Managing Government Default Risk

in Federal States

By

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Abstract

Federal governments typically apply fiscal rules to impose fiscal discipline on lower levels of government. Analogously, by trading in government debt, government bond markets impose fiscal discipline on lower levels of governments. This paper finds new evidence for Australia, Canada and Germany showing that whether these rules or markets matter, or not, may be a function of the world's appetite for credit risk. Rules and markets only tend to bite during periods when there is a low appetite for credit risk in world financial markets. Therefore, this paper proposes an alternative more incentive-based framework of fiscal discipline. This incentive-based framework should increase the sensitivity of government borrowing costs with respect to debt levels, increase the geographical diversification of investor's portfolios with respect to government bonds, and prevent government financing from fuelling private or public sector bailout expectations.

JEL Classification: H6, G18, G28.

Keywords: Government default risk, fiscal rules, government bond markets, federal states.

1. Introduction

Like state/provincial governments in federal states, national governments in EMU are expected to be constrained in the way they finance their deficit. The credit status of EMU governments will be analogous to the 50 states of the US or the 10 provinces of Canada. Government bonds issued by EMU member states will bear credit or default risk since no national government will have the sole authority for printing or creating Euros.[1] Thus, national governments in EMU no longer can halt a process of falling bond prices and rising interest rates by monetising their debt. McKinnon (1997) argues that "when the national government owns its own central bank, everybody knows that, in a crisis, the government can always print money, that is use the inflation tax, to pay interest and principal and thus avoid outright default on the face value of its obligations. Because easy (potential) access to monetary seigniorage greatly reduces any risk of outright default, the government that owns the central bank can pre-empt the national capital market to issue Treasury securities at lower interest rates than can high-quality private borrowers whose debt is denominated in the national currency." Similarly, Goodhart (1998) argues that "once national authorities give up their command over money creation, they lose the unchallenged absolute ability to pay off their domestic currency debt, interest and principal, in legal tender, whatever may happen to demand in the bond market." Finally, Bishop (1998, p. 17) argues: "With modern and efficient capital markets of a global scale, there will be no need for Euro investors to expose themselves unnecessarily to such a risk so prudent institutions may seek to diversify away from perceived risk. So a sudden liquidity crisis is entirely possible." This paper is about the management of default or credit risks in federal states. This involves measures that reduce the *likelihood* of government default.[2]

Generally, there are two groups of thought on how to reduce the likelihood of government default. The first group argues that fiscal rules are needed to discipline governments. Fiscal rules such as deficit, debt or expenditures limits, a golden rule (that public borrowing must not exceed public investment) or a balanced budget law are theoretically justified if they help to avoid government debt accumulation, increasing the potential for a reduced default risk premium on government borrowing rates. I shall call

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[1] All domestic bonds issued by EMU member states will reflect the same currency and inflation risk.

[2] There have been no recent examples of actual state or provincial government default in the more advanced federal states. The most prominent cases of local governments experiencing fiscal problems were Orange County and New York City. On 6 December 1994, Orange County, one of California's most affluent regions, became the largest US municipality ever to file for bankruptcy; the move followed the revelation of investment losses of at least $ 1.5 billion and the refusal of several Wall Street banks to renew the municipality's short-term loans (Keesing's Record of World Events, p. 40315). The investment losses were due to speculation in the municipal bond market by the county treasurer. Speculation and the unwillingness to resume debt service rather than irresponsible fiscal behaviour caused the default. New York City came close to defaulting on some notes but eventually with the assistance of the State of New York it was able to continue debt service.

this the *rule-based fiscal disciplining hypothesis.*[3] The second group argues that markets discourage governments from running persistent deficits by demanding compensation for the additional probability of default that results from prolonged debt accumulation and eventually by limiting the availability of credit as borrowing becomes excessive (Bishop, Damrau and Miller, 1989). I shall call this the *market-based fiscal disciplining hypothesis.*[4] This paper will examine whether rule- and/or market-based fiscal discipline is effective in lowering government borrowing costs and whether alternatives are available.[5] The paper makes the following contributions:

US and other federal states

Most of the existing literature that has tested for the rule- and market-based fiscal disciplining hypothesis draws on US states (see Table 1 in Section 2). It is not clear, however, whether the US evidence necessarily carries over to other federal states and to EMU. Indeed, the US may be a special case in part since municipal bonds are exempt from US federal income taxation. Because of this tax-advantage, the equilibrium nominal interest rates on states and municipal bonds are significantly less - about 2 percentage points - than on US Treasury or high-grade corporate bonds (McKinnon, 1997). So, in the US resident individuals and corporations tend to hold more state debt in stead of banks and institutional investors. Foreigners, who would not receive the tax advantage, do not buy them, and the market becomes narrowly "onshore" in US dollars. This makes it easier for the US federal government to ignore bankruptcies in any one state or locality, i.e. no bailout, because such a bankruptcy would not impair the country's international credit rating, and, possibly the standing of the other states (McKinnon, 1997). However, in Europe (see Table 9 in Section 4) and other federal states such as Australia, Canada and Germany resident individuals and corporations do not receive this tax advantage. Banks and institutional investors often hold significant proportions of their own government's debt within their asset portfolios. The large credit exposures of banks and institutional investors to their own government could endanger the stability of the EMU financial system and thereby increase the pressure on the European Central Bank (ECB) or other governments to buy up the

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[3] A large literature in public finance has examined the effect of fiscal rules on deficits as opposed to the effect of fiscal rules on government borrowing costs. Von Hagen (1991, p. 209) concludes that fiscal rules have little effect on fiscal performance: "Fiscal restraints do not seem to significantly affect average fiscal performance other than the choice of debt instruments." But Von Hagen also runs non-parametric tests that reveal that formal fiscal restraints do have significant effects on the likelihood of per capita debt. Two other studies, ACIR (1987) and Poterba (1996) found that fiscal rules do matter in that they induce smaller deficits. In principle, EMU member states running deficits to GDP of more than 3% will be subject to sanctions (fines), though the Stability and Growth Pact (1996) establishes that EMU member states running excessive deficits of 3% or more will be automatically exempt from these sanctions in the event of a natural disaster or if they experience a fall in GDP of at least 2% over a year. In cases where GDP has fallen between 0.75% and 2% the imposition of sanctions will be dependent on political judgement (voting by EU finance ministers). Countries experiencing negative GDP growth of less than 0.75% will suffer sanctions if they run excessive budget deficits.

[4] Bishop et al. (1989) argue that three conditions must be satisfied in order for market-based fiscal discipline to work: (1) capital must be able to move freely, (2) full information must be available on the creditworthiness, and the debts of the borrowers, and (3) the market must be convinced that there is no possibility of bail-out - that there are no formal or implicit guarantees that obligations will be met.

[5] Note that there may be a trade-off between the objective of reducing government borrowing costs and the objective of containing risk, that is, insulating the government portfolio from interest rate shocks (Missale, 1998, p. 5).

troubled government's bonds. So it is important to test the robustness of the US evidence on new data sets.

World's appetite for credit risk

Whether rule and/or market discipline matters, or not, may be a function of the broader economic conjuncture as for example measured by the *world's appetite for credit risk* (see Appendix C). I argue that rules and markets bite during certain periods, but not during other periods. This follows from an inspection of the graphs of 10-year government bond yield differentials of state/provincial governments vis-à-vis the federal government and debt-to state GDP ratios in Appendix A. The development of yield differentials seems quite different from the development of debt-to-state-GDP ratios. This leads me to believe that there is something missing. I argue that the impact of rule- versus market-based fiscal discipline is connected with the world's appetite for credit risk. The development of state/provincial yield differentials with respect to the federal government is remarkably similar across federal states. State/provincial government bond yields in Australia, Canada, Germany, Switzerland[6] and the US[7] had dramatically dropped to the federal yield level just before the outbreak of the Asian crisis in 1997 and the Russian default of August 1998.[8] In the aftermath of the Asian crisis and the Russian default differences between provincial and federal yields widened considerably. The Economist (1999) provides the following explanation: "After Russia's default, in particular, investors eschewed all kinds of risk. As in every financial crash since the 17th-century tulip crisis, greed suddenly turned to fear. The difference this time was that the effect was global, not just local. When markets panicked after Russia's crash, the impact was felt everywhere, from Brazil to American municipal bonds." I argue that this is due to shifts in investor's attitudes away from credit risk prompting a "global flight to quality" and thus increasing the yield differentials between lower levels of government and the federal government. Or in other words, provinces may find it more difficult to issue new bonds than the federal government due to a reduction in demand for "risky" provincial debt. During times of a low appetite for credit risk there is a perception that lower levels of government are more likely to default than federal governments. In the econometric tests the world's appetite for credit risk will be measured by the ratio of an index of emerging markets' sovereign debt (SALOMON BRADY BOND INDEX (USD)) and an index of G7 countries' sovereign debt (SALOMON G-7 INDEX (USD)) (in percentages). The paper finds new evidence for Australia, Canada and Germany showing that whether rules or markets matter, or not, may be a function of the world's appetite for

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[6] This follows from a plot of yield differentials of Swiss Cantons with respect to the Bund based on data obtained from Datastream (available upon request).

[7] This follows from a plot of *20 Year General Obligation Bond Trading Values* obtained from the Chubb Corporation (available upon request).

[8] This is also partly due to budget tightening in Canada and the United States (McKinnon, 1997).

credit risk. Rules and markets only tend to bite during periods when there is a low appetite for credit risk in world financial markets.

Political risks

I shall also control for the most obvious state-specific political risks. For example, during state elections and referenda, large swings in yield differentials are observed. Specifically, the higher political risks associated with Québec are estimated by applying Gallup opinion poll survey data and election results showing the popularity of the Bloc Québécois.

Budget rules

The existing literature often applies a budget rules stringency index (for example, ranging from 1 to 10 or otherwise) to test for the rule-based fiscal disciplining hypothesis. To clear the budget stringency index of any spurious cardinality and to limit the extent of possible classification error, the use of dichotomous variables is advisable. It is better to transform the available data range into a dummy variable. By transforming every class in a zero-one variable no pre-estimate restrictions are put on the possible relationship between budget rules and yield differentials (Siermann, 1996). I include in my regressions a fiscal stringency dummy variable FISC (which takes the value of 1 for states during times when strong fiscal rules are in place and 0 otherwise).

Liquidity risk

A general drawback of the existing literature is that *credit* and *liquidity risks* are always lumped together. In addition to credit considerations, I expect liquidity to play a central role in the determination of yields in EMU government bond markets (see also McCauley, 1999 and Financial Times, 1999c).[9] Liquidity risk is the risk that an investor may not be able to liquidate an investment in debt securities within a reasonable time at a reasonable price. Governments desire to minimise debt service costs. A liquid secondary market makes it easier for governments to issue large amounts of public debt at relatively low costs since investors feel more confident in their ability to purchase the issue in the primary market and subsequently trade the issue in a liquid secondary market. The smaller the size of the debt issue, the higher the liquidity premium a government has to pay to investors to buy its government bonds. I will assess differences in the level of liquidity across states/provinces by the relative amount of gross new domestic debt issues of each province/state over time. In this study, I am unable to assess how differences in the structure and organisation of state/provincial debt markets cause market liquidity to differ across states/provinces.

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[9] EMU government default risk premiums are very small (Lemmen and Goodhart, 1999).

The remainder of the paper is organised as follows. In Section 2 I begin with a review of the existing literature that has examined the rule- and market-based fiscal disciplining hypothesis. Following this review, Section 3 applies a simple model to examine the rule- and market-based fiscal disciplining hypothesis for Australia, Canada and Germany. The empirical testing of this takes the form of standard pooled and fixed-effects regressions.[10] I control for the world's appetite for credit risk and the size of gross new domestic public debt issues over time. Section 3 includes also a brief description of each federal system and its credit implications. Section 4 argues in favour of a more incentive-based framework of fiscal discipline. I give some suggestions for imposing fiscal discipline on governments in the Euro zone. Finally, Section 5 concludes.

2. The literature on the rule- versus market-based fiscal disciplining hypothesis

Table 1 summarises the literature and Appendix B reviews the theoretical model underlying the majority of the literature used to test the rule- versus market-based fiscal disciplining hypothesis. The market-based fiscal disciplining hypothesis suggests that financial markets first discipline with rising risk premiums reflecting the higher probability of default that results from an increase in the relative supply of debt (*linear* relationship between yield and debt). Second, if deficits persist, the default premium would increase at an increasing rate until, eventually, the offending country would be denied access to additional credit (*non-linear* relationship between yield and debt). The increase in the cost of borrowing, along with the threat of reduced availability of credit, would then provide an incentive to correct irresponsible fiscal behaviour.

Bishop, Damrau and Miller (1989) found that New York City borrowing expenses rose from 4% of the City's funds in 1965 to 53% in 1975. The spread between medium grade and prime long-term municipal bonds averaged between 40-50 basis points in 1974 and 60-70 basis points in 1975, and around 100 basis points at the height of the New York City's fiscal crisis. Though, within a year the spread had fallen back to 20 basis points.

Goldstein and Woglom (1991) and Bayoumi, Goldstein and Woglom (1991) also find empirical support for the market-based fiscal disciplining hypothesis. In addition, they find evidence for the rule-based fiscal disciplining hypothesis. Goldstein and Woglom (1991) examine a panel of 39 US states' general obligation bonds relative to New Jersey with comparable 20-year maturity and other characteristics obtained from the Chubb Corporation. Applying pooled OLS techniques, they estimate

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[10] Testing for individual states/provinces requires long time-series, which are only available for the United States.

a linear specification of default risk as in (8) (see Appendix B) over the sample period 1982-1990. They find that for US states the spread increases by 9.98 basis points for every percentage point increase in debt. They also find default risk differentials to decrease by 0.40 basis points with respect to the squared debt ratio as specified in (9). That is, the authors do not find evidence for credit rationing of US states. Finally, more stringent budget rules are found to decrease government borrowing costs by 2.01 basis points relative to states with average stringency.

Bayoumi, Goldstein and Woglom (1995) (henceforward BGW) generally confirm these results, using the non-linear specification in (7) for the supply curve of government debt. BGW find that for US states the spread increases by 18.91 basis points for every percentage point in additional debt to gross state product. Importantly, they find that borrowing costs rise at an increasing rate as the state debt-to-GDP ratio increases. Capital markets begin to ration credit to state governments at relatively low levels of debt to gross state product (8.7%) - low compared to the average EMU-11 debt-to-GDP ratios in 1998 (73.8%). They also find that the degree that the risk premiums change as stringency increases is dependent on the level of debt. The state debt-to-GDP level at which credit rationing begins is higher when the state has a more rigid fiscal constraint. At average levels of debt, varying stringency of budget constraints can lower risk premiums by over 4 basis points.

Alesina, De Broeck, Prati and Tabellini (1992) analyse, among others, the impact of an increase in debt-to-GDP ratios on default risk measured as the difference between government debt yields relative to corporate debt yields. They find that the government borrowing costs increase by 1.51 basis points for every percentage point in additional debt-to-GDP (in first differences) in a sample of 12 OECD countries during 1978-1989.

Poterba and Rueben (1997) find borrowing costs to increase by 92.1 basis points for every percentage point increase in debt-to-gross state product. In the same regression, lax anti-deficit rules increase borrowing costs by 8.42 basis points, a debt limit lowers borrowing costs by 5.38 basis points, binding expenditure limits lower borrowing costs by 7.08 basis points and binding revenue limits increase borrowing costs by 17.61 basis points.

Mattina and Delorne (1997) apply the linear specification (8) and the non-linear specification (9) to yield differentials of Ontario (1965-1996), Québec (1975-1996) and Nova Scotia (1965-1996) relative to British Columbia. The linear model indicates that the risk premium increases by 2.57 (Ontario), by 2.15 (Québec) and by 2.01 basis points (Nova Scotia) for every percentage point increase in provincial debt-to-GDP. The non-linear model indicates that for every percentage point increase in the squared

Study	Measure of government default risk	Impact of 1% change in debt to GSP/GDP (linear) (basis points, t-statistic in parentheses)	Impact of 1% change in squared debt to GSP/GDP (non-linear) (basis points, t-statistic in parentheses)	Impact of 1% change in exponential debt to GSP/GDP (non-linear) (basis points, t-statistic in parentheses)	Impact of BGW debt-service (non-linear) (basis points, t-statistic in parentheses)	Impact of fiscal rule(s) (basis points, t-statistic in parentheses)
Bishop, Damrau and Miller (1989)	New York City debt crisis of 1975, Spread between medium grade and prime long-term municipal bonds averaged	Between 40-50 in 1974, 60-70 in 1975, and around 100 basis points at the height of the New York City crisis (mid-1975)				
Goldstein and Woglom (1991)	39 US states 20-year general obligation bond yields relative to New Jersey, 1982-1990	Pooled OLS: 9.98 (4.92)	Pooled OLS: -0.40 (1.55) Reject non-linearity			Pooled OLS: -2.01 (8.18) ACIR stringency index ranging from 1 to 10
Alesina, De Broeck, Prati and Tabellini (1992)	12 OECD government debt yields relative to corporate debt yields (time to maturity not always equal), 1978-1989	Pooled OLS: 1.51 (3.52) for first difference of debt-to- GDP				
Bayoumi, Goldstein and Woglom (1995)	38 US states tax exempt 20-year general obligation bond yields relative to New Jersey, 1981-1990	Pooled 2SLS: 18.91 (1.97) At mean debt/GSP levels, 1% increase in debt, increases yield by 23 bp. At one standard deviation above mean debt/GSP level, yield increases by 35 bp.			Pooled 2SLS: 0.11 (2.2) Credit rationing at debt/GSP levels of 8.7%, 25% above the maximum debt/GSP level in the data (7.1%) Accept non-linearity	Pooled 2SLS: -4.10 (3.94) ACIR stringency index ranging from 1 to 10

Rueben (1997)	yields 20-year general obligation bond yields relative to New Jersey, 1973-1995				(1.29) (lax anti-deficit rules) Limit on issuing debt: -5.38 (-1.11) Binding expenditure limit -7.08 (-1.97) Binding revenue limit: 17.61 (-2.66)
Mattina and Delorne (1997)	Ontario (1965-1996), Québec (1975-1996) and Nova Scotia (1965-1996) bond yields relative to yields in British Columbia	OLS: 2.57 (0.04) Ontario OLS: 2.15 (0.001) Nova Scotia OLS: 2.01 (0.001) Québec Note: p-values between parentheses.	OLS: 0.10 (0.028) Debt^2 Ontario OLS: 0.04 (0.001) Debt^2 Nova Scotia OLS: 0.05 (0.0005) Debt^2 Québec Note: p-values between parentheses		
Le Flandreau, Cacheux and Zumer (1998)	15 European countries on gold standard, spread of country=s government bond yield over the risk-free British consul, 1880-1913	Pooled IV: 5.645 (4.69) Pooled IV: 1.732 (3.06)	`	Pooled IV: 1.449 (6.28) Pooled IV: 0.356 (10.18)	-0.398 (-1.36) -0.345 (-3.39) -0.528 (-3.22) AOn Gold@ dummy variable taking the value of 1 if the

						gold standard, and 0 otherwise
Lemmen and Goodhart (1999)	12 and 13 EU countries, 10-year government debt yields less 10-year interest rate swap yields, subperiod 1992-1996	Fixed effects: 1.51 (5.81) for first difference of debt-to-GDP for 13 EU countries (excluding Greece and Luxemburg) Fixed effects: 1.14 (4.96) for first difference of debt-to-GDP for 12 EU countries (excluding Greece, Italy and Luxemburg)				

Notes:

OLS = Ordinary Least Squares
Pooled IV = Pooled Instrumental Variables
Pooled 2SLS = Pooled Two-Stage-Least-Squares
bp. = basis points (1 basis point is 0.01%)

3. The explanation of the state-federal yield differential

Next, I analyse the impact of rule- and market-based fiscal discipline on state-federal yield differentials. The state-federal yield differential is measured by the difference between the yield on 10-year state/provincial government bonds and the yield on 10-year federal bonds. Thus, the default risk premium is defined in terms of the federal yield, which acts as the reference point. The default risk premium on federal government bonds should be low and stable in comparison to that of the states because of its favourable financial position, its ultimate control of money creation and its taxing autonomy.

The market-based fiscal disciplining hypothesis is modelled through $DEBT$ (linear impact) and $DEBT^2$ (non-linear impact). The rule-based fiscal disciplining hypothesis is modelled through $FISC$, a dummy variable which takes the value of 1 for states/provinces during times when strong fiscal rules are in place and 0 otherwise. The vector X includes the world's appetite for credit risk ($APPETITE$) and the relative amount of gross new domestic debt issues for each province/state (AIS). $APPETITE$ is measured by the ratio of an index of emerging markets' sovereign debt (SALOMON BRADY BOND INDEX (USD)) and an index of G7 countries' sovereign debt (SALOMON G-7 INDEX (USD)). If the indices move closer to each other (away from each other) the world's appetite for credit risk declines (increases). The narrower (wider) the difference between both indices, the lower (higher) the appetite for credit risk in world financial markets. AIS is measured as the amount of gross new domestic debt issues of each province/state in percentage of total of gross new domestic debt issues of all provinces/states.

For Australia and Germany, due to the unavailability of debt and/or GDP at a quarterly frequency, I necessarily have to rely on annual data. Since for Australia and Germany I also do not have information on fiscal rules I arrive at the following simple regression specification for Australia and Germany (see Appendix B for derivation):

$$S_{i,t} = b_0 + b_1\, DEBT_{i,t} + b_2\, DEBT^2_{i,t} + b_3\, APPETITE_{i,t} + b_4\, AIS_{i,t-1} + e_{i,t}$$

where i indexes states/provinces and t indexes time.

For Canada the regression also includes a proxy for fiscal stringency ($FISC$) and a proxy for the popularity of Bloc Québécois (BQ). BQ is measured by the ratio of the number of votes for Bloc Québécois in percentage of the total number of votes. The variable BQ relates to Québec only and is

zero for the other provinces. The availability of quarterly data for *AIS* allows me to use the sum of the gross new provincial debt issues in the previous four quarters in percentage of the total of all provincial issues to remove the simultaneity problem between debt and the amount of gross new debt issues (countries with higher debt ratios often have more liquid markets). I arrive at the following simple regression specification for Canada:

$$S_{i,t} = b_0 + b_1\,FISC_i + b_2\,DEBT_{i,t} + b_3\,DEBT_{i,t}^2 + b_4\,APPETITE_{i,t} + b_5\,BQ_{i,t} + b_6 \sum_{j=1}^{4} AIS_{i,t-j} + e_{i,t}$$

The estimations of both specifications will be supplemented with a descriptive analysis of the particular features of federal systems that are believed to be relevant for the size of the default risk premium. The descriptive analysis serves two purposes; it increases our understanding of the working of existing federal systems, its credit implications and it highlights the differences with the federal system in EMU.

A final word of caution is in order here. There are a host of other variables that could contribute to the explanatory power of the default risk premium.[11] The empirical model set out in this section necessary entails a balance between a parsimonious econometric specification and the risk of omitted variable bias. Debt in EMU may also not generate the same default risk premium for any given percentage of national debt as does state or provincial debt. There are important structural and institutional differences between federal states such as the US and Canada and EMU. Beside differences in taxation, labour mobility in EMU is much lower than in other federal states which makes it easier in the latter to discipline higher spending governments by moving to another jurisdictions, that is, the tax base in other federal states is more variable than in Europe. The federal government in the US (25% of aggregate US GDP) and other federal states is much larger than in Europe (1.3 % of aggregate EU GDP). The degree of fiscal federalism within the EMU is nowhere near as advanced as in other federal states. So, the effect of federal grants and aid programmes on default risk premiums is rather modest in the EU (Goodhart, 1997). The subsequent section reports on the estimation results.

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[11] For example, the dependency ratio - which expresses federal cash transfers as a proportion of total revenues - measures state's vulnerability in meeting its financial obligations in the event of federal transfer restraints. The income-gearing ratio, which expresses debt-servicing charges as a proportion of total revenue, is another potential indicator of unsustainable borrowing. Unfortunately, these ratios tend to exhibit few innovations in the data-generating process, thereby limiting their usefulness as explanatory variables. Further, the relative small number of observations available from quarterly data (Canada) and annual data (Australia and Germany) necessarily requires a parsimonious econometric specification.

Australia

The Australian federal system

Australia is a federal state consisting of six states - New South Wales, Queensland, South-Australia, Tasmania, Victoria, Western-Australia - and two territories - the Northern Territory and the Australian Capital Territory. The financial relationship between the Commonwealth government and the states derives in part from the Australian states' limited ability to raise own-source revenues (OECD, 1997). While the states account for nearly 50% of total general government outlays, they are responsible for raising only 24% of taxation. The amount of own-source revenue raised by the Commonwealth is considerably larger than its own-purpose outlays (OECD, 1997). Fiscal patterns are characterised by large flows of funds from the federal level (which collects about three-quarters of all tax revenues) to the states. These revenue sharing transfers account for in excess of 50% of the states= total general government revenues.[12]

The Australian states' borrowings are regulated by the Australian Loan Council, an institution dominated by the Commonwealth. The aggregate borrowings of off-budget authorities are similarly regulated through limits on total new borrowings (OECD, 1997). The Loan Council *de facto* has control over the fiscal policies of each of the states. Global limits were imposed on all public sector borrowings by each state. International borrowing is further limited as percentage of each state=s global limit. In exchange for global limits on their borrowing, the Commonwealth government has granted the states' borrowing authorities access to international capital markets that had previously been closed to them.

Credit implications: Australia

The system of revenue sharing transfers provides the states with a secure, ongoing source of revenue that is largely independent of regional cyclical swings that may disproportionately affect one state. When combined with states' own, less income-sensitive tax bases, the revenues of the Australian states are not as closely linked to the states' economy as is often the case for the Canadian provinces and the US states. The comprehensive system of fiscal equalisation in Australia provides a safety net for any state experiencing a deterioration in its relative fiscal capacity. These arrangements provide particular benefits to the less populous, otherwise fiscally weaker states. The Australian federal system also provides scope for discretionary support from the Commonwealth. This support is not automatic, as the Commonwealth provides no explicit guarantee of state obligations. The absence of automatic Commonwealth support thus allows scope for credit

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[12] The Commonwealth raises revenue largely as a result of its monopoly of income tax collections.

differentiation among the states based on their relative economic and financial strengths. The Commonwealth nevertheless is a source of strong support for the states. The Commonwealth would be likely to work with a state experiencing fiscal difficulties to ensure ultimate repayments, for several reasons: (1) the Commonwealth historically has been the largest single creditor of the states and so retains a strong interest in preventing a default; (2) the existence of large Commonwealth funded Special Purpose Payments (SPP) programs administered by the states gives the Commonwealth a strong interest in maintaining the ongoing viability of state operations; and (3) the Commonwealth's own standing in financial markets remains linked with that of the states, with any failure or delay by a state in meeting debt servicing obligations likely to rebound adversely on Commonwealth's access to funds.

Table 2 shows the average yield differential of Australian states over the Commonwealth for bonds with a remaining maturity of *close to* 10 years. Due to this fact the data in Table 2 must be treated cautiously. Yield differentials have at times exceeded 100 basis points.

Table 2: Australian states average yield differential with Commonwealth (in basis points)

	New South Wales	Queensland	South Australia
	10-year	10-year	10-year
1989	89	88	97
1990	56	66	70
1991	68	68	105
1992	42	38	112
1993	30	26	61
1994	34	31	53[a]
1995	30	26	21[b]
1996	24	27	.7[c]
January ›97-June ›97	25	25	-20[d]
	Tasmania	**Victoria**	**Western Australia**
1989	116	99	102
1990	87	74	83
1991	129	105	101
1992	103	90	63
1993	38	60	28
1994	26	44	34
1995	32	39	31
1996	26	24	20
January ›97-June ›97	11	17	10

Notes:

[a] Remaining maturity 9 years.
[b] Remaining maturity 8 years.
[c] Remaining maturity 7 years.
[d] Remaining maturity 6 years.

Source: Own calculations from data obtained from Queensland Treasury Corporation for all Australian states. See also Appendix D.

Table 3 presents pooled and fixed-effects regressions of the non-linear model for Australia, based on annual data. New South Wales is taken as the reference-state in the fixed-effects regressions (3) and (4). Because of the limited number of observations on which the estimations are based the results have to be interpreted with care. For the Australian states I do not have access to the gross new issues of public debt. State and Territory debt security issuance since the mid 1980's has been concentrated in the so-called State Central Borrowing Authorities (CBA's). CBA's issue AUD denominated debt securities in Australia, and AUD and FX denominated debt securities offshore (e.g. euromarkets). Unfortunately these data are collected under the Census and Statistics Act which does not permit disclosure of data without consent of any of the states.

In regression (2) borrowing costs increase by 4.79 basis points for every percentage point increase in states debt-to-GDP and decreases by 0.06 basis points for every percentage point increase in squared state debt-to-GDP. The results in regression (2) of Table 3 indicate that a one percent higher appetite for credit risk in world financial markets lowers states borrowing costs by 0.72 basis points. The world's appetite for credit risk accounts for an important part of the cross-sectional variation in yield differentials. The results in all four regressions show that Australian states are not credit rationed.

Table 3: The non-linear model for Australia: 1990-1996

Explanatory variables	(1)	(2)	(3)	(4)
Constant	-58.51 [36.24]	68.62 [36.90]*		
Queensland			-6.28 [11.62]	7.72 [9.58]
South Australia			-9.88 [12.10]	-1.16 [10.35]
Tasmania			10.89 [23.39]	12.53 [17.81]
Victoria			16.62 [26.00]	18.50 [20.59]
Western Australia			7.55 [16.24]	7.68 [12.48]
$DEBT_{i,t}$	6.45 [2.36]**	4.79 [2.18]**	3.28 [0.75]**	7.75 [1.20]**
$DEBT_{i,t}^2$	-0.08 [0.03]**	-0.06 [0.03]**	-0.05 [0.02]**	-0.11 [0.02]**
$APPETITE_{i,t}$		-0.72 [0.11]**		-0.58 [0.13]**
S.E. of Regression	28.92	23.46	30.43	25.03
$\overline{R}^2$	0.11	0.42	0.02	0.33
N	42	42	42	42

Notes:

(1) $S_{i,t} = b_0 + b_1 DEBT_{i,t} + b_2 DEBT_{i,t}^2 + e_{i,t}$

b   **b**   **b**   **b**(175 P1 .25 0. 0ti lTD (i)e Tjt -31.5 -0.75 TD 0.375 Tc75 P1 .25 0.75 TD ((0) Tj -20.25 0.75 TD 0.335 T75 P1 .25

15

$$(3) \quad S_{i,t} = \sum_{i=1}^{n} a_i \ DUM_i + b_1 \ DEBT_{i,t} + b_2 \ DEBT_{i,t}^2 + e_{i,t}$$

$$(4) \quad S_{i,t} = \sum_{i=1}^{n} a_i \ DUM_i + b_1 \ DEBT_{i,t} + b_2 \ DEBT_{i,t}^2 + b_3 \ APPETITE_{i,t} + e_{i,t}$$

[*] Significantly different from zero at 95 per cent level of confidence (one-sided test)
[**] Significantly different from zero at 99 per cent level of confidence (one-sided test)

White heteroskedasticity-consistent standard errors are between brackets.

Source: See Appendix D.

Canada

The Canadian federal system

Canada is a federal state of ten provinces (Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, Québec, Saskatchewan) and two territories (the Yukon Territory and the Northwest Territory). As a general principle, the provincial and federal levels have equal powers in raising taxes. All provinces have the right to impose their own income tax. In general, they top-up federal taxes on a percentage basis. Provinces also have the right to raise taxes through social insurance charges, and through indirect taxation (sales taxes). Three of the provinces have their own collection system for corporate taxes. All other provinces raise corporate income taxes using the federal corporate income tax structure and administration (OECD, 1997). The Federal government has since the start of the Confederation made transfer payments to provinces to ensure equity in public services across the provinces and to allow them to carry out their responsibilities. Federal transfers to provinces and territories constitute an important source of provincial revenue and have expanded enormously over the last decades (OECD, 1997).

Credit implications: Canada

In Canada provincial governments have more power to act independently with respect to expenditures and taxes. Both the Canadian and US federations are more market oriented. Credit ratings exert considerable market discipline on the provinces and the states. Interestingly, Canada unites market discipline with a successful and wide-ranging system of monetary transfers to the provinces - without being seen as an implicit guarantee of provinces' budgetary deficits (Bishop, Damrau and Millar, 1989).

The provincial governments in Alberta, Manitoba, New Brunswick, Nova Scotia, Québec and Saskatchewan have recently introduced restrictions on fiscal activities to control debt accumulation.

I am interested in the effect of these budget constraints on provincial borrowing costs. It is unclear if borrowing costs have decreased for the provinces with legislated budget constraints compared to those provinces without legislated budget constraints (note that most of the legislation was passed in 1995 and 1996). In 1997, the average yield differential over 10-year government of Canada benchmark bonds for the provinces with legislated budget constraints (Alberta (8), Manitoba (13), New Brunswick (16), Nova Scotia (23), Québec (39) and Saskatchewan (16), which is an average of 19) was only moderately lower (7 basis points) than the average yield differential for the provinces without legislated budget constraints (Newfoundland (33), Ontario (17) and Prince Edward Island (27), which is an average of 26). Over the first eleven months of 1998, the average yield for the provinces with legislated budget constraints (Alberta (17), Manitoba (25), New Brunswick (26), Nova Scotia (34), Québec (47) and Saskatchewan (25), which is an average of 29) was again only 7 basis points lower than the average yield differential for the provinces without legislated budget constraints (Newfoundland (43), Ontario (27) and Prince Edward Island (39) which is an average of 36). The above calculations are based on Table 4. Also for Canada, yield differentials have at times exceeded 100 basis points.

Table 4: Canadian provinces average yield differential with federal government (bid side) (in basis points)

	Alberta					British Columbia				
	2-year	3-year	5-year	10-year	30-year	2-year	3-year	5-year	10-year	30-year
6/92-12/92	26	28	40	55	47	29	30	44	57	50
1993	13	25	35	50	45	15	26	36	51	46
1994	15	18	19	28	36	15	17	20	29	36
1995	11	13	16	18	24	11	13	16	20	25
1996	7	8	9	11	19	8	9	10	15	23
1997	4	4	6	8	12	7	7	9	15	21
1/98-11/98	7	8	11	17	23	12	15	19	29	40
	Manitoba					New Brunswick				
6/92-12/92	40	43	59	74	68	41	44	60	74	68
1993	22	35	51	65	59	22	34	50	64	59
1994	18	21	29	40	48	19	22	30	43	50
1995	17	20	23	29	37	18	20	24	33	40
1996	10	9	10	18	28	12	11	13	23	33
1997	7	7	10	13	21	7	8	11	16	22
1/98-11/98	11	14	17	25	35	11	14	18	26	35
	Newfoundland					Nova Scotia				
6/92-12/92	79	82	101	119	119	51	54	71	88	84
1993	59	78	101	119	116	34	50	69	85	83
1994	38	41	61	83	95	29	32	44	64	75
1995	50	52	57	75	84	31	33	37	49	58
1996	35	34	36	52	62	21	20	21	32	42

	Prince Edward Island					Saskatchewan				
6/92-12/92	69	72	88	104	101	67	70	87	109	106
1993	49	70	87	106	101	51	71	88	108	103
1994	34	37	52	73	81	28	32	45	64	72
1995	37	40	44	58	67	23	26	30	39	48
1996	24	23	24	39	49	13	12	13	24	34
1997	14	15	20	27	37	7	7	11	16	23
1/98-11/98	17	22	28	39	54	11	14	17	25	35
	Ontario					Québec				
8/88-12/88			39	45				73	93	
1989			39	45				71	85	
1990			50	55				79	97	
1991			60	58				78	89	
6/92-12/92	39	42	61 (1992)	73 (1992)	66	50	55	75 (1992)	91 (1992)	92
1993	26	41	58	73	68	29	45	62	87	85
1994	20	24	34	49	58	29	33	49	83	90
1995	19	22	26	35	43	28	34	52	72	80
1996	12	11	12	23	33	17	19	30	47	59
1997	7	8	11	17	25	14	15	24	39	46
1/98-11/98	11	15	18	27	39	17	20	28	47	60

Source: Own calculations with weekly data obtained from CIBC Wood Gundy Securities. See also Appendix D.

Table 5 summarises the characteristics of Canadian provincial budget rules. The budget stringency dummy variable *FISC* takes the value of 1 for states during times when strong fiscal rules are in place (Alberta, Manitoba and Québec), and 0 when weak or no fiscal rules are in place. A more formal analysis of provincial-federal yield differentials is needed to determine whether budget constraints legislated by the provinces have lowered provincial government borrowing costs.

Table 5: The characteristics of Canadian provincial budget rules

Province	Budget Stringency Dummy variable (FISC)	In effect since:	Apply to realised deficits	Concrete debt elimination provision	Single-year budget period	Penalties for not achieving balance	Referendum requirement for tax changes	Escape clauses
Alberta	1	1993	Yes	Yes	Yes	No	No[d]	Yes
British Columbia	0	-	-	-	-	-	-	-
Manitoba	1	1995	Yes	Yes	Yes	Yes	Yes	Yes
New Brunswick	0	1993	Yes	No[b]	No[c]	No	No	Yes
Newfoundland	0	-	-	-	-	-	-	-
Nova Scotia	0	1996	No[a]	No	Yes	No	No	Yes
Ontario	0	-	-	-	-	-	-	-
Prince Edward Island	0	-	-	-	-	-	-	-
Québec	1	1996	Yes	No	Yes	No	No	Yes
Saskatchewan	0	1995	No	No	No[b]	No	No	Yes

Table 6 presents pooled and fixed-effects regressions of the non-linear model for Canada. The vector of variables X in the first regression includes a fiscal dummy variable $FISC$. I control for higher political risks associated with Québec (BQ), the world's appetite for credit risk (APP), and the relative amount of gross new provincial debt issues ($\sum_{j=1}^{4} AIS_{i,t-j}$). In the fixed-effects regressions (3) and (4) Ontario is taken as the reference-state.

Regressions (1) to (4) do not indicate that Canadian provinces are credit rationed. This contrasts with findings of Mattina and Delorne (1997). Provincial borrowing costs increase with 0.75, 0.62, 1.22 and 1.95 basis points for every percentage point increase in debt to provincial GDP decreases by 0.006. 0.004, 0.01 and 0.01 basis points for every percentage point increase in squared provincial debt-to-GDP (regressions (1) to (4)). Fiscal rules matter, but less so when the world's appetite for credit risk is included in the regression (compare regression (1) with regression (2) and regression (3) with regression (4)). An increase in the world's appetite for credit risk lowers borrowing costs with 0.41 (regression (2)) or 0.32 basis points (regression (4)). The political risks associated with Québec notably increase provincial borrowing costs by 3.68 (regression (2)) basis points for every one percent increase in the Bloc Québécois' share of the aggregate Canadian vote. There is clearly more risk relative to Ontario associated with Québec and Manitoba. I also ran regressions excluding Québec from the sample. The coefficient estimates for regressions (2)-(4) were of the same magnitude as those in Table 6. Only for regression (1) the coefficient for debt and debt squared were found to be different: 0.02 [0.38] and -0.0001 [0.003]. Finally, I obtain a positive coefficient estimate for the sum of the gross new debt issues in the previous four quarters in percentage of the total of all provincial issues. This result indicates that an increase in the liquidity of the provincial government bond markets increases provincial borrowing costs, which contrasts with a priori expectations. Apparently, the sum of the gross new debt issues in the previous four quarters in percentage of the total of all provincial issues may not be a very good way of measuring liquidity.

Table 6: The non-linear model for Canada: 1992Q3-1997Q4

Explanatory variables	(1)	(2)	(3)	(4)
Constant	20.82 [10.25]**	77.85 [8.38]**		
Alberta			30.32 [5.19]**	42.98 [5.88]**
British Columbia			-3.16 [6.35]	15.34 [7.44]**
Manitoba			28.42 [16.68]*	60.86 [16.11]**
New Brunswick			-9.76 [14.01]	23.63 [15.00]
Newfoundland			-11.01 [13.50]	23.28 [15.51]
Nova Scotia			1.25 [12.04]	30.21 [15.10]**
Prince Edward Island			-5.78 [5.79]	25.24 [9.10]**
Quebec			39.72 [6.27]**	64.02 [13.64]**
Saskatchewan			13.80 [12.42]	40.45 [14.91]**
$FISC_i$	-14.13 [2.90]**	-8.50 [2.50]**	-35.39 [2.74]**	-22.95 [2.80]**
$DEBT_{i,t}$	0.75 [0.35]**	0.62 [0.33]*	1.22 [0.17]**	1.95 [0.32]**
$DEBT_{i,t}^2$	-0.006 [0.002]**	-0.004 [0.002]**	-0.01 [0.002]**	-0.01 [0.002]**
$APPETITE_{i,t}$		-0.41 [0.04]**		-0.32 [0.04]**

Germany

The German Federal System

Germany is a federal state that consists of 16 Länder (states and city states): Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Phalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein and Thüringen. The federal system of Germany represents a strong commitment to federation, primarily because of provisions in the Basic Law of 1969 (OECD, 1997). The Basic Law exerts significant control over the budgetary policies of the Länder, through a Financial Planning Council that attempts to co-ordinate overall fiscal policy. The Financial Planning Council is chaired by the Federal Minister of Finance and consists of the Länder Ministers of Finance, the Minister of Economics, and representatives of the municipalities and the Bundesbank. The Financial Planning Council makes recommendations on the co-ordination of budgets and financial plans of the Bund (federation) and the Länder, although it cannot make any binding decisions. A major factor in negotiations between the Bund and the Länder is that the negotiating partners are unequal. On one side is the Bund and on the other the 16 Länder, a majority of which must agree on a solution. It is therefor usually easier for the Länder to get their way. The Basic Law, provides also that there must be   reasonable equalisation between the financial weaker and stronger Länder, taking into consideration the financial capacities and financial requirements of the municipalities or associations of municipalities.[13] This is ensured by the distribution of tax revenues and by a system of supplementary allocation.

Some 72 per cent of Land revenues are made up of Land taxes, such as capital tax, inheritance tax, and so-called joint taxes (whose revenue are shared by the Federation and the Länder, and sometimes also by the municipalities), such as turnover tax, corporation tax and income tax. The Land taxes account for approximately 13.5 per cent of Land revenue, income and corporation tax for approximately 53 per cent and turnover tax for some 27 per cent. Together they account for about 75% of all tax revenues (OECD, 1997). Transfers account for another considerable share of Land revenues. Within the framework of co-operative federalism, the Bund funds investments made by the Länder or the local authorities. But by doing so, the Bund can exert considerable influence on Länder and municipality policy. In the case of joint tasks, the Bund and the Länder share the financial burden equally.

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[13] As from 1995 the eastern Länder have been fully tied into the federal equalisation system.

Credit implications: Germany

The Länder can borrow, and the Federal Government is not liable for their debts. However, the unique structure of the federal system provides the Länder with a level of credit safety very close to that of the federal government. The fiscal relationship between the federal government and the Länder is so tight that markets forces scarcely distinguish between the Länder. Differences in the Länder" borrowing terms in the domestic market are determined more by liquidity than by creditworthiness considerations.

Table 7 presents average yield differentials of the German Länder with the Bund (in basis points). The average yield differentials are very small. Liquidity risk considerations in stead of credit risk considerations are the main explanation for yield differentials. Länder governments have few bonds outstanding and seldom issue new bonds.

Table 7: German Länder average yield differential with Bund (in basis points)

	Baden-Württemberg	Bayern	Berlin	Brandenburg
	10-year	10-year	10-year	10-year
1993	33	20	24	21
1994	27	26	24	26
1995	22	23	24	25
1996	12	16	22	22
1997	14	8	12	14
	Bremen	Hamburg	Hessen	Mecklenburg-Vorpommern
1993	19	17	21	23
1994	27	19	34	29
1995	25	23	29	23
1996	20	23	32	24
1997	13	16	22	20
	Niedersachsen	Nordrhein-Westfalen	Rheinland-Phalz	Saarland
1993	8	18	15	-
1994	25	33	17	25
1995	22	27	23	24
1996	14	18	15	21
1997	6	15	18	12
	Sachsen	Sachsen-Anhalt	Schleswig-Holstein	Thüringen
1993	22	34	23	24
1994	16	25	13	48
1995	19	26	21	30
1996	21	28	22	22
1997	21	14	21	7

Source: Own calculations with monthly data obtained from Datastream. See also Appendix D.

Table 8 presents pooled and fixed-effects regressions of the non-linear model for Germany, based on annual data. Nordrhein-Westfalen is taken as the reference-state in regressions (3) and (4). The estimations have to be interpreted with care because of the limited number of data (annual frequency). The results in regression (2) of Table 8 indicate that one unit increase in the appetite for credit risk in world financial markets lowers the Länder borrowing costs by 0.15 basis points. Borrowing costs increase by 0.89 basis points for every percentage point increase in Länder debt-to-GDP and decreases by 0.015 basis points for every percentage point increase in squared debt-to-GDP (regression (2)). This means that there is no credit rationing taking place in all regressions. Notably, a percentage point increase in the relative amount of gross new debt issues lowers borrowing costs of the Länder with 0.19 basis points in regression (2) and 0.42 basis points in regression (4).

Table 8: The non-linear model for Germany: 1994-1996

Explanatory variables	(1)	(2)	(3)	(4)
Constant	16.17 [5.91]**	37.04 [7.06]**		
Baden-Wuerttemberg			-2.05 [5.86]	12.69 [2.13]**
Bayern			2.78 [4.96]	21.06 [4.74]**
Berlin			-0.05 [4.30]	-2.77 [2.53]
Brandenburg			0.003 [3.93]	-2.48 [1.78]
Bremen			28.25 [16.31]*	3.43 [9.16]
Hamburg			-3.78 [4.63]	4.60 [1.68]**
Hessen			7.64 [3.42]**	17 22 [3.36]**
Mecklenburg - Vorpommern			0.32 [3.13]	1.23 [0.82]
Niedersachsen			-5.62 [5.15]	10.70 [12.38]
Rheinland-Phalz			-6.37 [4.42]	-2.59 [2.53]**
Saarland			13.57 [10.78]	-0.59 [2.49]
Sachsen			-5.61 [4.11]	7.35 [3.78]*
Sachsen-Anhalt			2.95 [4.42]	-3.59 [5.61]
Schlewig-Holstein			7.39 [4.06]*	7.22 [6.09]
Thueringen			6.63 [8.60]	-4.08 [5.31]
$DEBT_{i,t}$	0.56 [0.45]	0.89 [0.37]**	2.42 [0.45]**	3.65 [0.40]**
$DEBT_{i,t}^2$	-0.001 [0.008]	-0.015 [0.006]**	-0.06 [0.02]**	-0.06 [0.01]**
$APPETITE_{i,t}$		-0.15 [0.04]**		-0.18 [0.04]**
$AIS_{i,t-1}$		-0.19 [0.06]**		-0.42 [0.26]
S.E. of Regression	6.44	4.38	5.86	3.68
$\overline{R}^2$	-0.01	0.43	0.16	0.60
N	48	32	48	32

Notes:

(1) $S_{i,t} = b_0 + b_1 DEBT_{i,t} + b_2 DEBT_{i,t}^2 + e_{i,t}$

$(2)\ S_{i,t} = b_0 + b_1\ DEBT_{i,t} + b_2\ DEBT^2_{i,t} + b_3\ APPETITE_{i,t} + b_4 AIS_{i,t-1} + e_{i,t}$

$(3)\ S_{i,t} = \sum_{i=1}^{n} a_i\ DUM_i + b_1\ DEBT_{i,t} + b_2\ DEBT^2_{i,t} + e_{i,t}$

$(4)\ S_{i,t} = \sum_{i=1}^{n} a_i\ DUM_i + b_1\ DEBT_{i,t} + b_2\ DEBT^2_{i,t} + b_3\ APPETITE_{i,t} + b_4 AIS_{i,t-1} + e_{i,t}$

[*] Significantly different from zero at 95 per cent level of confidence (one-sided test)
[**] Significantly different from zero at 99 per cent level of confidence (one-sided test)

White heteroskedasticity-consistent standard errors are between brackets.

Source: See Appendix D.

4. An incentive-based framework of fiscal discipline

The results in the previous section indicate that rules and markets only tend to bite during periods when there is a low appetite for credit risk in world financial markets. Therefore, I propose an alternative more incentive-based framework of fiscal discipline. Measures that act as an incentive for governments to improve their fiscal behaviour include:[14]

(1) The development of integrated government bond markets
At present national provisions regulate the public offering, marketing and distribution of government debt.[16] Banks that provide investment services must be subject to authorisation by their home country. This discourages issuers and their intermediaries from placing bonds on a cross-border basis, and therefore prevents investors from diversifying their portfolios. The Euro will highlight the existence of these regulatory barriers. The underlying dynamics of the liquidity and default risk situation in government bond markets will be essential for the geographical diversification of government bonds. Lowering transaction and administration costs, harmonising trading rules, market conventions and selling techniques (auctions, syndication) will increase the potential for diversification of government securities. Cross-border acceptability of prospectuses, listings, financial reporting, rules applying to investment service providers could help to decrease the home bias in government bond markets (see also the CEPS report by Lannoo and Gros, 1998).

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[14] Part of these incentive measures are adapted from reports by the World Bank on Brazil (1995) and Argentina (1996a,b), the IMF=s Code on Good Practices on Fiscal Transparency - Declaration on Principles (16 April 1998) and the IMF=s Draft Manual on Fiscal Transparency (19 October 1998) and a report by the CEPS Working Party on Capital Markets and EMU by Karel Lannoo and Daniel Gros.

[15] There is the tendency of investors to overweight their portfolio with greater than expected allocations of *domestic* financial assets. Foreign assets are under weighted because of (1) the higher barriers and costs of foreign investment such as transaction costs, taxes, capital controls, market access, time zone differences, language barriers, administrative costs and so forth and (2) the higher risks of foreign investments such as political risks.

[16] The international federation of securities regulators (IOSCO) has agreed on a set of standards for cross-border offerings of securities.

Inviting more foreign participation increases the cross-border placing of government bonds and would promote the diversification of government bond portfolios. With widely held bond portfolios the systemic risks of a fiscal crisis would be less severe, and the bailout pressures on the ECB or other EMU governments less strong (Arnold and Lemmen, 1999).

Recently, more attention has been focused on accounting and disclosure diversity to determine whether it is a significant barrier to international investment and whether public policy reforms are advisable (European Commission, 1998a). The International Accounting Standards (IAS) Committee has developed a set of global accounting standards. A common accounting system for all levels of government of EMU member states, with independent external auditing assigned to a private firm of accountants whose results are made public should be set up. The IMF has also set up a "Special Data Dissemination Standard" which provides standards for participating countries in disseminating economic and financial statistics.

(2) Regulating borrowing from the private sector
Commercial banks have often lend more to (lower levels of) governments than would be justified by the governments' own financial condition, in the belief that the debt carried an implicit or explicit government guarantee. Banks often hold government bonds at below-market interest rates, undermining the profitability of banks (Arnold, 1999).

The ECB (1999) calculates (see Table 9) that the relative importance of banking sector=s direct lending to governments in terms of total domestic assets decreased over the period 1995 to 1997 in most EU countries due to the Stability and Growth Pact (1996). Arnold and Lemmen (1999) however argue that the risks of existing large exposures of *individual* banks to public debt in several European countries remain high. The authors examine the sensitivity of a banks' position in public debt to government default shock and conclude that regulators should promote the geographical diversification of public debt held by banks since it would reduce the risks of bank failures following a fiscal crisis in the EMU.

Regulators should apply the *large exposure rule* and *the capital adequacy directive* to public debt (Bishop, Damrau and Miller, 1989, Arnold and Lemmen, 1999). At present, the large exposure rule that states that a bank cannot lend more than 25 per cent of its capital to a single borrower does not apply to government debt. Banks and other financial institutions should disclose their credit exposure to all levels of government.

Table 9: Banks' domestic claims on the government sector (as percentage of banks' total domestic assets)

	1992	1995	1996	1997
Belgium	26.12	26.18	24.5	22.85
Greece	24.34	25.54	22.1	n.a.
Spain	14.61	17.75	18.28	15.91
Italy	12.98	16.91	17.38	15.83
Germany	12.42	14.61	13.85	13.27
The Netherlands	11.4	10.96	10.17	8.88
Portugal	19.73	15.1	12.72	8.39
France	2.74	5.5	6.76	6.78
Denmark	12.25	11.4	8.62	6.45
Sweden	6.59	14.52	6.64	4.86
Finland	3.21	10.48	n.a.	n.a.
Ireland	n.a.	7.89	6.39	2.77
United Kingdom	1.47	2.12	1.81	1.28
Luxemburg	n.a.	0.21	0.2	n.a.

Note: n.a. non available.

Source: ECB (1999, Table 2.13a).

In addition, the zero risk-weighting of bank lending to OECD governments in the current Basle capital adequacy standards is no longer appropriate.[17] This would improve the incentives of the banking system to avoid risky loans to the more exposed governments. The problem with this proposal is that non-zero risk weighting would increase banks' capital needs, possibly lowering the banks' demand for public debt and depress government bond prices.

(3) Prohibit governments from being shareholder of commercial banks and companies
Governments often acquire equity in companies or commercial banks. Regulation should prohibit governments from having their own banks or companies. Such "government-owned" banks and companies have access to cheaper funding than comparable privately owned banks and companies because of the implicit or explicit government backing. Government-owned banks are encouraged to undertake more risky projects and tend to lend out a larger share of their assets to local, provincial and central governments than commercial banks (Arnold, 1999).

(4) Harmonisation of differences in tax
Differences in tax influence investor's demand for public debt. Governments may want to establish tax incentives to the nonfinancial sector (households and corporations) both located at home (resident interest withholding taxes) and abroad (non-resident interest withholding taxes) to lower the exposure to the domestic financial sector, but this would presumably run foul of desires for EU tax harmonisation. Indeed, a major problem is whether, and how long, existing tax breaks for

nationals investing in own-country government bonds can continue, and what would be the fall-out if such discriminating tax advantages were required to be (progressively) removed. These tax breaks are probably not large enough to account fully for the extent of the home country bias in government bond markets.

(5) Internal government reform

The above four incentive measures are not a sufficient condition for the prevention of fiscal crises. Investors face the risk that a government may not have the revenue and expenditure flexibility to respond to changes in the external environment, or that the government will choose not to, even if it has the ability to pay debt service. Every new administration starts with a new agenda, which often includes reneging on the commitments of its predecessors. The uncertain path for taxes and expenditures affects the government borrowing needs and thus its exposure to variations in interest rates. Internal control systems in governments should be adapted to increase governments= ability and willingness to pay debt service. Governments should implement modern risk-management techniques. Government should conduct projections of expenditures including a breakdown between capital and current spending and revenues, a breakdown of types of revenues and whether they are shared with other levels of government. In addition, predictions of the level and variability of cash flows to pay off debt service should be made. EMU governments should reduce their debt to levels that would be payable through the entire range of interest rate changes, government default shocks and output reductions that can be expected.

For example, take the case of Brazil. Government default would have severe consequences for the Brazilian banking system. The Brazilian government owes R$320 billion domestic debt to Brazilian banks and other financial institutions. Holdings of government paper amount to between 20 and 30 percent of the banking system=s assets. The recent currency depreciation vis-à-vis the US dollar has increased the stock of the debt with R$60 billion. About half of the debt falls due this year. Already there are doubts about whether investors will agree to roll it over. Some government creditors could ultimately conclude that the interest rates - no matter how high - would not compensate for the risk of holding government paper. Even a 10% fall in the value of the paper would be enough to wipe out the entire financial sector=s profits of last year (Financial Times, February 5, 1999, p. 16).

5. Conclusion

This paper relates the experience of three federal states (Australia, Canada, Germany) with rule- and market-based fiscal discipline to issues involving EMU. Given the nearly exclusive reliance of most

studies on US data, I wonder if the US evidence necessarily holds true for other federal states. The paper analysed by how much (in terms of basis points) state/provincial borrowing costs increase for every percentage point in additional debt or debt squared (market-based fiscal discipline) and/or by how much state/provincial borrowing costs decrease with more stringent budget rules (rule-based fiscal discipline).

Yield differentials for Australian states and Canadian provinces have at times exceeded 100 basis points, but are found to be small for the German Länder. These larger yield differentials are probably due to the relatively larger cross-sectional variation of credit risk premiums in Australia and Canada than in Germany. The measure for liquidity (the relative amount of gross new domestic debt issues) did not always point in the same direction. I could not find a systematic negative relation between issue size and yield differentials for the Canadian provinces. My measure for liquidity - the sum of the gross new debt issues in the previous four quarters in percentage of the total of all provincial issues - may not be a very good way of measuring liquidity. Fortunately, for Germany I am able to provide evidence that a higher liquidity reduces borrowing costs of the Länder.

My main finding, however, is that the world's appetite for credit risk is a key determinant of provincial-federal yield differentials. High provincial-federal yield differentials reflect a low world appetite for credit risk. Rules and markets only tend to bite during periods when there is a low appetite for credit risk in world financial markets. Particularly since the Russian default of August 1998, the world's appetite for credit risk is the driving force behind yield differentials of provincial governments vis-à-vis the federal government. Future developments in Brazil or Japan are more likely to influence provincial-federal yield differentials than domestic factors such as provincial debt-to-GDP ratios or fiscal rules. Even so, this does not mean that state-specific (political) can be safely disregarded. The case of Québec shows that state-specific political risks may independently explain an important part of provincial-federal yield differentials.

Finally, this paper proposes an alternative more incentive-based framework of fiscal discipline. This incentive-based framework should increase the sensitivity of government borrowing costs with respect to debt levels, increase the geographical diversification of investor's portfolios with respect to government bonds, and prevent government financing from fuelling private or public sector bailout expectations. The overall result is likely to be a strengthening of market discipline and a reduction in the aggregate level of public debt in the financial system.

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