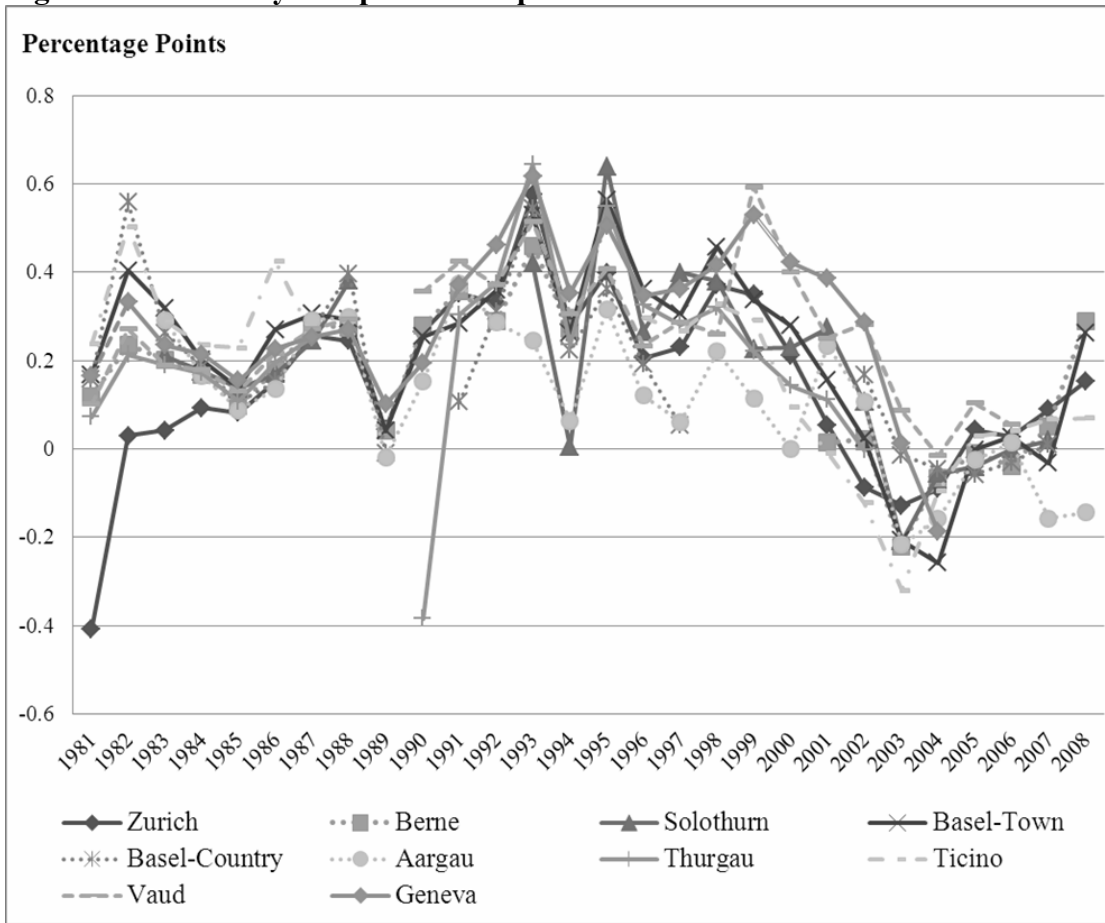
Our empirical analysis is based on data for the period of 1981 to 2007 and covers 19 out of the 26 Swiss cantons.¹¹ These are the cantons which issued traded bonds in the period mentioned above. Taken together, the overall sample consists of 308 cantonal bonds. The average yield spreads (on a yearly basis) of the largest emitting cantons compared to the federal level are presented in Figure 2.¹² As can be seen from the figure the yield spreads are – with few exceptions – positive, whereas maximum premiums reached up to 60 basis points in the mid-1990s. At the beginning of the last decade, however, the cantonal yield spreads started to decrease until 2003. This decrease exactly coincides with both the introduction of several cantonal rules but also with the Leukerbad court decision on July 3, 2003. Especially the latter event seems to change the financial markets perceptions about the relative risk structure concerning cantonal vs. federal bonds, thus leading to a period of risk moderation of cantonal bonds. Finally, the increasing and diverging yield spreads at the end of the time series reflect the upcoming financial crisis.

Figure 3 presents the indicator on the risk aversion in international bond markets. The indicator is constructed by comparing average US corporate bond yields with a Moody's "BAA" rating with average yields of ten year US Treasury bonds. Higher spreads thereby indicate a higher general risk aversion. This is the standard approach employed by studies investigating risk premiums in international bonds markets. The comparison of Figure 2 and Figure 3 shows that cantonal yield spreads in Switzerland basically changed in line with international risk aversion. To facilitate the comparison, Figure 3 also contains a simple time series on the development of the annual average cantonal yield spreads of those cantons shown in Figure 2. In particular, the development of the average cantonal bonds spreads for the period from 1981 until the mid-1990s is in line with the development of the general risk aversion. Subsequently, however, cantonal bond spreads seem to decouple from international trends. While general risk aversion of financial markets started to increase strongly from 1997 on, and further intensified after 2001, yield spreads at the cantonal level did not follow this development. A summary of the descriptive statistics of all variables used in the analysis is provided in Table 1.

¹¹ These are Aargau, Appenzell Outer Rhodes, Basel-Country, Basel-Town, Berne, Fribourg, Geneva, Grisons, Jura, Lucerne, Neuchâtel, Schwyz, Solothurn, St Gall, Ticino, Thurgau, Vaud, Valais, and Zurich.

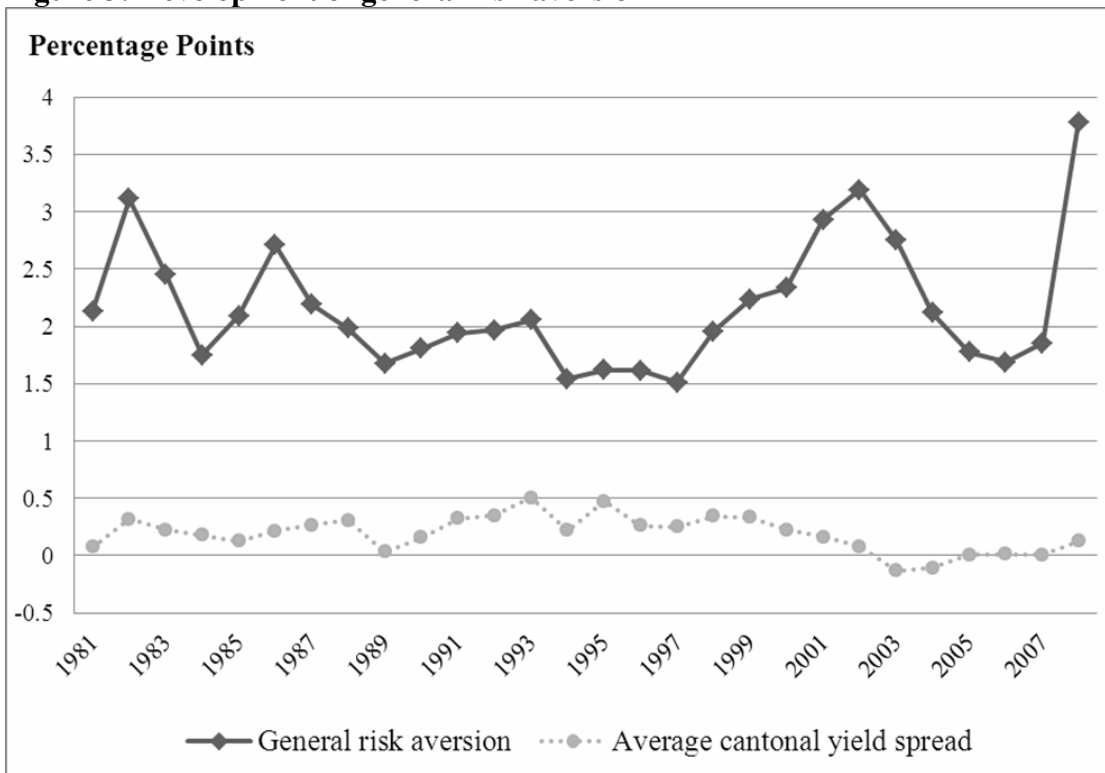
¹² Since several cantons have issued bonds only within specific periods, showing the full set of all average yield spreads is not much demonstrative with respect to a description of a general trend.

Figure 2: Cantonal yield spreads compared to Swiss federal bonds



Datastream (own calculations)

Figure 3: Development of general risk aversion



Datastream (own calculations)

Table 1: Descriptive Statistics

Variable	Unit	Frequency	Obs	Mean	Std. Dev.	Min	Max
Yield Spread	Percentage points (reference: Swiss federal bonds)	month	7,919	0.232	0.267	-2.292	1.690
Debt Canton	Share in GDP	year	697	0.123	0.106	0.023	0.813
Deficit Canton	Share in GDP	year	698	0.001	0.009	-0.051	0.054
Deficit Municipalities	Share in GDP	year	698	0.000	0.004	-0.015	0.018
Liquidity	Issue volume (bond denomination: 1,000,000 units)	month	7,919	0.124	0.103	0.018	0.750
Risk Aversion	Percentage points (yield US corporate minus yield US Treasury bonds)	month	324	2.111	0.534	1.290	3.820
Duration	Years	month	7,919	9.453	0.989	8	12
Dummy Fiscal Rule	Dummy variable	year	513	0.292	0.455	0	1
Fiscal-Rule-Index	Ordinale scale (3: strongest fiscal rules; 0: no fiscal rule)	year	513	0.589	1.023	0	3
No-bailout	Dummy Variable	month	324	0.167	0.270	0	1
Fiscal Preferences	Index	year	324	0.749	7.506	-19.156	35.889
Mandatory Referendum	Dummy variable	year	475	0.587	0.493	0	1
Spending Threshold	Swiss Francs	year	475	3,818,275	6,838,388	0	25,000,000
Signature Requirement	Number of signatures	year	475	4,934	3,410	1	15,000

4.3. Results

The results of the empirical analysis are shown in Table 1. Column (1) presents the results for the baseline specification where only the standard control variables are used. It can be seen that the signs of almost all coefficients in column (1) are in line with the results of previous studies for the U.S. or Europe (see also section 2). The coefficient of the cantonal debt is positive and highly significant in all specifications; this is also true for the coefficients of the deficit variables – on the cantonal as well as the municipal level. Our results suggest that an increase of the cantonal debt by 1% of its GDP induces the yield spread to rise by approximately 0.9 basis points. The effect on the municipal level even turns almost at the same level; however, this does not imply that municipals' fiscal situation is equally important for investors regarding the evaluation of default risks of cantonal bonds as the cantonal fiscal situation, since the latter is reflected in the conjoint effect of cantonal debt and deficit. Furthermore, the coefficients of the variables for the market liquidity and the international risk aversion show the expected signs and are mostly statistically significant; an increase of the yield spread between low grade US corporate bonds (“BAA”) and benchmark US government bonds by one percentage point leads to an increase in the cantonal bond spreads by approximately 8 basis points. Finally, the duration of the bonds does not have a sizeable effect on the spreads which seems reasonable given that our sample is restricted to a very narrow margin of durations around 10 years in which the yield curve is usually very flat.

Table 1: Cantonal Fiscal Institutions and Bond Yield Spreads: Baseline Regressions

Dep. Var.: Cantonal Bond Spread	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Debt Canton	0.866*** (3.891)	0.729*** (3.363)	0.793*** (3.657)	0.760*** (3.426)	0.798*** (3.607)	0.706*** (3.217)	0.798*** (3.645)	0.449** (2.179)	0.410** (2.003)
Deficit Canton	6.128*** (5.598)	5.527*** (4.955)	5.598*** (5.047)	5.515*** (4.950)	5.596*** (5.041)	5.761*** (5.072)	5.542*** (4.863)	4.929*** (4.705)	4.944*** (4.737)
Deficit Municipalities	5.728** (2.155)	5.286** (2.104)	5.296** (2.075)	5.379** (2.135)	5.308** (2.079)	5.361** (2.142)	5.274** (2.069)	4.970** (2.074)	5.660** (2.295)
Liquidity	-0.303** (-2.040)	-0.194 (-1.491)	-0.252* (-1.876)	-0.186 (-1.439)	-0.250* (-1.867)	-0.173 (-1.337)	-0.256* (-1.913)	-0.0104 (-0.0793)	0.0410 (0.313)
Risk Aversion	0.0829*** (4.897)	0.0889*** (5.086)	0.0893*** (5.122)	0.0905*** (5.147)	0.0894*** (5.127)	0.0888*** (5.106)	0.0894*** (5.123)	0.0841*** (4.746)	0.0849*** (4.796)
Duration	-0.00756 (-1.091)	-0.00679 (-0.993)	-0.00693 (-1.018)	-0.00696 (-1.019)	-0.00694 (-1.020)	-0.00662 (-0.967)	-0.00701 (-1.029)	-0.00263 (-0.387)	-0.00286 (-0.421)
Dummy Fiscal Rule		-0.170*** (-3.997)		-0.0505 (-0.508)		-0.176*** (-4.219)			
Fiscal-Rule-Index			-0.101*** (-3.936)		-0.0906 (-1.646)		-0.0997*** (-3.804)	-0.0522** (-2.030)	-0.0534** (-2.130)
Dummy Fiscal Rule * Debt Canton				-1.033 (-1.256)					
Fiscal-Rule-Index * Debt Canton					-0.0823 (-0.198)				
Dummy Fiscal Rule * Deficit Canton						-3.034 (-0.832)			
Fiscal-Rule-Index * Deficit Canton							0.474 (0.241)		
No-bailout								-0.255*** (-6.807)	-0.277*** (-7.008)
No-bailout * Deficit Municipalities									-15.85* (-1.739)
Time Trend	0.00213 (1.090)	0.00391* (1.874)	0.00412* (1.943)	0.00370* (1.774)	0.00407* (1.915)	0.00374* (1.794)	0.00416** (1.976)	0.00646*** (3.339)	0.00607*** (3.136)
Number of Observations	7,919	7,919	7,919	7,919	7,919	7,919	7,919	7,919	7,919
R ²	0.133	0.145	0.144	0.146	0.144	0.146	0.144	0.170	0.172

Note: All specifications include canton-specific fixed effects (canton dummies). Robust t-values in parentheses. *** (**) (*) denotes significance at the 1-, (5-), (10-)%-level. Clustered error terms on canton-level per year.

Turning now to the central fiscal rules variables, Table 1 shows that both the existence and the strength of numerical fiscal rules add significantly to the explanatory power of the model. A first conclusion clearly is that numerical fiscal rules matter regarding the confidence of market participants. In particular, our results indicate that the pure existence of a numerical fiscal rule in a Swiss canton is accompanied by a yield spread which is on average 17 basis points lower than in cantons without fiscal rules. Moreover, the stricter the existing rule in one canton, the lower is the yield spread: the results in column (3) suggest that cantons with stricter fiscal rules are on average associated with yield spreads up to 30 basis points lower than cantons without fiscal rules.

In columns (4) to (7) we additionally test the effect of the interactions of the fiscal rule variables with the fiscal variables, i.e. debt and deficit. As can be seen from the table, the interactions with the fiscal rules dummy are negative indicating that increases in the deficit or debt levels of cantons with numerical fiscal rules induce cantonal yield spreads to increase not as strong as for cantons without fiscal rules. Or, in other words: regarding risk premia, increasing deficit or debt levels are punished less in cantons with numerical fiscal rules. However, the coefficients of these interactions miss statistical significant, in particular in those specifications applying the fiscal rule index. Nevertheless, these results give some support to the hypothesis that governments with fiscal rules enjoy higher confidence among the market participants.

In column (8) we test for the effect of the risk transfer after the Leukerbad court decision (“no-bailout regime”) in July 2003 on the cantonal yield spreads. As can be seen from the table, the coefficient in column (8) indicating the no-bailout regime after the court decision shows a statistically significant negative effect on the yield spreads of the cantons: after the decision the spread between the yields of cantonal and federal bonds was on average up to 25 basis points lower than before the decision. This result confirms the hypothesis that prior to the court decision the cantons had to pay higher risk premia due to their (potential) liability for municipalities located in their cantons. The interaction of the “*No-Bailout*” dummy with the deficit of the municipalities further shows that – after the court decision – cantonal yield spreads decreased as a direct response to increases in municipal deficit levels. This reflects that the link between cantonal yields and the fiscal situation of their municipalities was dissolved after the court decision.

In the following robustness checks, we first want to address concerns which may arise due to potential endogeneity of fiscal rules. In any analysis of fiscal institutions, an omitted variable bias cannot fully be excluded, since fiscal institutions are not fully exogenous and also depend on the preferences of the voters or legislatures. However, in the Swiss context, this problem seems to be of minor importance than in cross-country studies, because preferences within a country can be assumed to be more homogenous than between countries. Since we add cantonal dummies in our regression model, we further explicitly control for time-invariant influences (such as cultural factors or long-term preferences of the citizens in the cantons).

Moreover, in order to explicitly account for possibly time-varying preferences of the citizens, in the following we make use of the fiscal preferences measure provided by Funk and Gathmann (2010) in our estimation equation.¹³ Column (1) of Table 2 shows the results of the re-estimation using the fiscal rules index. As can be seen from the table, the fiscal preferences indicator has no significant effect on bond spreads, whereas the coefficients for our fiscal rules variable as well as the no-Bailout variable remain negative and highly statistically significant. This suggests that taking into account time-varying voter preferences does not substantially affect the impact of our main variables on the cantonal yield spreads. Moreover, both coefficients change only by a relatively small amount of less than one basis point. Overall, we therefore find no evidence that changes of the preferences of the voters are interfering with the qualitative or quantitative impact of fiscal rules or the no-bailout regime on bond spreads.

Since the political system of Switzerland is strongly influenced by its strong direct democratic elements, we furthermore control for the effects of direct democracy. It has already been demonstrated in the literature that direct voter participation increases fiscal austerity in Swiss cantons (see, e.g., Funk and Gathmann, forthcoming); consequently, a link between direct democracy and market confidence seems to be reasonable. Therefore, we include variables reflecting differences in levels of direct democracy in the cantons to the estimation specification. We add three direct democratic variables which have become standard in the analysis of direct democracy in Switzerland (see, e.g., Feld and Matsusaka 2003): (1) A dummy variable which indicates whether there are *mandatory referendums* – in which a majority of all voters have to approve a proposal – on spending projects in the canton, (2) a variable indicating the

¹³ This indicator is based on voting data of 331 federal ballot propositions. It measures the preferences for government spending of each canton's inhabitants, and it is demonstrated to have a sizable effect on government spending even conditional on observable characteristics.

spending threshold, i.e., the lower limit of project costs which enforces a mandatory referendum, and (3) a variable representing the *signature requirement*, i.e., the number of signatures required for an initiative process, which allows citizens to propose entirely new laws which will then be subject to a referendum. A positive value of (1) represents stronger participation rights of the citizens, whereas positive values of (2) and (3) have the opposing meaning since they hamper the participation of the citizens in political decisions in their canton.

The results are shown in columns (2) and (3) of Table 2 – with and without the fiscal preferences indicator, respectively. It can be seen that none of the proxy variables for the strength of direct democracy at the cantonal level has a significant effect on the risk premia. Moreover, the table reveals that the coefficients of the fiscal rules indicator as well as the no-bailout regime are not affected considerably; the coefficients still remain negative and statistically highly significant. Therefore, taking into account direct democratic elements of the cantons also does not change our main results, namely, that governments with (stricter) fiscal rules enjoy higher confidence among the market participants which is represented by lower yield spreads.¹⁴

Finally, we show that the negative effect of the no-bailout dummy can actually be ascribed to a changed risk assessment of the cantonal level, and is not caused by contemporaneous developments at the federal level. In columns (4) and (5) we replace the values of the debt and deficit variables with their spreads relative to the debt and deficit values for the federal level. The effects of our main variables are largely unaffected by this modification, so that we can conclude that the slump of cantonal bond spreads relative to federal bonds after the Leukerbad decision was not due to a deterioration of the federal fiscal situation at that time.

¹⁴ Note that we conducted further robustness tests where we included nominal values of the fiscal variables. Using nominal instead of GDP adjusted fiscal variables changes the results only marginally. Moreover, the results still hold, if we include lagged instead of real fiscal variables (deficit and debt levels) to the estimation equation (Results are available upon request).

Table 2: Cantonal Fiscal Institutions and Bond Yield Spreads: Robustness Checks

Dep. Var.: Cantonal Bond Spread	(1)	(2)	(3)	(4)	(5)
Debt Canton	0.445** (2.156)	0.496** (2.314)	0.491** (2.281)	0.618*** (2.939)	0.631*** (2.997)
Deficit Canton	4.906*** (4.763)	5.039*** (4.699)	5.004*** (4.750)	1.386 (1.353)	1.049 (0.999)
Deficit Municipalities	5.129** (2.112)	4.978** (2.010)	5.120** (2.039)	-7.102*** (-5.329)	-7.587*** (-5.564)
Liquidity	0.0109 (0.0802)	-0.0377 (-0.280)	-0.0144 (-0.103)	-0.0549 (-0.385)	-0.0497 (-0.327)
Risk Aversion	0.0855*** (4.682)	0.0872*** (4.854)	0.0886*** (4.774)	0.0912*** (5.069)	0.0984*** (5.308)
Duration	-0.00289 (-0.424)	-0.00422 (-0.612)	-0.00448 (-0.648)	-0.00183 (-0.275)	-0.00375 (-0.561)
Fiscal-Rule-Index	-0.0562** (-2.133)	-0.0658** (-2.005)	-0.0691** (-2.080)	-0.0647** (-2.418)	-0.0731** (-2.207)
No-bailout	-0.255*** (-6.817)	-0.271*** (-7.082)	-0.271*** (-7.112)	-0.202*** (-4.519)	-0.216*** (-4.939)
Fiscal Preferences	-0.000735 (-0.634)		-0.000710 (-0.607)		-0.000252 (-0.248)
Mandatory Referendum		-0.225 (-0.840)	-0.211 (-0.781)		-0.164 (-0.566)
Spending Threshold		1.16e-08 (0.917)	1.11e-08 (0.868)		1.11e-08 (0.801)
Signature Requirement		-1.09e-05 (-0.761)	-1.04e-05 (-0.719)		-9.11e-06 (-0.584)
Time Trend	0.00642*** (3.323)	0.00633*** (3.017)	0.00629*** (3.004)	0.00797*** (3.774)	0.00757*** (3.319)
Number of Observations	7,919	7,746	7,746	7,919	7,746
R ²	0.171	0.166	0.166	0.172	0.171

Note: All specifications include canton-specific fixed effects (canton dummies). Robust t-values in parentheses. *** (***) (*) denotes significance at the 1-, (5-), (10-)%-level. Clustered error terms on canton-level per year.

5. Conclusions

Text

References

- Afonso, A., and R. Strauch, 2007. Fiscal Policy Events and Interest Rate Swap Spreads: Evidence from the EU, *Int. Fin. Markets, Inst. and Money* 17, 261-276.
- Alt, J., and R. Lowry, 1994. Divided Government, Fiscal Institutions, and Budget Deficits: Evidence from the States, *The American Political Science Review* 88, 811-828.
- Attinasi, M.-G., C. Checherita, and C. Nickel, 2009. *What explains the surge in euro area sovereign spreads during the financial crisis of 2007-09?*(European Central Bank, Frankfurt).
- Ayuso-i-Casals, J., X. Debrun, M. Kumar, L. Moulin, and A. Turrini, 2007. *Beyond the SGP - Features and Effects of EU National-Level Numerical Fiscal Rules*(Lisbon).
- Bayoumi, T., M. Goldstein, and G. Woglom, 1995. Do Credit Markets Discipline Sovereign Borrowers? Evidence from U.S. States, *Journal of Money, Credit and Banking* 27, 1046-1059.
- Blankart, C. B., and A. Klaiber, 2006. Subnational Government Organisation and Public Debt Crises, *Economic Affairs* 26, 48-54.
- Bohn, H., and R. Inman, 1996. *Balanced Budget Rules and Public Deficits: Evidence from the U.S. States*.
- Booth, L., G. Georgopoulos, and W. Hejazi, 2007. What drives provincial-Canada yield spreads?, *Canadian Journal of Economics* 40, 1008-1032.
- Codogno, L., C. Favero, and A. Missale, 2003. Yield Spreads on EMU Governments Bonds, *Economic Policy*, 505-532.
- Debrun, X., and M. Kumar, 2007. *Fiscal Rules, Fiscal Councils and All That: Commitment Devices, Signaling Tools or Smokescreens?*(Banca d'Italia).
- Debrun, X., L. Moulin, A. Turrini, J. Ayuso-i-Casals, and M. Kumar, 2008. Tied to the Mast? National Fiscal Rules in the European Union, *Economic Policy* 23, 297-362.
- Dell'Araccia, G., I. Schnabel, and J. Zettelmeyer, 2006. How Do Official Bailouts Affect the Risk of Investing in Emerging Markets?, *Journal of Money, Credit and Banking*. 38, 1689-1714.
- Ejsing, J., and W. Lemke, 2001. The Janus-headed salvation: Sovereign and bank credit risk premia during 2008–2009, *Economics Letters* 110, 28-31.
- Elder, H., 1992. Exploring the Tax Revolt: an Analysis of the Effects of State Tax and Expenditure Limitation Laws, *Public Finance Review* 20.
- European Commission, 2006. Public Finances in EMU 2006, *European Economy* 3/2006, Brussels.
- Fasten, E. R., 2006. Market Mechanisms to Restrict Irresponsible Politicians - Lessons from Switzerland, *Paper presented at the EPCS 2006, Turku, Finland*.
- Feld, L. P., and G. Kirchgässner, 2001. The Political Economy of Direct Legislation: Direct Democracy and Local Decision-Making, *Economic Policy* 16, 329.
- Feld, L. P., and G. Kirchgässner, 2008. *On the Effectiveness of Debt Brakes: The Swiss Experience*(MIT Press, Cambridge/London).
- Feld, L. P., and J. G. Matsusaka, 2003. Budget referendums and government spending: Evidence from Swiss cantons, *Journal of Public Economics* 87, 2703– 2724.
- Funk, P., and C. Gathmann, 2010. Preferences Matter! Voter Preferences, Direct Democracy and Government Spending, unpublished manuscript.
- Goodspeed, T. J., 2002. Bailouts in a Federation, *International Tax and Public Finance* 9, 409–421.
- Hallerberg, M., and G. Wolff, 2008. Fiscal institutions, Fiscal Policy and Sovereign Risk Premia in EMU, *Public Choice* 136, 379-396.

- Heppke-Falk, K. H., and G. B. Wolff, 2008. Moral Hazard and Bail-Out in Fiscal Federations: Evidence for the German Länder, *Kyklos* 61, 425-446.
- Iara, A., and G. Wolff, 2010. Rules and Risk in the Euro Area: Does Rules-Based National Fiscal Governance Contain Sovereign Bond Spreads?, *European Economy: Economic Papers* 433, 2-28.
- International Monetary Fund, 2009. *Fiscal Rules - Anchoring Expectations for Sustainable Public Finances*(International Monetary Fund: Fiscal Affairs Department).
- Johnson, C., and K. Kriz, 2005. Fiscal Institutions, Credit Ratings, and Borrowing Costs, *Public Budgeting & Finance* 25, 84-103.
- Kirchgässner, G., 2005. Sustainable Fiscal Policy in a Federal State: The Swiss Example, *Swiss Political Science Review* 11, 19-46.
- Konferenz der Kantonalen Finanzdirektoren, 1981. *Handbuch des Rechnungswesens der öffentlichen Haushalte, Volume I*(Paul Haupt, Berne).
- Kopits, G., and S. Symansky, 1998. *Fiscal Policy Rules*(International Monetary Fund).
- Krogstrup, S., and S. Wälti, 2008. Do Fiscal Rules Cause Budgetary Outcomes?, *Public Choice* 136, 123-138.
- Küttel, D., and P. Kugler, 2002. Explaining yield spreads of Swiss canton bonds: An empirical investigation, *Financial Markets and Portfolio Management* 16, 208-218.
- Landon, S., and C. E. Smith, 2000. Government debt spillovers and creditworthiness in a federation, *Canadian Journal of Economics* 33, 634-661.
- Lowry, R., and J. Alt, 2001. A Visible Hand? Bond Markets, Political Parties, Balanced Budget Laws, and State Government Debt, *Economics & Politics* 13, 49.
- Manganelli, S., and G. Wolswijk, 2009. What Drives Spreads in the Euro Area Government Bond Market?, *Economic Policy* 48, 191-240.
- Oates, W. E., 2005. Toward A Second-Generation Theory of Fiscal Federalism, *International Tax and Public Finance* 12, 349-373.
- Poterba, J., 1994. State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics, *The Journal of Political Economy* 102, 799.
- Poterba, J., and K. Rueben, 1997. *State Fiscal Institutions and the U.S. Municipal Bond Market*.
- Poterba, J., and K. Rueben, 2001. Fiscal News, State Budget Rules, and Tax-Exempt Bond Yields, *Journal of Urban Economics* 50, 537-562.
- Schaltegger, C., 2002. *Budgetregeln und ihre Wirkung auf die öffentlichen Haushalte: Empirische Ergebnisse aus den US-Bundesstaaten und den Schweizer Kantonen*(Duncker & Humboldt, Berlin).
- Schaltegger, C., and R. L. Frey, 2004. Fiskalische Budgetbeschränkungen zur Stabilisierung öffentlicher Haushalte, *Die Volkswirtschaft* 2, 16-19.
- Schuknecht, L., J. von Hagen, and G. Wolswijk, 2009. Government Risk Premiums in the Bond Market: EMU and Canada, *European Journal of Political Economy* 25, 371-384.
- Schulz, A., and G. B. Wolff, 2009. The German Sub-national Government Bond Market: Structure, Determinants of Yield Spreads and Berlin's Forgone Bail-out, *Jahrbücher für Nationalökonomie und Statistik (Journal of Economics and Statistics)* 229, 61-83.
- Shadbegian, R., 1999. Fiscal Federalism, Collusion, and Government Size: Evidence from the States, *Public Finance Review* 27, 262-281.
- Stauffer, T., 2001. *Instrumente des Haushaltsausgleichs: Ökonomische Analyse und Rechtliche Umsetzung*(Helbing und Lichtenhahn, Basel).
- Task Force on Economic Governance, 2010. *Strengthening Economic Governance in the EU*(European Council, Brussels).
- von Hagen, J., 1991. A Note on the Empirical Effectiveness of Formal Fiscal Restraints, *Journal of Public Economics* 44, 191-210.

- von Hagen, J., L. Schuknecht, and G. Wolswijk, 2010. Government bond risk premiums in the EU revisited: The impact of the financial crisis, *European Journal of Political Economy*.
- Wildasin, D. E., 1997. *Externalities and Bailouts: Hard and soft budget constraints in intergovernmental relations*(World Bank Development Research Group).