

Interaction of government tiers and central banks in a federation: an empirical test *

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Abstract

Fiscal rules are necessary to protect monetary policy from the consequences of unsustainable or active fiscal policy on inflation. Monetary unions, like the EMU, require even stronger fiscal rules to avoid free riding by regional fiscal authorities on the common monetary policy. By contrast, in a fiscal federation, a federal government internalises the effect of active regional policies on the overall price level. Federal fiscal policy contributes to price stability by enforcing fiscal rules or adjusting its own stance. Following Canzoneri *et al.* (2001), we test if federal and regional government in Germany are active or passive. We find evidence of a spillover effect of unsustainable policies on other regions. The German federal government offsets the effect on the price level by running passive policies. The results have implications for the regulation of fiscal policies in the EMU.

JEL: E61, E62, H11, H72, H77.

Keywords: sustainability, debt, fiscal policy, FTPL, fiscal federalism.

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1 Introduction

In June 2011, the then president of the European Central Bank, Jean-Claude Trichet, during a speech on receiving the Charlemagne Prize called for the creation of a ministry of finance for the Eurozone. His call for more powers for a European Treasury sounded unusual for a central banker. Economic theory has usually considered that a central bank, concerned about inflation, should be wary of a strong fiscal authority. As the argument goes, governments that are soft-nosed about employment wish to stimulate economic activity and therefore strain the central bank by pressuring for lower interest rates or higher inflation (Barro and Gordon, 1983; Svensson, 1997). Easier monetary conditions would also take off the pressure of a loose fiscal stance and make it easier to run debt-financed deficits. According to the Fiscal Theory of the Price Level (FTPL), if the government fails to take action to ensure solvency, then monetary policy can only give in to this active use of fiscal policy and eventually loses control over the price level. Fiscal – rather than monetary – policy determines the price level then (Leeper, 1991; Sims, 1994). Economists are therefore concerned with making central bankers sufficiently conservative on price stability, and restricting the manoeuvring room of governments with fiscal rules.¹

This is all the more necessary in a monetary union (Dixit, 2001; Chari and Kehoe, 2004). The common central bank faces various fiscal authorities who wish to shift the economic and political cost of fiscal adjustment from the local population onto the rest of the union. A monetary bail out by the central bank would generate inflation for all countries, and it is sufficient to have one insolvent government that sets policy actively to have it determine the price level for the union as a whole (Bergin, 2000).² ³ This free riding exacerbates the need to control fiscal profligacy with fiscal rules (Beetsma and Uhlig, 1999). The common central bank should be as conservative as possible in order not to give in to the pressure of debt accumulation (Chari and Kehoe, 2004).⁴ One way to achieve a strong common central bank is by keeping the fiscal authorities divided. Beetsma and Bovenberg (1998) or Chari and Kehoe (2004) argue that the absence of a single fiscal power reinforces the position of the single central bank, since there can be no direct bail out and free riding also weakens possible agreements between various fiscal authorities on how to share the burden of a bail out. In the Economic and Monetary Union

¹Dixit and Lambertini (2003) qualify this result for more general settings on the policy game.

²Except in the case in which this price level would be exactly right to offset the debt position of other governments.

³The FTPL has been extended to open economies by Dupor (2000) and Daniel (2001), and to explain first generation currency crises (Daniel, 2010) or constraints on fiscal policy in monetary union by Sims (1999), Woodford (2001) and Daniel and Shiamptanis (2012).

⁴Failure to commit results in excessive debt accumulation (Jensen, 1996; Beetsma and Bovenberg, 2003).

(EMU), an inexistent EU budget together with the deficit rule of the Stability and Growth Pact (or after its 2012 reform, the Fiscal Compact) and the no-bail out clause of the Treaty, was supposed to separate responsibilities between the various national fiscal policies and seal in price stability as the sole objective of the European Central Bank.

Given these settings, the European Central Bank is arguably the most powerful institution in the Eurozone. Some argue it uses this political power to push its own agenda of economic and institutional reform (Bergsten and Kierkegaard, 2011). So why would the European Central Bank push for the creation of a single fiscal authority that would diminish its privileged position? The game-theoretic models on policy interaction, which give a rationale for the creation of a strong central bank, have typically downplayed the possibility of fiscal transfers between fiscal authorities. A crucial assumption in Chari and Kehoe (2004) is that the fiscal authorities can only ask the common central bank for a monetary bail out, whereas a fiscal bail out between them is not possible. The implicit argument is that a sovereign cannot be asked to tax its own citizens to finance public goods and transfer wealth permanently to citizens in other countries (Sims, 1999). By contrast, in a federation, this limit is not binding and transfer systems do exist. The literature on fiscal federalism examines why regions free ride on the fiscal efforts of the federation as a whole. Regional tax autonomy is rarely complete - due to a constitutionally determined division of spending tasks across tiers of government and varying economic conditions that cause differences in tax capacity - so revenue sharing agreements, which consist either in horizontal transfers between regional governments or vertical transfers from the federal government, open the door to fiscal indiscipline.⁵ Soft budget constraints make that *ex ante*, tax sharing agreements and joint spending schemes provide implicit additional financing of regional budgets. *Ex post*, in extreme cases, this may even entail an explicit bail out. Policy recommendations for fiscal federations are akin to the ones for monetary union: if tax autonomy is not possible, federal governments should have a politically stronger position to enforce fiscal rules and constrain regional debt accumulation (Rodden *et al.*, 2003; Ter-Minassian, 2007).

With a strong central bank or a strong federal treasury, fiscal discipline and economic stability can be achieved. But if one of them becomes weak towards regional fiscal authorities, perhaps because of the negative economic consequences of a default by a fiscal authority, then commitment by the other may still be sufficient for fiscal discipline and economic stability. On the one hand, the federal government can act on regional budgets so as to shield the central bank from the negative consequences of active fiscal policies. If it is strong, it can force the region to adjust by applying fiscal rules. But even if it is weak and likely to bail out, it may still achieve overall budget balance by compensating for insolvency at the regional level with

⁵The variety of fiscal arrangements and rules in different countries is discussed in Rodden *et al.* (2003).

a stricter central budget or alternatively, by shifting resources between regional governments. Active regional fiscal policies do not give rise to pressures on the central bank then, as the general government budget is balanced and so price stability is achievable for the central bank. On the other hand, the central bank can stand firm and not provide a monetary bail out to the regions and thereby also reinforce the negotiating position of the federal government *vis-à-vis* the regions.

Of course, a strong federal treasury may grow as a challenger to the central bank. A soft-nosed federal government may perhaps wish to force a looser monetary stance, as the literature on the interaction between a central bank and the government shows (Belke and Gros, 2009). But this policy conflict is subdued in the presence of a third player that may cause negative externalities on the two other players. The latter will cooperate to beat the third player rather than engage in a row between them (Rogoff, 1985; Kehoe, 1989). Hence, Jean-Claude Trichet calls for a European Treasury as the European Central Bank is not fully protected from fiscal indiscipline at regional level, as there is no federal government to enforce the fiscal constraints upon the regions.

In this paper, we give evidence for this proposition by testing the interaction between the central bank, the federal government and regional budgets. To that end, we use a test developed by Canzoneri *et al.* (2001) for distinguishing active from passive fiscal regimes. This test looks into the responses of shocks to the surplus ratio on public debt, and the autocorrelation properties of the surplus. Other papers too have tested the implications of FTPL in a monetary union, but do so on a country-by-country basis (Creel and Le Bihan, 2006; Bajo-Rubio *et al.*, 2009). The main contribution of our paper is to extend the test to look at the interaction between different tiers of government. We do so by a comparison of the test results between general government and all tiers of government. An interesting example of a federal country with soft budget constraints in its fiscal system is Germany (Rodden, 2006). The federal and regional (*Länder*) governments have important fiscal powers, controlling each about half of total public spending. Fiscal homogeneity across German *Länder* requires the balancing of resources over different tiers of government and between economically weak and strong regions. This horizontal repartition of government revenues is explicitly written into the German Constitution. These transfers are further complemented with vertical grants from the federal level to further reduce economic disparities and finance specific tasks. Despite the existence of constitutional deficit rules, fiscal problems have been common. The federal government needed to bail out two *Länder* in the early nineties (Saarland and Bremen). Evidence shows also that the more transfer-dependent regions have been slower than others in adjusting fiscal positions (Rodden, 2006). We indeed find that some *Länder* are running unsustainable fiscal policies. These active

policies also spill over to the other regions: a panel VAR shows that on aggregate, regional budgets are unsustainable. In contrast, federal fiscal policy is passive and it actually offsets regional fiscal problems as we do not find evidence that fiscal series for the general government are active. The federal government shields the Bundesbank from active fiscal policies.

The paper is structured as follows. We review briefly in section 2 the theory of price determination developed by Leeper (1991), Sims (1994) and Woodford (1995), to derive the empirical test of FTPL proposed by Canzoneri *et al.* (2001), and its application to different government tiers. In section 3, we discuss the federal fiscal structure in Germany. Results follow in section 4. We conclude in section 5 with some policy implications for the EMU.

2 Testing the Fiscal Theory of the Price Level on different tiers of government

2.1 A simple test of FTPL

The flow government budget constraint describes the period-by-period dynamics of total nominal debt B_t as the accumulation due to the current primary surplus, which is the difference between government revenues T_t and government spending G_t , seigniorage revenues M_t , and interest payments on fiscal imbalances. All variables in (1) are expressed in nominal terms,

$$B_t = (T_t - G_t) + (M_{t+1} - M_t) + B_{t+1}/(1 + i_t). \quad (1)$$

We can rewrite the flow budget constraint in terms of total government liabilities $B_t + M_t$, and take into account economic growth by scaling to GDP. We then get (2)

$$\frac{M_t + B_t}{P_t Y_t} = \left[\frac{T_t - G_t}{P_t Y_t} + \left(\frac{M_{t+1}}{P_t Y_t} \right) \left(\frac{i_t}{1 + i_t} \right) \right] + \left(\frac{P_{t+1} Y_{t+1}}{(1 + i_t) P_t Y_t} \right) \left(\frac{M_{t+1} + B_{t+1}}{P_t Y_t} \right), \quad (2)$$

which says that total government liabilities have to equal the primary surplus (as a ratio to GDP) - inclusive of seigniorage revenues - plus the discounted value of next period's total liabilities. This discount factor is the ratio of real GDP growth to the real interest rate. Call w_t the ratio of total liabilities to GDP, s_t the surplus to GDP ratio, and α_t the discount factor, so as to simplify (2) to (3)

$$w_t = s_t + \alpha w_{t+1}. \quad (3)$$

By solving forward (3), we can write the present value of total liabilities w_t as

$$w_t = s_t + E_t \left[\sum_{j=t+1}^{+\infty} \left(\prod_{n=t}^{j-1} \alpha_n \right) s_j \right] \Leftrightarrow \lim_{T \rightarrow +\infty} E_t \left[\left(\prod_{n=t}^{T+t-1} \alpha_n \right) w_{t+T} \right]. \quad (4)$$

There are two alternative views on (4). A common interpretation is that (4) is the present value government budget constraint. By contrast, the FTPL does not interpret (4) as a budget constraint that is always to be satisfied, but as an equilibrium condition. Both views coincide when the government does not run unsustainable policies and eventually pays off, monetises or refinances debt. In this case, the government endogenously adjusts the sequence $\{s_t\}$ so as to satisfy (4), regardless of the values of nominal income and discount factors. If fiscal policy is sufficiently reactive to debt, the intertemporal budget constraint will be satisfied for all possible price paths. For the FTPL, this equilibrium implies that monetary policy retains the ability to control prices. Following Leeper (1991) or Woodford (1995), we call this the passive fiscal regime. However, if the government does not adjust s_t and the surplus is just an exogenous process unrelated to debt, then in order to satisfy (4), either the discount factor or the liabilities to GDP ratio have to adjust. This adjustment in w_t can only happen through a jump in nominal income as nominal liabilities $B_t + M_t$ are given in each time period. Prices move to make (4) hold, and hence the price level is determined by equating the real value of nominal government debt with the present value of primary government budget surpluses. Hence, for the FTPL, if the fiscal authority fails to take actions to ensure its intertemporal budget constraint is satisfied, it is fiscal – rather than monetary – policy that is the nominal anchor for the economy. As government solvency eventually has to be ensured in real terms, monetary policy can only give in to fiscal pressure. Eventually, the responsibility for the price level is always in the hands of the fiscal authority then. This type of equilibrium is an active fiscal regime.

An empirical verification of the plausibility of active or passive regimes runs into some identification problems. Both regimes are observationally equivalent as we always observe the equilibrium outcome under each regime. It is not sufficient to see a positive response of the primary surplus to an increase in government liabilities to recognise a passive regime in which a higher surplus today pays off debt. The same positive relationship can also be observed in an active regime, but in this case the causality runs the other way. Nominal liabilities rise with a jump in nominal income to match the expected higher value of present and future surpluses.

To overcome this identification problem, Canzoneri *et al.* (2001) propose a test that is based on (a) the response of liabilities to innovations in the surplus, and (b) the serial correlation of the surplus.⁶ They distinguish between both regimes on the grounds that a negative serial

⁶For other attempts to test the FTPL, see Cochrane (1998), Hetzel and Leach (2001), Woodford (2001) or

correlation of the surplus makes the active regime theoretically implausible. The argument runs as follows. A positive innovation in the surplus that moreover raises future surpluses implies that public debt is being paid off as government liabilities continue falling. This is a passive regime. An active regime would be obvious in two different cases. The first case happens when future liabilities rise after an innovation to the surplus and the shock to the surplus is positively correlated with future surpluses. This implies the surplus is set independently of the position of total liabilities, and nominal income jumps to ensure the equilibrium is satisfied. The second case occurs when the rise in the surplus does pay off debt, but due to the revaluation effect of nominal income in an active regime, liabilities increase. The net effect on the surplus s_t is therefore nil, and s_t does not serially correlate with future surpluses then. Nonetheless, there is also a third active regime that gives the same prediction for the fall in liabilities as under the passive regime. After a positive shock to the surplus, nominal income and/or the expected future fiscal surpluses must move to achieve fiscal balance in the active regime. Future liabilities would fall in an active regime if the shock to the surplus is negatively correlated with future surpluses. Given that we usually observe positive serial correlation in surpluses, it is only possible to make this occur if there were to be a strong negative correlation of the surplus at longer horizons. Moreover, these deficits would need to be so large to make the present value of surpluses fall. This implies that deficits are so large, persistent or heavily discounted that they can offset the initial increase in the surplus, making policy active.⁷

Test to distinguish these cases can be run by looking at (a) the impulse responses of a VAR including the surplus and total liabilities, and (b) the autocorrelation function of the surplus. This can be done with a VAR model that includes the surplus, total liabilities and also controls for the discount factor.⁸ In order to allow for the jump in nominal income in the active regime, the surplus and total liabilities are expressed as a ratio to GDP. The identification assumption employed is a simple cholesky ordering. Both orderings of surplus and debt are equally likely. If we order the surplus first, the innovation to the surplus is indeed an exogenous shock. This makes more sense in an active regime as it allows for a contemporaneous response in the liabilities ratio: nominal GDP (or discount factors) jumps to ensure that outstanding liabilities equal the

Sala (2004).

⁷Canzoneri *et al.* (2001) go on arguing that this negative correlation makes the active regime implausible. If the government decides to raise the surplus today, it would deliberately change its policy into a deficit at some time in the future. But given that the surplus in an active regime is determined by an exogenous process, this change in policy should happen for some exogenous reason that is not related to the level of public debt. Cochrane (1998) makes some suggestions on models explaining this behaviour of the government.

⁸The stochastic discount factors $\{\alpha_t\}$ may move as well to make the 4 hold in equilibrium. A negative correlation of surpluses with future discount factors would make the passive regime more plausible. In our specification of the VAR, we simply control for exogenous discount factors, as these are similar for all regional governments in any case. Robustness checks with endogenous $\{\alpha_t\}$ confirm the main results in any case.

expected present value of surpluses. By contrast, if we order liabilities first, nominal GDP might be determined exogenously. We can identify a shock to the surplus that does not have a contemporaneous impact on liabilities. This ordering would favour a passive regime. A rise or a non-significant response of liabilities to a shock in the surplus indicates active fiscal policy. A fall in liabilities is only consistent with an active regime in case the surplus displays negative serial correlation.

2.2 A test for interaction between central bank, federal government and regions

Other papers have used the test developed by Canzoneri *et al.* (2001) to test fiscal regimes on general government data.⁹ We extend the test to different government tiers. A comparison of the test results between general government and all tiers of government allows us to infer on the interaction between the regional governments, the federal government and the central bank. We know that an active policy of a single regional government is sufficient to make fiscal policy active for all governments of the same tier. We thus need to test first whether each regional government runs an active or passive fiscal policy. Some papers have inferred the consequences for the European Central Bank from the passive or active policy response in the EMU on a country-by-country basis (Creel and Le Bihan, 2006; Bajo-Rubio *et al.*, 2009), but finish testing at this stage.

We take the test a few steps further. First, if we find that in at least one region fiscal policy is active, then the empirical prediction is that regional fiscal policies are in a passive regime on aggregate (Sims, 1999; Bergin, 2000). We verify this proposition by testing the surplus-debt relation in a panel VAR of all regions together. Second, the federal government may internalise the spillover effect of active policies on the price level. If there is indeed free riding among regional governments, the federal government may compensate for this with a passive policy. It is not sufficient that the federal government follows a passive policy. It should be passive enough so that the consolidated general government budget series is in a passive regime. We therefore run the FTPL test first on federal government data, and consequently on general government data.

Testing the FTPL on different government levels involves some issues on the data to use. Strictly speaking, government liabilities include government debt as well as the money base measured at the beginning of the fiscal year. Both series are then divided by nominal GDP of the current year. A division of the money base on a regional basis is not possible since its division

⁹Brazil (Tanner and Ramos, 2003), UK (Janssen *et al.*, 2002), or Germany and Spain (Thams, 2007).

is not considered relevant in a monetary union. Moreover, in many countries, as in Germany, the constitution prohibits direct central bank financing of regional budgets. As a consequence, we choose to exclude the money base also from the federal and general government data. A second issue in a monetary union are the discount factors to use. We may approximate these with the yield on one year government bonds. However, regional interest rates on government bonds are available over a brief period of time only and the spreads between regional interest rates are negligible (Fitch, 2005). We choose the federation’s interest rate - a short-term bond yield - but since this is an exogenous variable for the regions, we also take it as an exogenous control variable in the surplus-debt relation.¹⁰

3 Fiscal federalism in Germany

Germany is an interesting example to test fiscal regimes on different government levels. Germany is a monetary union with a central bank that has been renowned for its strong adherence to low inflation. The memory of fiscal trouble and the hyperinflation of the twenties imposed upon the monetary policy of the Bundesbank the strict task of price stability. Both the federal and the 16 regional governments (Länder) have important fiscal powers. German regional policies are as important as the federal budget in determining the overall budget balance. Each has under control about half of total public spending. However, the Länder have little control over tax income, and most revenues come from shared taxes and grants. There are vertical fiscal transfers between the federal government and the Länder, but also horizontal ones among the Länder. The reason is that the fiscal system stresses fiscal homogeneity that requires the balancing of resources over different tiers of government and between economically weak and strong regions. This horizontal repartition of government revenues (*‘Länderfinanzausgleich’*) is explicitly written into the German Constitution. These transfers are further complemented with vertical grants from the federal level to further reduce economic disparities and finance specific tasks.¹¹

The federal fiscal system in Germany is susceptible to soft budget constraints and fiscal problems have been rather common (Rodden, 2006). Deficits are only allowed to finance investment, yet despite this constitutionally anchored restriction, this golden rule has been repeatedly breached. The federal government even came to the rescue of two Länder in the early nineties

¹⁰Robustness checks with endogenous $\{\alpha_t\}$ confirm our main results.

¹¹The equalization scheme first pools 25 percent of VAT from all Länder and reallocates this quantity to the Länder with the lowest tax revenues (in terms of per capita tax income) so that they reach 95 percent of their financial capacity. The federal government supplements this with grants so that all Länder achieve at least 99.5 percent of their financial capacity (Seitz, 1999).

(Saarland and Bremen) with a bail out after the Constitutional Court ruled that the federation is responsible for maintaining equal living conditions on the entire territory (Seitz, 1999).

We can illustrate this deficit and debt bias with a look at the data. Data on German fiscal policies come from different sources. General government series are from the OECD.¹² Data for the federal government are available from the Public Finances Series of the Statistisches Bundesamt (Fachserie 14, Reihe 3.1). Regional budget data were provided by the Ministry of Finance. Fiscal data are consolidated across Länder and towns. The series include the horizontal transfers between Länder, and the vertical transfers from the federal government. Land GDP comes from the revised data from the Volkswirtschaftliche Gesamtrechnungen der Länder. Data cover the sample 1970-2005, and are annual. We finish the sample in 2005 as a major reform of the German fiscal system took place in that year.

The aggregate deficit of the Länder has been rather constant since the seventies at about 1% (figure 1). Most of the variation in the balance of the general government is due to changes in the fiscal stance of the federal government. These reflect the strong spending boost of the Brandt government around 1976, German Reunification in 1991 and the consolidation since entry in EMU in 1999. The federal government and the Länder contribute in almost equal proportions of 30 per cent to the overall debt position. German Reunification has been nearly completely financed by federal debt issues. In recent years, the federal government contributes about 10 per cent more than the regional tier to overall debt.

We have displayed the deficit ratios for the German Länder in figure 2. The situation of the three city-states (Berlin, Bremen and Hamburg) and the smallest German region (Saarland) are illustrative of the evolution of public finances of all Länder. The first characteristic concerns the bailed out states. The peak in deficits in Saarland and Bremen in 1992 shows the enormous fiscal havoc in both states that eventually led to the federal bail out in 1993. The continuous financial support to both regions has only in part led to a reduction in deficits, and deficits have continued to grow in recent years. A second striking feature of figure 2 is the dramatic fall in Berlin's budget surplus. This is part of a phenomenon observed in all former Eastern-German Länder. Deficits quickly shot up directly after Reunification as the new states faced very large spending responsibilities at a moment that economic transition caused revenues to fall.¹³ Until 1994, a large gap between both sides of the budget persisted. At that point, these states entered the Finanzausgleich system, and were entitled to extra revenues. The consequent increase in revenues brought state budgets closer to balance. In contrast to Berlin, most former Eastern German states have been able to contain deficits to a level that is only slightly higher than in

¹²We cleaned the German data for the sale of the UMTS licenses, which had an unusually large budget impact in 2000.

¹³The only exception here is Sachsen.

the old Länder. A final feature of the fiscal behaviour of lower tiers is the build-up of deficits during the eighties in old Länder. After Reunification, these Länder have kept deficits under control, but this has become more difficult in recent years. Deficits have started to grow again in all Länder. As a consequence, the steady position of debt in a range of about 10 to 25 per cent across Western German Länder has not been kept (figure 3). The debt evolution highlights the same differences in deficits in the Eastern and Western German Länder. Public debt levels in the Eastern Länder seem to converge to the German average of about 35%. Berlin and Bremen, and to a lesser extent Saarland, are accumulating ever more debt.¹⁴

4 Results

4.1 The spillover of regional fiscal policies

Let us first look at the behaviour of the fiscal policies of the Länder. We are interested in the sign of the debt response after an innovation in the surplus, which is what we report. For parsimony, we present in table format the accumulated responses at a horizon of two, five and eight years and their significance (here at 95% asymptotic error bounds). We present in the main part the results for a VAR in which liabilities are ordered first.¹⁵ Table 1 shows that in most Länder the accumulated response to a surplus shock is negative. This response is also significant. Moreover, the autocorrelation function in table 2 shows that surpluses are positively correlated. This would indicate that most regions are running a passive policy. There are a few exceptions, in which fiscal policy is active. First, a shock to the surplus in Bremen is followed by rises in liabilities. Given that the surplus is positively serially correlated, fiscal policy must be active. Second, there are two Länder, Hessen and Hamburg, where the response of liabilities is not significant after a surplus shock. With positive serial correlation for at least three years after the shock, fiscal policy can be classified as active. Finally, the surplus to GDP ratio in Sachsen and Thüringen displays negative serial correlation at short horizons. In Sachsen, the serial correlation turns negative after one year already. At longer horizons, this negative correlation becomes even larger, but is hardly significant. In Thüringen by contrast, the correlation becomes negative after two years and is large and significant. At longer horizons, it turns positive again. For both Länder, this would again indicate an active regime.

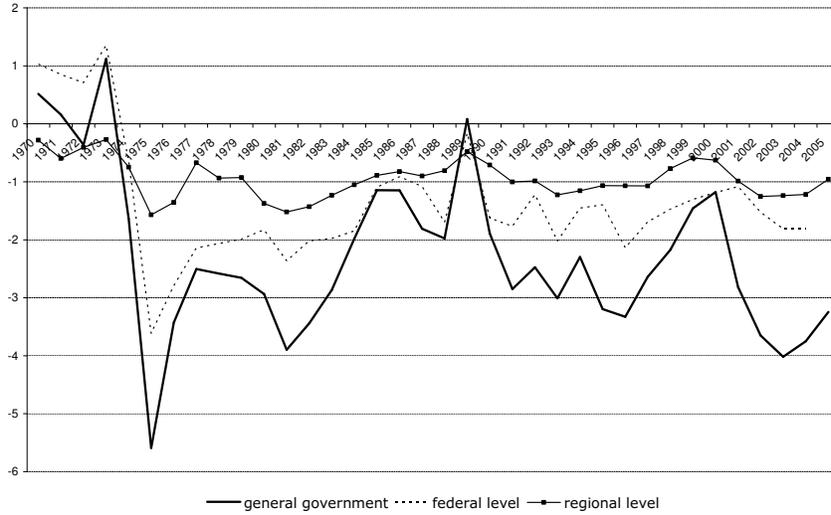
Can we associate these active regimes with a particular fiscal policy? The results should

¹⁴Berlin applied for federal government intervention in October 2006, but its request was repealed by the Federal Constitutional Court.

¹⁵Since German Reunification has implied a major overhaul, we control for this shift with an impulse dummy and a time trend as of 1991. The BIC test indicates that the optimal length of the VAR is two years.

Figure 1: Germany, 1970-2005: fiscal series for government tiers.

(a) surplus to GDP ratio



(b) debt to GDP ratio

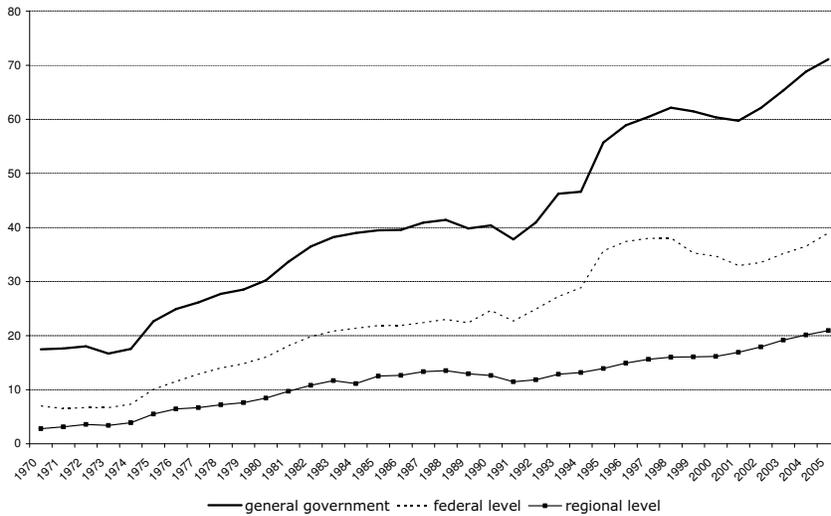


Figure 2: German Länder: state surplus ratio (% of state GDP).

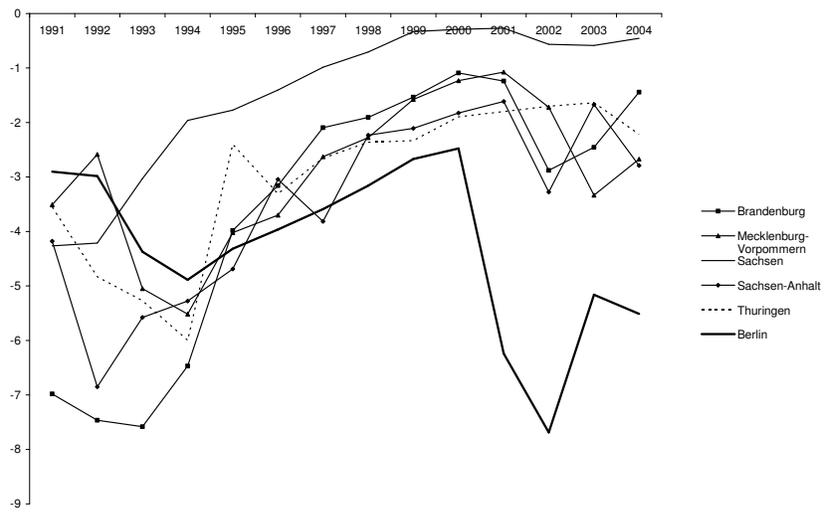
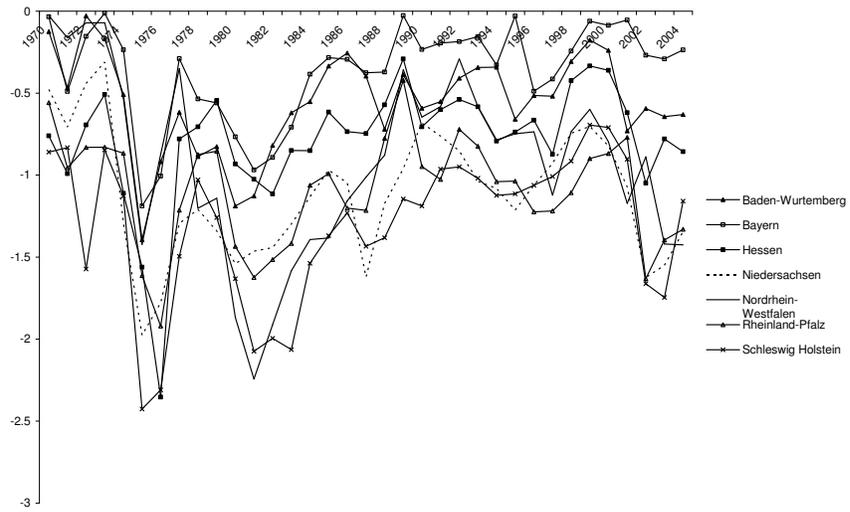
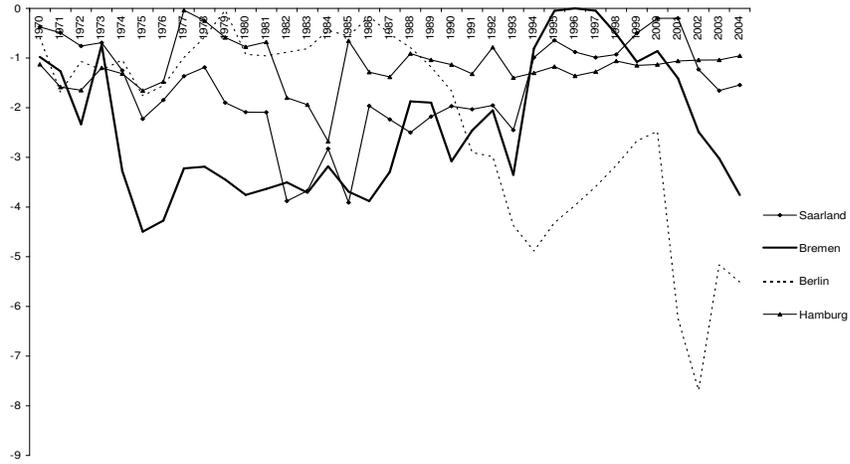


Figure 3: State debt ratio for German Länder (% of state GDP).

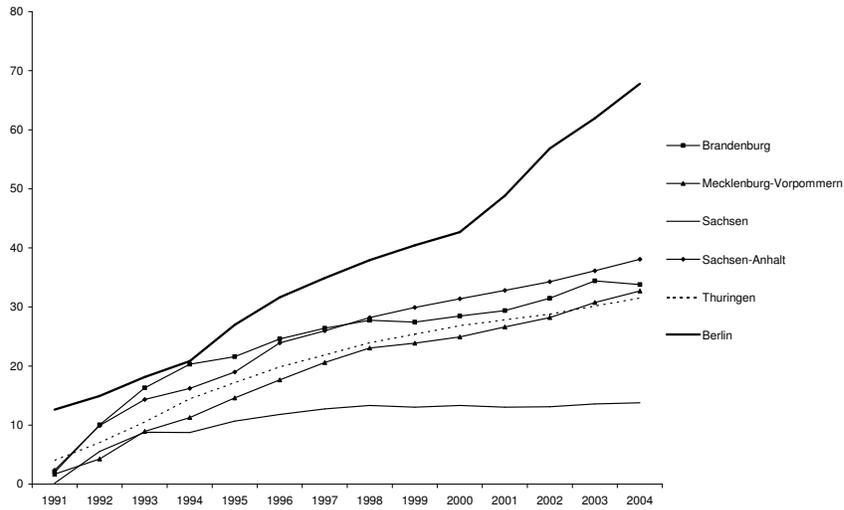
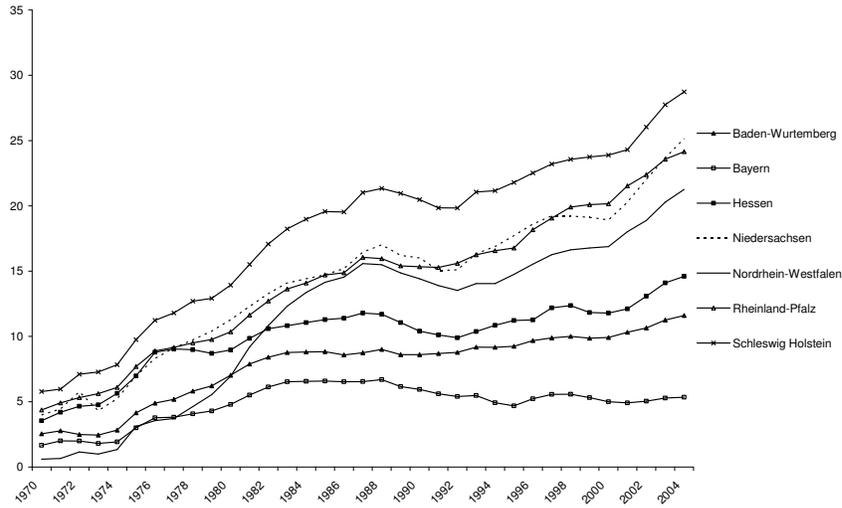
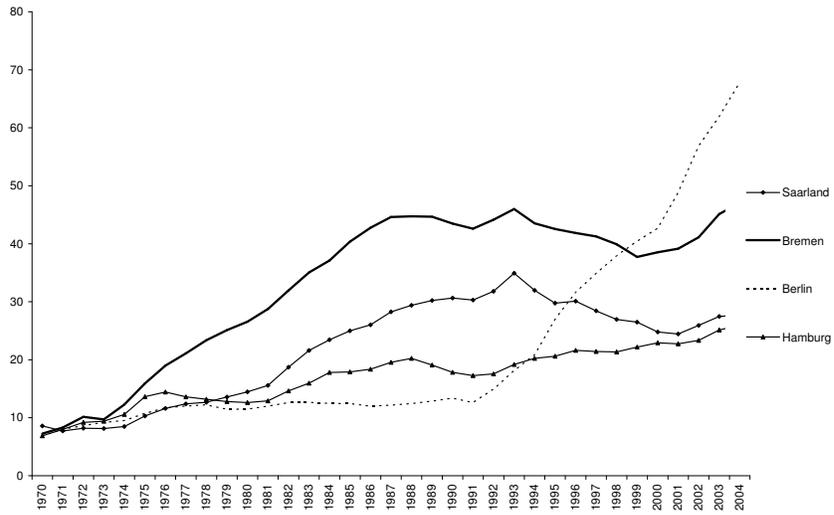


Table 1: Accumulated IRFs of the liabilities/GDP ratio to a shock in the surplus ratio.^{a)}

years after the shock	<i>2y</i>	<i>5y</i>	<i>8y</i>
Baden-Württemberg	-0.0015*	-0.0050*	-0.0089*
Bayern	-0.0013*	-0.0037*	-0.0059*
Hessen	-0.0002*	0.0035	0.0092
Niedersachsen	-0.0120*	-0.0345*	-0.0565*
Nordrhein Westfalen	-0.0034*	-0.0136*	-0.0267*
Rheinland Pfalz	-0.0037*	-0.0100*	-0.0163*
Saarland	-0.0065*	-0.0258*	-0.0495*
Schleswig Holstein	-0.0053*	-0.0178*	-0.0315*
Berlin	-0.0176*	-0.0648*	-0.1270*
Bremen	-0.0030	-0.0199	-0.0442
Hamburg	-0.0005	-0.0024	-0.0048
Brandenburg ^{b)}	-0.0084*	-0.0181*	-0.0249*
Mecklenburg Vorpommern ^{b)}	-0.0021*	-0.0104*	-0.0192*
Sachsen ^{b)}	-0.0078*	-0.0188*	-0.0302*
Sachsen-Anhalt ^{b)}	-0.0117*	-0.0438*	-0.0873*
Thüringen ^{b)}	-0.0014*	-0.0051*	-0.0092*
panel VAR ^{c)}	0.0143	-0.0068	-0.0445
regional government	0.0067	0.0208	0.0352
central government	-0.0064	-0.0248	-0.0457
general government	-0.0182	-0.0567	-0.0975

Notes: a) cholesky ordering, surplus ordered first, VAR with 2 lags, impulse response for a shock with 1 standard deviation, a * indicates significance at 95% asymptotic bounds; b) data are for the period 1991-2005; c) panel VAR includes only the old Länder.

probably not come as a surprise. Bremen was one of the two regions to be bailed out by the federal government in 1992 after debt reached nearly 50% of regional GDP. Hessen and Hamburg have been running very stable fiscal policies instead. Actually, both are among the richest Germany regions in per capita income. Both Länder are important net contributors to the Finanzausgleich. The surpluses they create are skimmed off to regions with fiscal trouble, which causes a political stir from these net contributors.¹⁶

What does the active policy imply for the interaction between different regional governments. An active policy in a single region suffices for making the regime active for all regions. We confirm this result on two accounts. First, we run a panel VAR with the same specification as the basic model. The initial response to a shock in the surplus is a rise in liabilities. At longer horizons, liabilities start to fall but this fall is never significant (table 1). Even if we cannot compute the serial correlation of this 'panel' surplus, regional fiscal policy can clearly be classified as active. Second, we simply sum the regional budget data. The previous results suggested horizontal transfers might offset active policies. By aggregating the surplus series, we net out the effect of horizontal transfers between regions. The finding of an active regime for this hypothetical single regional government should be stronger then. Indeed, the impulse response after a surplus shock shows that liabilities continue to rise until ten years after the shock (figure 4). The impulse response functions are computed for a one standard deviation shock to the surplus ratio, and are plotted with 95% asymptotic error bounds. As the serial correlation of this hypothetical surplus is positive, regional fiscal policy is certainly in an active regime. Both results confirm the spillover effect of an active regime to all governments in the monetary union.

As the German fiscal system has undergone quite some changes since 1970, we check if the regimes may vary over time. The Reunification of Germany is of course a major break. The federal government initially bore the brunt of the burden and financed the transition with public debt. We therefore analyse two different sample periods: 1970-1990 for the old Länder; 1991-2005 for both new and old Länder. Although the former Eastern German regions have been incorporated in the Finanzausgleich only in 1995, the system was already adapted in anticipation of this event in 1991.

The basic results remain on both subsamples. We find that splitting the sample period in 1990 does not lead to different results (table 3). The German fiscal system is characterised by active regimes both before and after the Reunification. Before 1990, only a VAR on aggregate regional budget indicates an active regime (whereas the panel VAR does not). After 1990, a few regions follow active policies, and the overall regime is active. The reform of the fiscal system

¹⁶This result tells us that there are also significant transfers between regions that correct fiscal imbalances.

Table 2: Autocorrelation function of the surplus ratio.

lag	ACF	Q-stat	prob	ACF	Q-stat	prob	ACF	Q-stat	prob
	Baden-Württemberg			Bayern			Hessen		
1	0.54	11.08	0.00	0.53	10.77	0.00	0.81	11.30	0.00
2	0.24	13.33	0.00	0.20	12.31	0.00	0.53	16.57	0.00
3	0.06	13.48	0.00	0.14	13.11	0.00	0.19	17.27	0.00
4	0.05	13.57	0.01	0.21	14.99	0.01	-0.09	17.47	0.00
5	-0.01	13.58	0.02	0.19	16.49	0.01	-0.27	19.23	0.00
	Saarland			Schleswig Holstein			Berlin		
1	0.71	19.28	0.00	0.47	8.23	0.00	0.74	20.63	0.00
2	0.48	28.15	0.00	-0.08	8.47	0.01	0.57	33.34	0.00
3	0.35	32.96	0.00	-0.15	9.33	0.03	0.47	42.21	0.00
4	0.16	34.02	0.00	0.04	9.39	0.05	0.27	45.18	0.00
5	0.04	34.08	0.00	0.09	9.75	0.08	0.18	46.50	0.00
	Mecklenburg			Sachsen			Sachsen-Anhalt		
1	0.82	25.77	0.00	0.82	25.77	0.00	0.73	20.05	0.00
2	0.52	36.40	0.00	0.52	36.40	0.00	0.52	30.49	0.00
3	0.38	42.37	0.00	0.38	42.37	0.00	0.45	38.78	0.00
4	0.31	46.40	0.00	0.31	46.4	0.00	0.30	42.48	0.00
5	-	-	-	-	-	-	0.16	43.56	0.00
	Niedersachsen			Nordrhein Westfalen			Rheinland-Pfalz		
1	0.45	7.72	0.01	0.68	7.95	0.01	0.64	15.44	0.00
2	0.09	8.03	0.02	0.39	10.72	0.01	0.13	16.13	0.00
3	-0.16	9.10	0.03	0.15	11.18	0.01	-0.10	16.55	0.00
4	0.05	9.21	0.06	-0.18	11.87	0.02	-0.10	17	0.00
5	0.17	10.42	0.06	-0.26	13.54	0.02	-0.04	17.08	0.00
	Bremen			Hamburg			Brandenburg		
1	0.77	10.12	0.00	0.67	7.79	0.01	0.58	12.58	0.00
2	0.43	13.56	0.00	0.52	12.88	0.00	0.13	13.25	0.00
3	0.16	14.11	0.00	0.18	13.51	0.00	0.09	13.61	0.00
4	-0.01	14.11	0.01	-0.11	13.78	0.01	0.12	14.22	0.01
5	-0.14	14.62	0.01	-0.18	14.61	0.01	0.12	14.87	0.01
	Thüringen			federal government			general government		
1	0.33	4.13	0.04	0.54	11.10	0.00	0.47	8.73	0.00
2	0.07	4.33	0.12	0.22	13.01	0.00	0.04	8.79	0.01
3	-0.10	4.7	0.20	0.09	13.32	0.00	0.01	8.80	0.03
4	-0.15	5.59	0.23	-0.18	14.59	0.01	-0.15	9.80	0.04
5	-0.45	14.4	0.01	-0.21	16.48	0.01	-0.20	11.50	0.04

Notes: Q-stat and prob indicate the test statistic and p-value for a significant autocorrelation coefficient.

Table 3: Accumulated IRFs of the liabilities/GDP ratio to a shock in the surplus ratio.

years after the shock	1970-1990			1991-2005		
	2y	5y	8y	2y	5y	8y
Baden-Württemberg	-0.0017*	-0.0063*	-0.0109*	-0.0020*	-0.0048*	-0.0079*
Bayern	-0.0033*	-0.0092*	-0.0143*	0.0003	0.001	0.0018
<i>Hessen</i>	0.0014	0.0088	0.0179	-0.0020*	-0.0025*	-0.0033*
Niedersachsen	-0.0157*	-0.0455*	-0.0742*	-0.0059*	-0.0111*	-0.0147*
Nordrhein Westfalen	-0.0090*	-0.0321*	-0.0572*	0.0009	0.002	0.0035
Rheinland Pfalz	-0.0067*	-0.0175*	-0.0269*	-0.0004*	-0.0006*	-0.0008*
Saarland	-0.0050*	-0.0225*	-0.0465*	-0.0028*	0.0074	0.0126
Schleswig Holstein	-0.0078*	-0.0261*	-0.0454*	-0.0037*	0.0012	-0.0030*
Berlin	-0.0058*	-0.0183*	-0.0316*	-0.0165*	-0.0455*	-0.0827*
<i>Bremen</i>	-0.0039*	-0.0384*	-0.0982*	-0.0005*	-0.0103*	-0.0238*
<i>Hamburg</i>	-0.0019*	-0.0073*	-0.0129*	0.0077	0.0268	0.0510
Brandenburg b)	—	—	—	-0.0084*	-0.0181*	-0.0249*
Mecklenburg Vorpommern b)	—	—	—	-0.0021*	-0.0104*	-0.0192*
<i>Sachsen</i> b)	—	—	—	-0.0078*	-0.0188*	-0.0302*
Sachsen Anhalt b)	—	—	—	-0.0117*	-0.0438*	-0.0873*
<i>Thüringen</i> b)	—	—	—	-0.0014*	-0.0051*	-0.0092*
<i>panel VAR</i>						
old and new c)	—	—	—	0.0055	0.0121	0.0155
old	-0.0035*	-0.0070*	-0.0116*	0.0074	0.0223	0.0455
new	—	—	—	-0.0191*	-0.0345*	-0.0469*
regional government	0.0093	0.0261	0.0421	0.004	0.0129	0.0226
central government	-0.0039*	-0.0113*	-0.0189*	-0.0179*	-0.0599*	-0.1066*
general government	-0.0158*	-0.0485*	-0.0827*	-0.0317*	-0.1009*	-0.1752*

Notes: a) cholesky ordering, liabilities ordered first, VAR with 2 lags, impulse response for a shock with 1 standard deviation, a * indicates significance at 95% asymptotic bounds; b) data are for the period 1991-2005; c) panel VAR includes only the old Länder.

has affected the amount of transfers, but has not led to an overhaul of the interactions between the federal government, the central bank and the regions.

4.2 The federal budget offsets active regional policies

Does fiscal profligacy at the regional level affect the decisions of the federal government? It can only shield the Bundesbank from the fiscal pressure of the Länder if it manages to balance the active regime with a budget that responds to the level of outstanding liabilities. For this, the federal government should run a passive policy. This policy is also what we find in the VAR. Future liabilities fall after a positive innovation to the surplus (table 1, figure 5). The positive serial correlation makes us discard the possibility of an active regime.

This budget policy of the federal government may not be passive enough to offset the effect of the active policies of the Länder. From the previous results, it is clear that the federal government has not provided (vertical) transfers to all regions to offset fiscal indiscipline. It can still do so by compensating within its own budget. We can analyse this by looking at consolidated data of the general government. The impulse response function shows that liabilities continue to fall after a positive shock to the surplus (table 1, figure 6). Moreover, with a positive auto-correlation in the general government surplus, fiscal policy can only be passive (table 2). Hence, fiscal policy in Germany is passive. This confirms similar findings by Thams (2007) on general government data, but we moreover show that this passive regime is the combination of active regional policies and a federal passive budget. The latter stems the spillover effect of the former on aggregate economic variables.

The result is also robust over different sample periods. Despite the burden of Reunification on the federal budget, federal policy follows a passive regime both before and after 1990 (Table 3). Over both periods, this passive policy is offsetting the active regional policy.

We find that some regions pursue passive policies, while others do not. The finding of a strong active regime for the aggregate regional budget suggests that horizontal transfers play an important role in mitigating unsustainable policies too. The *Finanzausgleich* compensates between regions. But the fiscal situation of the regions is still deficitary on aggregate. Vertical federal transfers offset the active regimes at regional level. A reverse transfer must then logically occur from at least some regions in order to make the passive policy of the federal government possible. As the federal government taxes all citizens in all regions, it must tax the regional resources relatively more to pursue its passive policy. Only in this way, it can compensate within its own budget sufficiently so as to make fiscal policy passive on aggregate. This has implications for the role of the federal government over time. The financing of regional deficits strengthens its bargaining position, and the implicit tax transfers eventually allow the federal government to finance more tasks than regions do. The increasing role of the German federal government in (co)financing public spending is a phenomenon we indeed observe (Seitz, 1999).

5 Conclusion

In a federation, regional governments may pursue unsustainable fiscal policies and free ride on the efforts of other fiscal authorities, the federal government or the common central bank to come to its rescue. Such active policies would spur inflation across the monetary union as monetary policy loses control over prices (Leeper, 1991; Bergin, 2000). Commitment by either the central bank or the federal government not to bail out are sufficient to maintain fiscal discipline. To

Figure 4: IRF of liabilities: response to 1 s.d. shock to surplus, regional government.

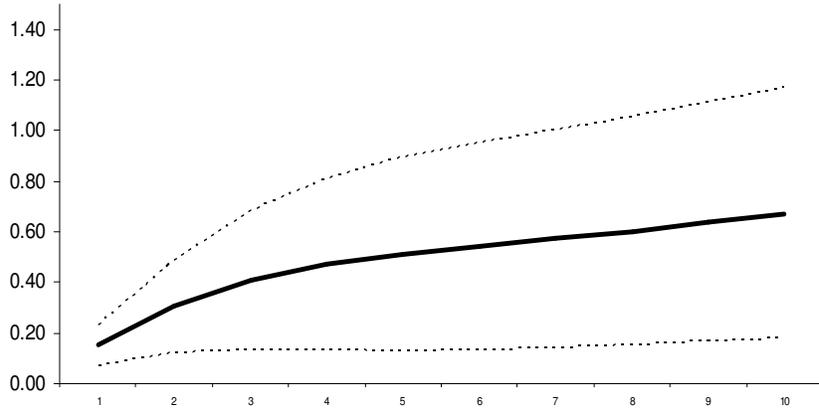


Figure 5: IRF of liabilities: response to 1 s.d. shock to surplus, federal government.

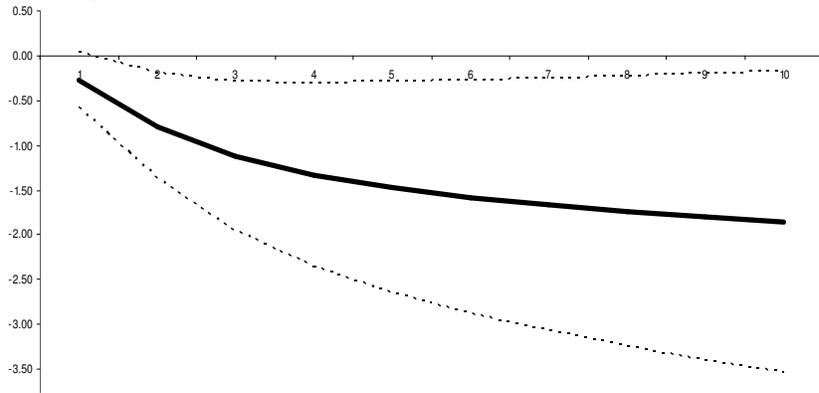
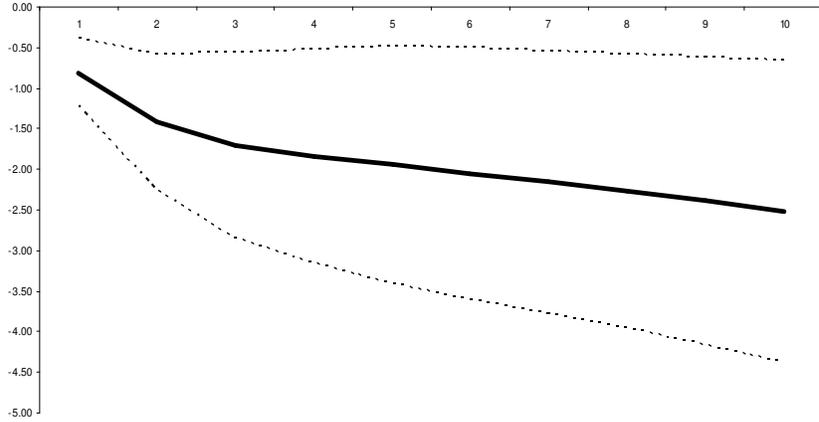


Figure 6: IRF of liabilities: response to 1 s.d. shock to surplus, general government.



oblige regional governments pursue passive fiscal policies requires credible rules. Depending on its political situation, the federal government can enforce deficit or debt rules, also because it may provide the necessary fiscal means to pay off debt. *Ex ante*, tax sharing agreements and joint spending schemes provide implicit additional financing of regional budgets. *Ex post*, in extreme cases, this may even entail an explicit bail out. This fiscal backstop makes monetary commitment more credible. At the same time, credibility of the central bank reinforces the position of the federal government.

We use a test developed by Canzoneri *et al.* (2001) for distinguishing passive from active fiscal regimes to give evidence on the interaction between different tiers of government by using data on the federal and regional budgets in Germany. The main finding is that the spillover effects from the regions that are running unsustainable fiscal policies are indeed countered by the federal government. Federal fiscal policy has provided a mechanism to avoid that fiscal policies on aggregate are active. In this way, the federal government has protected the independence of the Bundesbank.

There are other examples of federations in which regional fiscal policies create macroeconomic havoc, with implications for monetary policy. In some federations, a strong centre can impose strict rules on weak regional governments. In others, a weak federal government could instead be in the political hands of the regions, and be fiscally too weak to stand between the regions and the central bank. The relationships between the federal and regional governments depend on historical circumstances (Rodden *et al.*, 2003). In Argentina, for example, the fiscal power balance is tilted towards the regions, and the federal government has little control over the general budget (Tommasi *et al.*, 2001). This structure explains the inability of the Argentinean government to rein in debt and follow a fiscal rule that would bring down primary deficits sufficiently to stave off the currency crisis of 2001 (Daniel, 2010). In November 2001, the Finance Minister Cavallo had to give in eventually to the pressure from loose budgets run in previous years by provincial governors. As a consequence, the central bank could not honor its commitment to convert pesos to dollars anymore, and the currency board, which tied the peso to the dollar at parity had to be abandoned. All internal debt was pesoized but this was not enough to restructure public debt and eventually Argentina defaulted on 75 per cent of its dollar denominated outstanding debt (IMF, 2005). These events pushed inflation up to 60% in early 2002. According to Uribe (2006) and Daniel (2010), this episode of hyperinflation was the jump in prices required to equate the value of debt to the present value of surpluses.

In the EMU, the European Central Bank had arguably been shielded from this type of fiscal pressure. With no single fiscal power, the Stability and Growth Pact, and the no-bail out clause of the Treaty, fiscal responsibilities lay with national fiscal policies (Beetsma and

Bovenberg, 1998). However, as the Financial Crisis turned into a sovereign debt crisis in the Eurozone, this set-up has not proven stable enough, as both fiscal and monetary bail outs have been necessary (Daniel and Shiamptianis, 2012). A single European Treasury, as called for by Jean-Claude Trichet, would shield the European Central Bank from undue pressure by national fiscal policies, and render more credible its commitment to price stability, as it would enable tools to more forcefully control national fiscal policy. Worries that a single European Treasury could become a challenger to the European Central Bank are founded, but this depends on the kind of authority which it may be given as argued in Belke and Gros (2009). A European Treasury that controls national budgets and enforces fiscal rules need not employ a large budget itself. The choice to set up a European Treasury is a political one, of course.

References

- Bajo-Rubio O., Diaz-Roldan C. and Esteve V. (2009). Deficit sustainability and inflation in EMU: an analysis from the FTPL. *European Journal of Political Economy*, 25, 525-539.
- Barro R., and Gordon D. (1983). A Positive Theory of Monetary Policy in a Natural- Rate Model. *Journal of Political Economy*, 91(3), 589– 610.
- Beetsma R., and Bovenberg L. (1998). Monetary Union without Fiscal Coordination May Discipline Policymakers. *Journal of International Economics*, 45(2), 239–58.
- Beetsma R., and Bovenberg L. (2003). Strategic debt accumulation in a heterogeneous monetary union. *European Journal of Political Economy*, 19(1), 1–15.
- Beetsma R., and Uhlig H. (1999). An analysis of the SGP. *Economic Journal*, 109, 546-571.
- Belke A., and Gros D. (2009). Is a unified macroeconomic policy necessarily better for a common currency area?, *European Journal of Political Economy*, 25(1), 98-101.
- Bergin P. (2000). Fiscal solvency and price level determination in a monetary union. *Journal of Monetary Economics*, 45, 37-53.
- Bergsten J., and Kierkegaard J. (2011). The coming resolution of the European crisis. VoxEU.
- Canzoneri M., Cumby R. and Diba B. (2001). Is the Price Level determined by the Needs of Fiscal Solvency? *American Economic Review*, 91(5), 1221-1238.
- Chari V., and Kehoe P. (2004). On the desirability of fiscal constraints in a monetary union. NBER working paper 10232.
- Cochrane J. (1998). A frictionless view of US inflation. In: Bernanke B. and Rotemberg J. (eds.), *NBER Macroeconomics Annual*, 13, Cambridge (MA). MIT Press, 323-384.
- Creel J., and Le Bihan H. (2006). Using structural balance data to test the FTPL: some international evidence. *Journal of Macroeconomics*, 28, 338-360.
- Daniel B. (2001). The FTPL in an open economy. *Journal of Monetary Economics*, 48, 293-308.
- Daniel B. (2010). Exchange rate crises and fiscal solvency. *Journal of Money, Credit and Banking*, 42(6), 1109-1135.
- Daniel B., and Chiamptianis C. (2012). Fiscal risk in a monetary union. *European Economic Review*, 56, 1289-1309.
- Dixit A. (2001). Games of monetary and fiscal interactions in the EMU. *European Economic Review*, 45(4-6), 589-613.
- Dixit A., and Lambertini L. (2003). Interactions of Commitment and Discretion in Monetary and Fiscal Policies. *American Economic Review*, 93(5), 1522-1542.
- Dupor B. (2000). Exchange Rates and the FTPL. *Journal of Monetary Economics*, 45(3),

613-30.

Fitch (2005). German Länder 'AAA' ratings: questions and answers. Special Report.

Hetzel R., and Leach R. (2001). The Treasury-Fed Accord: a new narrative account. Federal Reserve Bank of Richmond, *Economic Quarterly*, 87(1), 33-55.

IMF (2005). Country Report no. 05/236.

Janssen N., Nolan C. and Thomas R. (2002). Money, debt and prices in the UK 1705-1996. *Economica*, 69, 461-479.

Jensen H. (1996). The advantage of international fiscal cooperation under alternative monetary regimes. *European Journal of Political Economy*, 12(3), 485-504.

Kehoe P. (1989). Policy Cooperation among Benevolent Governments May Be Undesirable. *Review of Economic Studies*, 56(2), 289-96.

Leeper E. (1991). Equilibria under 'active' and 'passive' monetary and fiscal policies. *Journal of Monetary Economics*, 27, 129-147.

Rodden J., Eskeland G. and Litvack J. (2003). *Fiscal Decentralization and the Challenge of hard Budget Constraints*. Cambridge, Mass.: MIT Press.

Rodden J. (2006). Fiscal Discipline in Federations: Germany and the EMU, in: Wierds P., Deroose S., Flores E. and Turrini A. (eds.), *Fiscal Policy Surveillance in Europe*, Palgrave MacMillan.

Rogoff K. (1985). Can International Monetary Policy Cooperation Be Counterproductive?, *Journal of International Economics*, 18(3- 4), 199-217.

Sala L. (2004). The FTPL: identifying restrictions and empirical evidence. IGIER working paper 257.

Seitz H. (1999). Subnational government bailouts in Germany. Zentrum für Europäische Integrationsforschung, working paper B-20.

Sims C. (1994). A simple model for study of the determination of the price level and the interaction of monetary and fiscal policy. *Economic Theory*, 4(3), 381-399.

Sims C. (1999). The precarious fiscal foundations of EMU. *De Economist*, 147(4), 415-436.

Svensson L. (1997). Optimal Inflation Targets, 'Conservative' Central Banks, and Linear Inflation Contracts. *American Economic Review*, 87(1), 98 - 114.

Tanner E., and Ramos A. (2003). Fiscal sustainability and monetary versus fiscal dominance: evidence from Brazil. *Applied Economics*, 35(7), 859 - 873.

Tommasi M., Saiegh S. and Sanguinetti P. (2001). Fiscal federalism in Argentina: policies, politics and institutional reform, *Economia*, 1(2), 157-211.

Ter-Minassian T. (2007). Fiscal Rules for Subnational Governments: Can They Promote Fiscal Discipline?, *OECD Journal of Budgeting*, 6(3), 1-11.

Thams A. (2007). The relevance of the FTPL revisited. MPRA Paper 1645, University Library of Munich, Germany.

Uribe, M. (2006). A Fiscal Theory of Sovereign Risk. *Journal of Monetary Economics*, 53, 1857–75.

Woodford M. (1994). Monetary Policy and Price Level Determinacy in a Cash-in-Advance Economy. *Economic Theory*, 4(3), 345-80.

Woodford M. (1995). Price Level Determinacy without Control of a Monetary Aggregate. *Carnegie Rochester Conference Series on Public Policy*, 43, 1-46.

Woodford M. (2001). Fiscal requirements for price stability. *Journal of Credit, Money and Banking*, 33, 669-728.