

Fiscal Federalism and Procyclical Spending: The Cases of Argentina and Brazil¹

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First Version: June 2004

This Version: August 2006

I. Introduction

It is well known that government consumption in emerging countries is typically procyclical and Latin America is no exception to this trend. Figure 1 shows the correlation between the cyclical component of government expenditure and GDP² which is, in general, positive. The contrast between developing and emerging countries with that of OECD countries (indicated by a darker bar) for which procyclicality is much smaller, is particularly striking.

The fact that government spending is procyclical precludes the stabilizing role that fiscal policy should play in macroeconomic management. Even though neoclassical tax smoothing, Keynesian or new growth theory would all argue on the benefits of a countercyclical fiscal result for many countries the procyclicality of fiscal expenditures is so strong that it implies that *fiscal results* actually deteriorate with expansions. Notice that this requires fiscal expenditure to grow above and beyond the natural increase in tax revenues during an expansion (and to fall even more than revenues during a contraction). Figure 2 shows the procyclicality of fiscal results, by showing the correlation over the last thirty years in fiscal results and the cyclical component of GDP³. Again, the fact that fiscal results deteriorate when economic conditions improve seems to be an almost exclusive feature of developing and emerging economies, whereas OECD countries show the expected procyclical result.

While this has obvious implications in terms of macroeconomic stabilization it also may have a detrimental effect on growth. There is an ample literature suggesting that more economic instability is associated to slower growth,⁴ thus, the procyclicality of government expenditure and fiscal results not only worsens the cyclical behavior of the economy but also hurts its growth potential. More recently Aghion and Marinescu (2006) have made the point that a

¹ We thank Daniel Artana, Cynthia Moskovits, Fernando Navajas, Andy Neumeyer, Alberto Porto, Rodrigo Suescun and Abel Viglione for valuable comments. Sofia Zerbarini, Victoria Vanasco and Federico Dorso provided able research assistance. This paper was written for the World Bank. The comments expressed here reflect the views of the authors and not those of the World Bank.

² The measure is central government expenditure from WEO. In both cases the cyclical component is defined as deviations from a HP trend. The first version of the figure is taken from Kaminsky, Reinhart and Vegh (2004).

³ Data corresponds to fiscal results in the IFS, correlated with the HP deviation of real GDP.

⁴ See for example Ramey and Ramey (1995).

countercyclical fiscal policy is essential for growth because R&D expenditures are the first to be cut in a recession.⁵

While there is an extensive literature on the procyclicality of fiscal policy at large, including its effect on macro stabilization and growth, one aspect that has been relatively less studied is the connection between so called “vertical imbalances” in fiscal policy across different levels of government⁶ and its effect on the overall procyclicality of fiscal policies.

The conventional wisdom story goes something like this: because subnational authorities are subject to some degree of vertical fiscal imbalance (they spend resources collected by the national authority), they have little incentives to collect taxes (both national and local), have an incentive to increase spending above socially optimal levels, to run high and unsustainable deficits and to have an excessively procyclical fiscal behavior. At an anecdotal level, this view seems to be confirmed. In the cases of Brazil and Argentina, to take two countries that constitute the focus of this work, there are several examples of how subnational governments worsened the overall fiscal picture. In Brazil, the default of the state of Minas Gerais in early 1999 prompted the sharp devaluation of the real, and in Argentina, the fiscal behavior of the provinces were a key ingredient in the process of fiscal deterioration that led to the crisis in late 2001 that forced the collapse of Convertibility. This conventional wisdom has been the basis on which international financial institutions have supported their demands for clearer and more precise fiscal rules governing the relationship between the different levels of government, as well as in stressing the need to reduce the degree of vertical imbalances.

This paper attempts to provide a fresh look at the conceptual issues and the evidence governing the relationship between procyclicality and fiscal federalism. In Section II we discuss the reasons why government spending is procyclical and why these effects may get compounded when taking into account the existence of subnational units. Section III, describes the specific relation between different levels of governments for the cases of Argentina and Brazil. As there are ample references describing fiscal institutions in both countries we present only a barebones sketch here. Both these sections can be skipped by readers familiar with the literature and with the cases of Argentina and Brazil. Section IV, the core of the paper, provides evidence on the procyclicality of fiscal policy in Argentina and Brazil. We explore both a time series as well as a cross section dimension (how procyclicality changes across jurisdictions) at the local level. The richness of a cross section allows to test for the sources of procyclicality by exploiting the information contained in the different observed levels of procyclicality observed across subnational jurisdictions. We argue that procyclicality is mostly related to the nature of the local tax base of subnational jurisdictions rather than related to fiscal federalism. Section V concludes by arguing that the focus on changing fiscal sharing rules has been misguided. The attention should be placed in developing better financial institutions that may allow for smoothing of fiscal variables across the business cycle with the resources collected by each jurisdiction, as well as potentially designing less procyclical revenue sources.

II. Why is spending procyclical?

Traditional macroeconomic theory suggests that fiscal results should be countercyclical. On the one hand neoclassical theory argues that spending and tax rates should be determined on the

⁵ See Frankel, Smit and Sturzenegger (2006) for an application to South Africa.

⁶ Vertical imbalance refers to the fact that the financing of expenditures at a given level of government is not done with resources collected by that jurisdiction but by other jurisdiction that transfers the resources to the other level of government.

basis of efficiency considerations, and therefore mostly unrelated to the business cycle. Furthermore, the theory shows that to minimize the distortions of taxation tax rates should be either maintained constant over time, or, if anything, reduced during a recession. This delivers the result that tax revenues should increase during expansions and fall during recessions. With a relatively stable expenditure policy, this implies that governments should run deficits in recessions and surpluses during an expansion.⁷ For different reasons, the Keynesian framework delivers the same recommendation. According to this view, fiscal policy should counteract business cycle fluctuations, increasing expenditures and reducing taxes during recessions. Again the government should run deficits during recessions and surpluses during booms.

More recently Aghion and Marinescu (2006) have argued that procyclical fiscal policy has detrimental effects on growth because firms curtail R&D expenditures during recessions. Thus, exacerbating the business cycle with fiscal policy reduces the level of R&D investment and reduces growth.

The evidence suggests that developed economies mostly fit the recommendations of theoretical models.⁸ Figures 1 and 2 provided some cursory evidence. Talvi and Vegh (2000) also show that tax collection increases during an expansion and fall during recessions, and that government spending is countercyclical in G-7 countries and while procyclical, less so than tax revenues, for other industrialized countries. Gavin *et al* (1996) show that fiscal surpluses are procyclical in OECD countries, also confirming these countries fit the theory. Arreaza *et al* (1999) finds a similar result.

The pattern, however, does not fit emerging countries at large and Latin America in particular. In Latin American countries tax collection is strongly procyclical, but this comes together with extremely procyclical government expenditure, thus rendering budget results that either show no relation with the budget cycle as shown in Gavin *et al*(1996) or Talvi and Vegh (2000) or are countercyclical as shown in Figure 2.

There are several explanations why fiscal expenditure may be so procyclical. Gavin *et al* (1996) suggest that the procyclicality arises from limited access to capital markets during downturns, thus forcing the government to contract expenditures when it needs them most. This interpretation seems to find some support in the fact that spending appears to be much more procyclical during recessions than during booms.

While there is ample evidence on the procyclicality of capital flows⁹, the capital market channel does not require that governments be totally cut off from capital markets. Assume two types of government: a defaulting type and a non defaulting type, and assume also that investors do not know the type of the government in power. When conditions in capital market tighten, a government that is the non-defaulting type is hard pressed to show to the investor community its commitment to fulfill its obligations. Thus, it follows excessively contractionary policies to signal its type at a time in which they most need to be expansionary.¹⁰

Alternatively, Talvi and Vegh (2000) argue that fiscal policies are procyclical because weak governments cannot face the political pressures to increase spending when in a boom, i.e. when tax collection is on the rise or the economy benefits from an improvement in its terms of trade. Therefore, governments increase expenditures and reduce taxation in order to fend off such

⁷ See Barro (1979).

⁸ See for example Gavin *et al* (1996), Lane (2003), Hercowitz and Strawczynski (1999) and Talvi and Vegh (2000).

⁹ See Kaminsky, Reinhart and Vegh (2004) and Levy-Yeyati (2006).

¹⁰ We thank Andres Neumeier for suggesting this interpretation to us.

pressure, which delivers the result that both tax and expenditure policies become procyclical. The strong increase in fiscal demands during expansions can be rationalized by the so called “voracity effect” proposed by Lane and Tornell. According to their interpretation, if a group does not increase its appropriation during a boom, other groups will. Lane and Tornell show that there is a strong incentive to grab part of the newly available resources before other groups do, and that the incentives to do so increase with the size of the pie; thus, this common pool problem becomes stronger in an expansion delivering the procyclical result.

Cukierman, Edwards and Tabellini (1992) place the responsibility of procyclicality in the equilibrium resulting in a political game between politically opposed governments. According to them a government may run up debt levels (if capital flows are procyclical this financing is available during booms) in order to constraint the spending policies of future governments (the Reagan tax cut, for example, can be interpreted as a way to condition the spending ability of future governments). If so, countries may build up debt during boom periods, thus generating a procyclical fiscal policy.

How does fiscal federalism affect the procyclicality of government expenditures? To explore this we can go back to the explanations of procyclicality and see how they apply to subnational institutions. For example, the credit crunch hypothesis implies that subnational governments should be more procyclical than that of the national government under the (reasonable) assumption that their access to credit becomes even more difficult under credit constraint circumstances¹¹. However, this story cuts both ways: if a subnational government has very limited amount of debt because it never had *any* access to financing, domestic or international, then they should exhibit a lower degree of procyclicality than the national government. Below we will test this by looking at the effect of provincial indebtedness on procyclicality.

The fiscal voracity effect is probably at work also in the case of subnational governments, usually suspected of being subject to a higher degree of cronyism and corruption than the national government, this effect can be related to the procyclicality of provincial taxes (more volatility more procyclicality). We test below if the procyclicality of government spending relates to that of provincial income.

How does the existence of bailouts and discretionary transfers affect the procyclicality of fiscal policy at the national and subnational level? If discretionary transfers operate as an insurance mechanism over the business cycle, then these transfers will reduce the procyclicality of subnational government resources. Nicolini et al (2000) provide evidence that to some extent this is the case and the recent restructuring of provincial debt in Argentina, after the 2001 crisis is another example. However, if transfers are also subject to typical fiscal voracity effects, this time with subnational governments themselves preying the pool of national resources, their existence will exacerbate the procyclicality of expenditures. How could we test for this channel? To the extent that bailouts are usually related either to strong political links and that it is more costly to allow larger jurisdictions to fail, we can test the relevance of this explanation by relating the degree of procyclicality to the size of the jurisdiction (larger size should imply more procyclicality) as well as to the links between the governors and the national power (with stronger links potentially correlated with more procyclicality). If it is possible to free ride on the opening of capital markets for the national government, then subnational units will try to appropriate resources from the federal government when this financing is available. Thus

¹¹ Gonzalez, Rosenblatt and Webb (2002) notice that, in Argentina, “even the better performing provinces consistently faced higher interest rates than the federal government.” Something similar could be said about well-run states in Brazil.

periods with access to capital markets should show an increase in the procyclicality through this channel.

III. Fiscal Federalism specificities: Argentina and Brazil

There are many extensive descriptions of the specific fiscal federalism arrangements in Argentina and in Brazil.¹² Thus we provide the minimum sketches here and relate the reader to more detailed and comprehensive assessments.

*Argentina*¹³

Argentina is a federal republic with a presidential government and a bicameral legislature. In the Chamber of Deputies, representatives for 24 provinces are chosen in closed party lists. While the Chamber supposedly elects deputies in proportion to their populations, the Argentine system over-represents the participation of small provinces through a minimum number of five deputies per jurisdiction. The Senate is represented by three senators each, two from the first majority and a third from the second party. Provincial governments have ample powers to decide their own rules of governance as well as taxing and spending decisions, while municipalities report to the provincial governments. Tommasi (2002) argues that this system, where municipalities and deputies of each jurisdiction respond to the provincial executive, makes governors key players in the political equilibrium.

Although the Argentine Constitution establishes substantial room for subnational taxation, in practice provinces have delegated to the national government the responsibility of raising a large share of their taxes. This revenue concentration contrasts with a spending decentralization process whereby the responsibility for key social functions is in provincial hands. For example, provinces have exclusive competence in primary and secondary education and in the provision of local public goods (most social expenditures in education, health, poverty programs, and housing).

Given expenditure decentralization and tax centralization, a high degree of vertical fiscal imbalance did result. In 2000, for example, 56 percent of total resources received by the provinces came from nationally collected taxes, while only 44 percent was financed directly by provincial revenues. Fifteen of the 24 provinces finance less than 30 percent of their spending with their own resources.

Argentina addresses this large vertical fiscal imbalance through a complex system of intergovernmental transfers. The most important component of this system is the tax-sharing agreement called “*Coparticipación*”, which refers to the process by which part of the taxes collected by the central government are reallocated to the provinces. Over time, the system has tended to redistribute in favor of the most backward and low-density provinces.

The last Coparticipation Law, sanctioned in 1988, established a set of sharing rules. According to this law, the Federal government would retain 42 percent of the revenue from the shared taxes, while 57 percent would be distributed among the provinces, with 1 percent set aside “to finance unforeseen crises in the provinces”. The law also sets the percentages of “secondary”

¹² See for example, Nuñez Miñana (1998), Fiel (2003), CEDI (1999) Gomez Sabaini and Gaggero (1997), Iaryczower et al (2002), Jones et al (1999), Tomasi et al (2001), Piffano (1998) and Porto (2004) for Argentina and Ter-Minassian, T. (1997b) and Afonso and Mello (2000) for Brazil.

¹³ This section draws heavily from section I.2 of Tommasi (2002).

distribution, i.e., the share of the 57 percent going to each province. It is important to stress that this law stipulates most of the transfers, thus reducing dramatically the scope for discretionary policies and redistribution.

Unfortunately, several other laws regulating the distribution of specific taxes to finance predetermined activities have supplemented the basic Coparticipation Law. These include a series of “fiscal pacts”. For example, in 1992-1993 the national government was able to obtain a 15 percent reduction in the amount of tax resources to be shared with the provinces, in exchange for financing the deficits in the local pension systems which were transferred to the national budget.

According to Cetrangolo and Jimenez (2003), during the nineties, as the economy recovered and tax collection increased different schemes were pursued by both provinces and the federal government in order to appropriate a larger share of these resources. For example, while VAT and income taxes increased 152 percent between 1991 and 1995, the federal government managed to keep coparticipation transfers constant while direct transfers increased by 122 percent.

These various reforms introduced new types of transfers besides Coparticipation per se. Additionally, a variety of specific channels earmarked the resources from some taxes to specific, often economically unrelated, spending. This all came to be known as the “Fiscal labyrinth” due to the intricacies and complexity of the resulting system. Needless to say, in some cases the direct transfers appeared to be determined by political considerations. Cetrangolo and Jimenez (2003), for example, show the distribution of discretionary funds between 1989 and 2001, favored politically protected provinces. For example the province of La Rioja, from where the President at the time had built his political career, received 26.5% of all transfers the province, with the closest province receiving less than 6%.

The 1994 Constitutional reform stipulated that a new tax revenue-sharing agreement had to be decided and put in place by January 1st, 1997. However, this constitutional mandate remains unfulfilled. As a result new fiscal pacts were signed in 1999 and 2000. In these pacts the national government promised to the provinces some fixed-sum transfers and some minimum revenue guarantees, assuming the role of residual claimant. These clauses were violated by the national government during the 2001 crisis, when faltering tax revenues did not allow the government even to fulfill the minimum guarantee.

Further fiscal pacts were signed after exiting convertibility, and included a freeing from the fixed transfer amount, an obligation for the federal government to coparticipate the financial transactions tax, debt restructuring, and, yet, again, a pledge from provinces to balance the budget.

Within Argentina’s federal structure all levels of government are generally permitted to borrow both domestically and abroad. However, in many provinces, the provincial Constitution imposes some restrictions on the borrowing ability of the government. In some jurisdictions these restrictions are quite demanding, and in some cases there are restrictions on the level of indebtedness and on the uses of debt.¹⁴ Nevertheless, more often than not these restrictions are violated, and in many provinces they are too loose to be binding (Braun and Tommasi, 2002). It

¹⁴ Cetrangolo and Jiménez (2003) provide a careful review of subnational fiscal rules.

is therefore not surprising then to find that borrowing limits have little effect on the fiscal behavior of provinces (Jones, Sanguinetti and Tommasi 1999).¹⁵

Provincial debt placements are subject to ex ante federal government controls, but seldom have the central government aborted a provincial issue. (Dillinger and Webb, 1999). In recent years the main borrowing control mechanism centered on the arrangements that the provinces made to collateralize their debt, by pledging *coparticipación* resources as collateral. As tax sharing proceeds are distributed by the Banco de la Nación, provinces with a weak credit position grant an irrevocable order for Banco de la Nación to deduct the debt-service payments up-front from their *coparticipación* resources. To get an idea of the extent to which this mechanism was used, it is worth noting that the percentage of tax revenues withheld for this purpose in 2000 ran from 2 percent in Buenos Aires and La Pampa, to 85 percent in Tucumán, 92 percent in Jujuy, and 97 percent in Rio Negro.

During 2001 and 2002, there was a large increase in the emission of provincial bonds in the form of quasi-money, to pay wages and other inputs with the stock quickly increasing to about a third of monetary base at the time. This operation was started by several provinces, most notably Buenos Aires, and it was followed by a similar attempt of the national government who, in order to comply with the requirements of the various fiscal pacts started issuing a “federal” bond (LECOP) of national circulation. Because it was used as money, it had a direct impact on the demand for pesos fuelling the run on the peso that eventually led to the collapse of convertibility.

Brazil

Brazil has an extremely complex federation. The three government levels comprise the Union, 26 states plus the Federal District, and more than 5500 municipalities. The Constitution explicitly considers municipalities to be members of the federation, giving them a much higher status than is generally observed in other federative countries.

The republic has a presidential regime and a bicameral legislature. Each state is equally represented in the upper chamber by three senators. Representation in the Chamber of Deputies is not strictly proportional to state constituencies, as the Constitution establishes that no state may have less than 8 deputies and more than 70. A constraint that basically leads to an over-representation of the unpopulated Northern states and a marked under-representation of the state of São Paulo.

The fiscal federalism arrangement has undergone great changes over the country’s history. There has been alternating phases of decentralization and recentralization. During most of the 19th Century, when the country had a parliamentary monarchy, a high degree of centralization prevailed. The Proclamation of Republic, in 1889, would bring extensive devolution of taxes

¹⁵ One way in which these limits became non-binding was through the use of provincial state banks that in most provinces were politically dependent on the provincial executive power, and, in practice, acted as captive sources of financing for subnational governments. Given their portfolio of bad assets (resulting to a significant extent from lending to provincial governments) many provincial banks were privatized in the aftermath of the 1995 Tequila crisis that had induced a run against, mainly, provincial financial institutions. However, some provincial banks were kept in government hands. Not surprisingly, the bank run of 2001 was again strongly fuelled by a run on the largest two public banks: the Banco de la Nación and the Banco Provincia that once again obtained large bailouts from the national government.

and spending to the states. But the central government was strengthened again during the authoritarian Vargas regime, in the 1930-1945 period. Re-democratization brought a new decentralization wave, which would be reversed yet again from 1964 on, this time by 20 years of military government. The end of the military regime in 1985 opened room for still another diastolic movement. The interests of subnational governments dominated the redesign of the fiscal federalism arrangement established by the 1988 Constitution.

Though the Constitution was very unclear in the assignment of expenditures to the three government levels, leaving ample room for concurrent responsibilities, it was quite clear in what concerns revenue assignment. Subnational governments, municipalities in particular, were directly or indirectly given a much more generous share of the aggregate taxes collected in the country. Though states and municipalities had their taxing power enhanced, much of the redistribution involved intergovernmental transfers based on clear cut revenue-sharing rules established in the constitution.

Drafted without minimum consistency guidelines, that a politically crippled executive branch was unable to defend, the new constitution failed to endow the public sector with a coherent mechanism to protect the interests of the majority of the population against the multiple pressures of an emerging mass democracy. Instead, it amplified the scope for the historical widespread rent-seeking behavior of many segments of the Brazilian society, imposing upon the federal budget a considerable additional burden, exactly when the Union's fiscal resources were being reduced in favor of state and local governments, in the wake of a newly introduced but basically inconsistent fiscal federalism.

As the new tax system designed in 1988 was phased in during the early nineties, the central government faced growing financial difficulties. But it soon started an unrelenting reaction to avoid the scissors movement of shrinking revenues and swelling expenditures that had been imposed on the Union by new Constitution. As expected, increasing revenues proved to be much easier than cutting back expenditures, especially when a large part of the federal spending could not be reduced unless politically costly constitutional amendments were approved by Congress.

Actually, the Union's consistent effort to increase its tax revenue – in order to recover what had been lost to state and local governments, to be able to properly finance its much enlarged spending responsibilities as well as to attain a sizable fiscal-adjustment effort – would prove to be a tremendous success, were it not for a big problem. As the central government devised every kind of exotic taxation scheme that could raise revenues and that would not be shared with lower-level governments, this required introducing very low-quality taxes. Most often that meant various forms of cascading turnover taxes, that seemed to have been definitely eliminated from the Brazilian tax system since the mid sixties.

Brazil has a gross tax burden of more than 36 percent, unusually high for a developing country. In 2002, roughly 70 percent of the tax burden was imposed by the Union. As the states' own revenue corresponded to slightly more than 25 percent, municipalities were left with a share of less than 5 percent of the total tax collection. However, when constitutional transfers are taken into account, the distribution of the aggregate tax revenue across jurisdictions changes dramatically. After all constitutionally-mandated transfers were made in 2002, the Union ended up with only 60 percent of the aggregate tax proceeds. The states remained with roughly 25 percent, as constitutional transfers from the federal level were practically offset by their own transfers to municipalities. The great net beneficiary of the redistribution was the local-government level. As a result of constitutional transfers from federal and state governments,

municipalities could count on total revenue which was equivalent to almost 15 percent of the country's aggregate tax collection. In other words, local governments were able to have access to an amount of resources that roughly tripled their own revenue.¹⁶

Of course those aggregate shares conceal wide differences, at both the state and the local level. Although state-level governments as a whole are only being slightly benefited by constitutional transfers, individual states, the poorest ones in particular, have obtained a sizable net gain from the redistribution. One should also note that gains from transfers on the local-government level vary widely among the extensive spectrum of thousands of extremely differentiated municipalities. That spectrum includes at one end, the cities of São Paulo and Rio de Janeiro, and at the other, all sorts of very poor small towns, with no own revenue, completely dependent on intergovernmental transfers. Revenue-sharing rules of federal- and state-level taxes embody a high degree of discrimination in favor of needier subnational governments.

More than three fourths of all federal transfers to subnational governments are constitutionally-mandated transfers. Mostly stemming from the revenue-sharing of the income tax and the IPI (the tax on industrialized products), collected at the federal level. Transfers from states to municipalities are also dominated by sheer compliance to revenue-sharing rules. Particularly important are the rules governing the sharing of the ICMS, the state-level value-added tax, which is the highest yielding source of revenue in the country. Discretionary, politically motivated grants have become much less important than in the past.

The broad fiscal-adjustment effort that took place since the late nineties, in order to provide a sound basis for macroeconomic stability, required drastic changes in the fiscal-federalism arrangement, in order to impose hard budget constraints on subnational governments. The changes involved privatization of most banks owned by state governments and strict control on state borrowing. State debts were consolidated, transformed into debts to the Union and rescheduled for 20 to 30 years.¹⁷ Each state signed a separate agreement, in which its own revenue was offered in guarantee, and an explicit commitment to a detailed fiscal-adjustment program was made. The rescheduling created proper political conditions for the approval by Congress of the Fiscal Responsibility Law that set up the institutional framework of a new fiscal regime.

The new legislation imposed several important constraints on subnational governments. Payroll outlays were limited to 60 percent of the net current revenue, and debts were capped to a percentage of tax revenues, established by the Senate. Upon request of the Federal Executive Branch, limits can be altered, but only in special circumstances. Currently, the debt stock, as a proportion of the net current revenue, is limited to 200 percent, in the case of the states, and to 120 percent, in the case of municipalities. Multi-year budgets, including explicit macroeconomic assumptions and contrasting scenarios are required from all government levels. Budget limits have to be strictly respected. A fiscal crime legislation establishes penalties for mismanagement. Noncompliance exposes incumbent governors and mayors to fines, loss of office, legal prosecution and re-election ban. Election-year provisions forbid borrowing based on anticipation of future revenue, expenditure without proper funding, and a ban on new hiring for 180 days before the election date. Emergency cash transfers among different government levels and any refinancing of debts are rigidly prohibited. In order to assure greater transparency in management of public accounts, the law imposes detailed book-keeping requirements to all government levels.¹⁸ Approved in May 2000, the Fiscal Responsibility Law has proved to be an

¹⁶ See Secretaria da Receita Federal, *Carga Tributária do Brasil*, 2002, abril 2003.

¹⁷ For details, see Bevilaqua (2000)

¹⁸ For further details, see Goldfajn and Guardia (2003).

important advancement in the evolution towards a rules-based fiscal-policy, in a country with such a complex fiscal federalism arrangement as Brazil.¹⁹

IV. The evidence: procyclicality of spending of subnational governments in Argentina and Brazil

Having reviewed the conceptual discussion and the institutional background of our analysis, we now tackle the question of discussing how the degree of procyclicality of fiscal policy has been affected by the behavior of subnational governments in the cases of Argentina and Brazil.

a. Argentina

As discussed in Section II, economic theory recommends that fiscal policy be countercyclical, i.e. that government surpluses increase during expansions and decrease during contractions²⁰. In order to assess to what extent this has been the case we begin by looking at the aggregate fiscal results available for Argentina from a long run perspective. In order to do so we look at a very simple relationship,

$$\Delta Surplus_t = a + b g_t + e_t,$$

where the variable $\Delta Surplus$ represents the change in the overall fiscal balance (income minus expenditures) of the federal government between year t and $t-1$ in percentage points of GDP. The variable g_t represents the growth rate of the economy in year t . This simple relation cannot be interpreted as more than estimating the correlation between fiscal results and growth. Table 1, shows the results since the beginning of the 20th century.²¹

The results show, that there is very little relationship between fiscal balances and output and, somewhat surprisingly, the 90s show statistically significant evidence in favor of some countercyclical behavior of the fiscal result. Thus, the 90s show *an improvement* in the management in fiscal policy, at least relative to previous decades. This may be due to the fact that the 1988 Coparticipation law restricted substantially the degree of discretionary transfers as explained in section II as carefully explained in Nuñez Miñana (1998). However, the results are very small, indicating that a 1% increase in output growth leads to an improvement of the fiscal result of .09% of GDP.

These results however are subject to important endogeneity concerns, and can only provide a general overview. Table 2 focuses on the period since 1990, and disaggregates revenues and spending expanding Table 7 in Gavin *et al* (1996) by showing the procyclicality of the overall fiscal balance, spending and revenues for the federal government, for subnational governments and for large and small subnational governments.²²

¹⁹ For misgivings about the Fiscal Responsibility Law and the defense of still more powerful institutions to assure sound fiscal policy in Brazil, see Wyplosz (2003).

²⁰ Kaminsky Reinhart and Vegh (2004) define procyclicality in terms of policies: government expenditures and tax rates. Here we prefer to stick to outcomes: expenditure, total revenues and fiscal surpluses. While these are endogenous variables, policy functions are adjusted to deliver a value for these variables.

²¹ Data has been taken from Gerchunoff and Llach (2003).

²² This work was possible because researchers at CEPAL generously provided the provincial GDP data.

The methodology looks again at a simple correlation between output and the fiscal variables, except that they include fixed effects by jurisdiction in all the regression that pools information from different provinces. The specification, is simply,

$$\Delta Surplus_t = \mathbf{a} + \mathbf{b}g_t + \mathbf{m} + \mathbf{e}_t$$

$$\Delta Revenues_t = \mathbf{a} + \mathbf{b}g_t + \mathbf{m} + \mathbf{e}_t$$

$$\Delta Expenditures_t = \mathbf{a} + \mathbf{b}g_t + \mathbf{m} + \mathbf{e}_t$$

where $\Delta Revenues$ and $\Delta Expenditures$, refer to the rate of change in each of those two variables and $\Delta Surplus$ to the change in the fiscal result as a percentage of local GDP. The coefficients should be interpreted as how much fiscal balances, revenues and expenditures, change in response to a 1% change in GDP, though because of the fixed effect these coefficients should be interpreted as “within” each jurisdiction. What is new in our analysis is that the interpretation of g_t may vary as we run these regressions not only relating the fiscal variables to *national output*, as has been standard, but also to *provincial output*. It is surprising that this second exercise has not been implemented before as an evaluation of the procyclicality of the fiscal policy of subnational governments should consider how resources smooth the local business cycle, not the national cycle.²³ We also run a series of IV regressions to correct for the endogeneity of the right hand side variable (output) to the dependent variable (fiscal policy). We instrument using the international interest rate, world growth and Argentina’s terms of trade.

Table 2 and Figure 3 show the results computed from the time series for each aggregate. As the correlation is computed as the coefficient of a simple regression, the table indicates the statistical significance of the coefficient.²⁴ The numbers show at the federal level some evidence of a countercyclical fiscal policy. Both tax revenues and expenditures appear to be much more procyclical than in either OECD or Latin America countries, but all in all, this delivers a fiscal policy that appears to be countercyclical in about the same range as in the OECD. Figure 3 shows the scatter plot with the results.

This pattern differs when considering the provinces. There we see an equally highly procyclical income and revenues relative to national output, however while the national government had an overall fiscal policy that was countercyclical, fiscal results for subnational governments show a procyclical result, ie. the surplus falls when output increases. Consistent with conventional wisdom, small provinces appear to be much more procyclical than larger provinces, particularly on the spending side. All results are virtually unchanged when IV estimation is used.

However, when looking at the relation between revenues, spending and *local output*, a far more important measure of procyclicality, the numbers are much smaller, particularly for small provinces, and because the link weakens mostly for revenues this increases the procyclicality of fiscal variables. Here the IV estimates deliver a different result, increasing the procyclicality of revenues significantly, and leading to an overall acyclical policy. This is an important result that modifies a fair amount of conventional wisdom in this area: once only exogenous changes in output are considered, fiscal policy of subnational jurisdictions become acyclical, rather than procyclical. At any rate, the conclusion is that small provinces are more procyclical than larger provinces, and exhibit a procyclical or acyclical fiscal policy depending on the estimation technique.

²³ Piffano *et al* (1998) provide the most careful analysis of procyclicality to date, but the analysis is squarely focused on the relation with national output.

²⁴ A *, **, *** indicate significance at the 10, 5 and 1 percent respectively.

Next we address the issue of the sources of procyclicality of provincial revenues by looking at the components that add up to total tax collection. Table 3 shows the results. As can be seen from the table, revenues are strongly procyclical. However when dividing the sources of revenues in taxes and transfers from the central government (as well as the total of resources that are not transfers) we find that the tax component is uniformly more procyclical than the resources obtained from national sources. Among the taxes it is *ingresos brutos*, a cascading sales tax, the one with the highest degree of procyclicality while property taxes, as expected have very little relation with the business cycle.²⁵ This suggests that the procyclicality of provincial governments may not be explained by the specifics of the current transfer scheme between the national government and the provinces.

However, these measures of procyclicality are computed by looking at the rate of change of each revenue source and how it relates to changes in local or national output. But which is more important as a source of procyclicality? This requires taking into account the relative size of each component. To do this we look at how the change in the sources of income in terms of local GDP relates to the local and national business cycle. By referencing to GDP we can obtain a measure of the quantitative importance of each source. The results are presented in Table 4 which shows again that most income sources are procyclical. For the provinces as a whole both sources, national and local resources are roughly equally important as source of procyclicality. However the relative importance for each jurisdiction depends on the size of the province. For large provinces, taxes collected at the level of the jurisdiction are more important as sources of procyclicality. For small provinces, national transfers are the key drivers of procyclicality. This, of course, mimics the relative importance of revenue sources in a context in which all sources are procyclical.

The role of local taxation in the Argentina federal system had already been stressed in pioneering work by Horacio Nuñez Miñana almost thirty years ago (see Nuñez Miñana, 1974) who had already identified the (growing) importance of local resources in the analysis of fiscal federalism and in explaining its procyclicality.²⁶ More recently Piffano *et al* (1998) also studied the cyclical properties of local taxes, and while they show that local revenues magnified the procyclicality of total resources they fell short of quantifying the point that we believe is one of the main conclusions of this work (particularly considering the amount of energy that has associated the “coparticipation” regime as the sole source of the procyclicality of government resources), that transfers and local sources of revenues are equally responsible for the procyclicality of local revenues.

Testing the sources of procyclicality

So far we have shown that government expenditure shows differing degree of procyclicality across jurisdictions. If the objective is to reduce the degree of procyclicality when present, it is necessary to understand why this procyclicality occurs. In cross country analysis, the literature has addressed this issue by relating the procyclicality of government expenditure, for example, to a number of economy characteristics.²⁷

In this section we take a similar approach, but concentrating our focus on the subnational entities. In particular, we ask ourselves about the determinants of procyclicality for subnational

²⁵ Some provinces have transferred part of the property tax to local governments, thus reducing the degree or cyclicity of that income source.

²⁶ See also Nuñez Miñana and Porto (1980, 1982).

²⁷ See for example Lane (2002) and Stein *et al* (1999).

entities in Argentina. In particular we want to test to what extent the theories discussed above can explain the cross jurisdiction variability in procyclicality. Similar exercises for a cross section of countries include Stein *et al* (1999), Lane (2003) and by Talvi and Vegh (2000) among others.

For the case of subnational governments we could refer to the three channels by which spending becomes procyclical discussed in section II. One is the effect of changes in market access for the subnational governments that argues that procyclicality arises from the fact that jurisdictions may get cut off from financial markets during downturns. Empirically this suggests relating the degree of cyclicity to the stock of provincial debt, as well as to the size of the economy (under the weak assumption that larger jurisdictions are more likely to access credit). The fiscal voracity argument points out that procyclicality arises from the fact that governments are subject to larger pressures for fiscal resources during booms. This suggests relating the procyclicality of public expenditure to the procyclicality of fiscal revenues. Similarly, one could argue that a jurisdiction that receives a larger share of resources from the federal government is more likely to be subject to fiscal pressures, and therefore more likely to exhibit procyclicality. Finally, there is the possibility that provinces prey the federal government. In this case procyclicality arises because provinces seek national resources when the federal government has more resources or easier access to credit. Thus market access of the national government is relevant, enticing subnational jurisdictions to predate those resources. Predation of fiscal resources can also occur by engineering a crisis that forces a bailout from the national level. In this regard, size may imply a greater likelihood of a bailout, as the national government may perceive large jurisdictions as “too big to fail” (on the other hand it may be easier to bail out a smaller jurisdiction, and the incentives to do so may be there if they are overrepresented in the political system). Coincidence of the presidential party with that of the governor also may work in the same direction.²⁸

Table 5 summarizes the different hypothesis and their implications on the expected degree of procyclicality. To start analyzing this issue Table 6 looks at the procyclicality of the three variables, expenditure, revenue and fiscal balances, by province. Again the procyclicality is measured relative both to national output and to each province’s GDP and computed with OLS. The table shows that there is substantial volatility in behavior. For example during the 90s, the procyclicality of government expenditures ranged from a low of .3 for Neuquén to a high of 1.9 for the Province of Buenos Aires relative to national output (almost 3 relative to local output in Corrientes!). Both government expenditure and revenues correlate more strongly with local output than with national output, the difference being stronger on the revenue side.

Table 7 shows the results of relating the coefficient of procyclicality of expenditures to the variables that may explain this behavior at the provincial level. Provincial debt is considered in 2001, as reliable data for that year can be obtained from Cetrangolo and Jimenez (2003). Size is measured as provincial output as a percentage of national GDP also considered in 2001. The procyclicality of revenues is taken from Table 6, and captures the response of revenues to output changes. The share of resources obtained from transfers is taken as the average for the period. The presidential party dummy adds the number of years in which the party of the president coincided with that of the governor during the time period. We also include a dummy for oil producing provinces which have an alternative, mostly exogenous, source of revenue.

As can be seen (either when the coefficients are obtained when relating to national output or to local output) all variables are non significant with the exception of the procyclicality of the revenues that appears with the expected positive sign. The higher the degree of procyclicality of own resources the higher the degree of procyclicality of government expenditures. In all the

²⁸ As long as the two are not political rivals.

results seem to provide fairly strong evidence in favor of a procyclicality that comes from very procyclical revenues at the provincial level, with little impact from other interpretations, such as the credit channel and the possibility of predation of national resources.

b. Brazil

Due to the lack of data by jurisdiction, the analysis of the degree of procyclicality of the spending of subnational governments in Brazil will not be made along the same lines that were followed in the case of Argentina. However, the different approach provides a complementary analysis.

There is now a good consistent data set, with monthly series of aggregate fiscal variables for state and municipalities in Brazil. But the series are somewhat short as they start in January 1997.²⁹ However, it could be argued that there is no point in being too worried about detecting fiscal-policy procyclicality during the eighties and early nineties. Under the fiscal regime that prevailed in Brazil over that period, there were all kinds of reasons for the existence of a high degree of procyclicality. A much more interesting question is to detect to what extent procyclicality has subsisted the drastic change of fiscal regime observed since the late nineties in Brazil. From that perspective, the relevant period is exactly the most recent one, for which data is available.

Unfortunately, the mentioned data set does not include a series of aggregate primary expenditures of subnational governments. But it does include receipts of the three most important state taxes, comprising more than 90% of the of total tax revenue collected at the state level. It also includes data on federal transfers to subnational governments and on the aggregate primary balance of states and municipalities. Based on the available data, an acceptable estimate of the aggregate primary expenditures of state and municipalities was constructed as: *revenue from the three most important state-level taxes + federal transfers to states and municipalities - aggregate primary balance of states and municipalities*

As less important state-level taxes and taxes directly collected by municipalities are not taken into account, the true value of the aggregate primary expenditures of state and municipalities would surely be underestimated. However, the discrepancy would be relatively small (approximately 14% in 2002, which is acceptable, since it is the cyclical behavior of the variable that will be under analysis).

As a reliable seasonally-adjusted real GDP index is only available on a quarterly basis, a real seasonally-adjusted quarterly series of the estimate was generated.³⁰ A Hodrick-Prescott filter was then used to obtain the cyclical components of both series, in order to analyze the degree of procyclicality.³¹ A regression between these two components provides a measure of procyclicality. This and similar results for other fiscal variables are shown in Table 8 and Figure 4. As in the case of Argentina the results suggest a substantial degree of procyclicality of primary expenditures.

²⁹ The data is available in www.ipeadata.gov.br.

³⁰ The series were deflated by the IPCA, a consumer price index.

³¹ In order to obtain the cyclical components, the HP filter was applied to the logarithms of both series. Braun and Gresia (2003) used the same procedure to study the degree of procyclicality of social expenditures in Latin America.

As there are only 28 observations, one has to be very careful about drawing conclusions about procyclicality. But, having that in mind, we may attempt to get further insights, asking several interesting questions that mimic those asked for Argentina. What are the main factors behind the detected procyclicality of the primary expenditures of subnational governments in Brazil? To what extent may it be attributed to the cyclical behavior of federal transfers? To what degree does it stem from the procyclicality of the tax revenue directly collected by subnational governments? What has been the effect of the primary balance?

First of all, it seems clear that the procyclicality of the primary expenditures of subnational governments simply reflects the highly procyclical behavior of their revenue (see Table 8 and Figure 4). Taking as an estimate of that revenue the sum of the receipts of the three most important state-level taxes plus federal transfers to states and municipalities, one also finds a large level of procyclicality, though slightly smaller than for expenditures.

Notice that this equation has a much higher R-squared than the previous one. Thus there seems to be grounds to affirm that the aggregate primary balance has been contributing to avoid that the high degree of synchronization that has been observed between the cyclical movements of the aggregate revenue and the GDP shows up with the same intensity in the relation between the cyclical components of the aggregate expenditures and the GDP. A quite interesting result, that has to do with new fiscal regime that has been imposed on subnational governments in Brazil since the late nineties.

The main source of the procyclicality appears to be the behavior of the tax revenue directly collected by subnational governments. In fact, the strong procyclicality of the revenue from the three most important state-level taxes is also shown in Table 8 and Figure 4.

One may also say that the procyclical behavior of the revenue from the three most important state-level taxes stems in turn from the high procyclicality of the ICMS revenue. The ICMS, a value added tax, is by far the most important state tax, and as shown in Table 8 and Figure 4 it is also procyclical.

But it is important to note that, though the procyclicality of the revenue from the three most important state-level taxes seems to be dominated by the procyclical behavior of the ICMS, the combined revenue of the other two state taxes also show some procyclicality. Those taxes are the IPVA (imposed on motor-vehicles) and the property-transfer tax.

What about the cyclical behavior of the federal transfers? The results in Table 8 and figure 4 suggest that it is hard to conclude that total federal transfers have been procyclical over the period. In fact even if only constitutional transfers are taken into consideration, no procyclical pattern seems to emerge either. Constitutional transfers are by far the most important part of the total federal transfers. The revenue-sharing arrangement established by the Constitution is mainly based on two taxes collected by the federal government. One of them is the income tax, which in Brazil includes both a personal income tax and a profit-tax imposed on firms. The other is the IPI, a tax on industrialized products. The federal government is supposed to transfer to states and municipalities 47% of the income tax revenue and 57% of the IPI revenue. In spite of the fact that the IPI revenue has proved to be highly procyclical, as confirmed in Table 8, the cyclical behavior of constitutional transfers seems to have been dominated by the evolution of the income tax revenue that, at first sight, has shown no evidence of procyclicality over the period.

As a matter of fact, it is not difficult to make sense of this seemingly erratic behavior. The spike in 1999:1, for example, is explained by the effects of the sharp exchange-rate devaluation on the income tax collected on capital gains. The other spike in 2002 is due to a sudden large payment of income tax in arrears by major pension funds, in the wake of a long judicial fight. If such explanations were taken into account and the effects of those outlying points eliminated, one may get some evidence of procyclicality in the behavior of constitutional transfers, but if the current pattern remains one should expect the tax to remain mostly unrelated to business fluctuations.

The analysis conducted above, to determine to what extent subnational governments have been a source of fiscal-policy procyclicality in Brazil, was all based on aggregate fiscal variables, where states and municipalities were taken as a whole. It goes without saying that it would be interesting if the same kind of analysis could be replicated for each individual state. Unfortunately that is not possible as there are no reliable reasonably frequent state-level fiscal data to work with. Though the aggregate value of the primary balance of state and municipal governments has been published monthly by the Central Bank for quite some time, state governments do not allow the Bank to disclose each individual state's primary balance. For the most recent period, since 2001, after the Fiscal Responsibility Law, there is good non-annual data available. However the series are irremediably short.

At any rate the picture that emerges from the analysis of the Brazilian evidence seems to be quite clear and fairly consistent with that of Argentina. The available fiscal data seems to indicate that the spending of subnational governments, at the state-level in particular, has shown a marked degree of procyclicality. But the main reasons behind the procyclical pattern are not to be found in the behavior of federal transfers. They clearly stem from the tax revenues directly collected by subnational governments, especially from the ICMS, the main state-level tax.

V. Conclusions

Having analyzed to what extent subnational governments have been a source of fiscal-policy procyclicality in both Argentina and Brazil, we are able to draw some interesting conclusions. Despite all the differences in the specificities of the fiscal-federalism arrangements of the two countries, the evidence that stems from our analysis suggests that there are important common features in how subnational governments have been affecting fiscal-policy procyclicality in Argentina and Brazil.

We have found that the spending of subnational governments has been markedly procyclical in both countries. But quite contrary to what seems to be a widespread belief, the observed procyclicality cannot be attributed, or at least cannot be solely attributed, to the behavior of federal transfers. In both countries, though more so in Brazil than in Argentina, the main source of procyclicality is to be found in the highly procyclical pattern of tax revenues directly collected by subnational governments. So it is not the flow of federal transfers that makes the spending of subnational governments procyclical but their tax structures.

It should be mentioned that, in the case of Brazil, the sharp change in the fiscal regime that took place since the end of 1998 has implied some dampening of the procyclicality of the primary spending of subnational governments, as the states and large municipalities have been finally put under a hard budget constraint, and forced to generate a reasonably sizable primary surplus to service their rescheduled debt to the Union.

These results have an important implication. In order to reduce the procyclicality of the expenditures of either, Argentine provinces or Brazilian states, one should focus, not on redesigning rules and practices of intergovernmental transfers, but on creating better institutions that reduce the degree by which this very procyclical tax base becomes government expenditure. No small task, in both countries.

Countercyclical measures to smooth de facto the resources collected by subnational governments could also be considered. Unfortunately, many attempts to build these countercyclical measures are enshrined in the law but have very little impact on real policies. The design of fiscal rules that work is a complex matter, particularly in societies subject to large instability. To illustrate how complex the anticipation of the effects of a particular fiscal design may be, just consider the following remarks from the World Bank study, *Beyond the Center, Decentralizing the State* issued in 1999 (Burki *et al*, 1999). This study referred to the experiences of Argentina and Brazil in the following way:

“Argentina: the successful institutionalization of a hard budget constraint on provinces.

Fiscal deficits at the federal level were a major problem in Argentina before 1991, leading to hyperinflation, which reached over 5,000 percent in 1989. Provincial deficits and indirect bailouts of provincial banks, which had access to central bank credit, contributed to the financial difficulties of the period. Provinces accounted for at least half of the public sector deficits that fueled the hyperinflation.

In addition to major improvements at the national level - committing legally to currency convertibility at a fixed rate with the dollar (the Convertibility Law), cutting the budget deficit, and privatizing major industries - the steps to improve subnational finances in the 1990s were also important for the success of macroeconomic stabilization.

The strong anti-inflation commitment after 1991 and tight limits on central bank credit to the public sector in Argentina limited subnational spending and deficits in two ways. First, it allowed the federal government to reject provincial pleas for more resources after the Tequila shock, with the rationale that it could not increase transfers without endangering the stabilization gains and the survival of the Currency Board system. Second, it constrained the ability of the provinces to borrow from their own banks by tightening bank regulations and eliminating local government access to the central bank rediscount facility. After the 1994-95 economic shock, most provinces had to recapitalize or privatize their banks - borrowing from them was not an option. Eighteen of the provincial banks were privatized during 1994-96 and more have gone through the process since then (World Bank 1998).

The timing had been good. Making changes before the crisis had forced the provinces to adjust turned out to be of critical importance for the institutionalization of the hard budget constraint in subnational finances in Argentina.

Brazil: Repeated rescheduling. No hard budget constraint for the states.

A state debt crisis was not the main macroeconomic problem that observers expected from decentralization in Brazil.

They feared that the large increase in tax sharing mandated by the 1988 constitution would provoke federal deficits, because the federal government would not cut its ordinary (non-transfer) expenditures or raise federal taxes by an equivalent amount.

Nevertheless, fiscal adjustment ultimately occurred at the federal level.

The main macroeconomic problem with decentralization, however, arose from excessive state deficits and then mismanagement of the debt.

In the earlier debt crises, the debt agreements established three precedents that influenced subsequent agreements. First, the federal government actually put the state debt on its books and then provided relief in the form of rescheduling, rather than forgiveness. Second, through the combination of grace periods, rescheduling, and debt service caps, the agreements reduce the debt service burden of sitting administrations, leaving the fiscal consequences to their successors.

The repeated cycle of the federal government refinancing state debt, coupled with caps on debt service, had the perverse incentive effects that one would expect. By the time some consensus for action had been reached, the number of bankrupt states was too large to allow them all to fail, and their debt had grown too large for any solution without substantial debt relief to work.

At the beginning of the 1990s, Brazilian subnational debt as a share of GDP was at a level similar to Argentina's, but by 1997 it had more than doubled. Unfortunately, the Brazilian stabilization program of 1994, the most successful to date, left unchanged many rules and institutions, which motivated the states to let their debt grow. Most of this debt was owed to the central government or to state banks, and until the debt-rescheduling agreements in 1998, much of it was not being serviced by the states. Interest was being capitalized. As a result, state debt and deficits were a direct fiscal problem for the central government and for the overall public sector."

As the reader may have anticipated, only a few years later, however, Argentina was in the midst of a large fiscal crisis mostly triggered by irresponsible behavior at the provincial level (the federal government had engineered during that year an adjustment of about 4 percent of GDP, through a combination of spending cuts and tax hikes, while provinces increased their imbalances), while Brazil appeared to be consolidating its fiscal position both at the federal and subnational level on the basis of stricter application of fiscal rules.

When rules were expected to work they didn't, where they were not expected to work they did. There are no clear cut recommendations to build working fiscal systems, but what is clear is that focusing on the wrong issue is not the way to start. This paper has shown that if procyclicality of fiscal policy is the concern, the solution should not be searched in a revamping of tax sharing rules but on developing better fiscal institutions within each jurisdiction.

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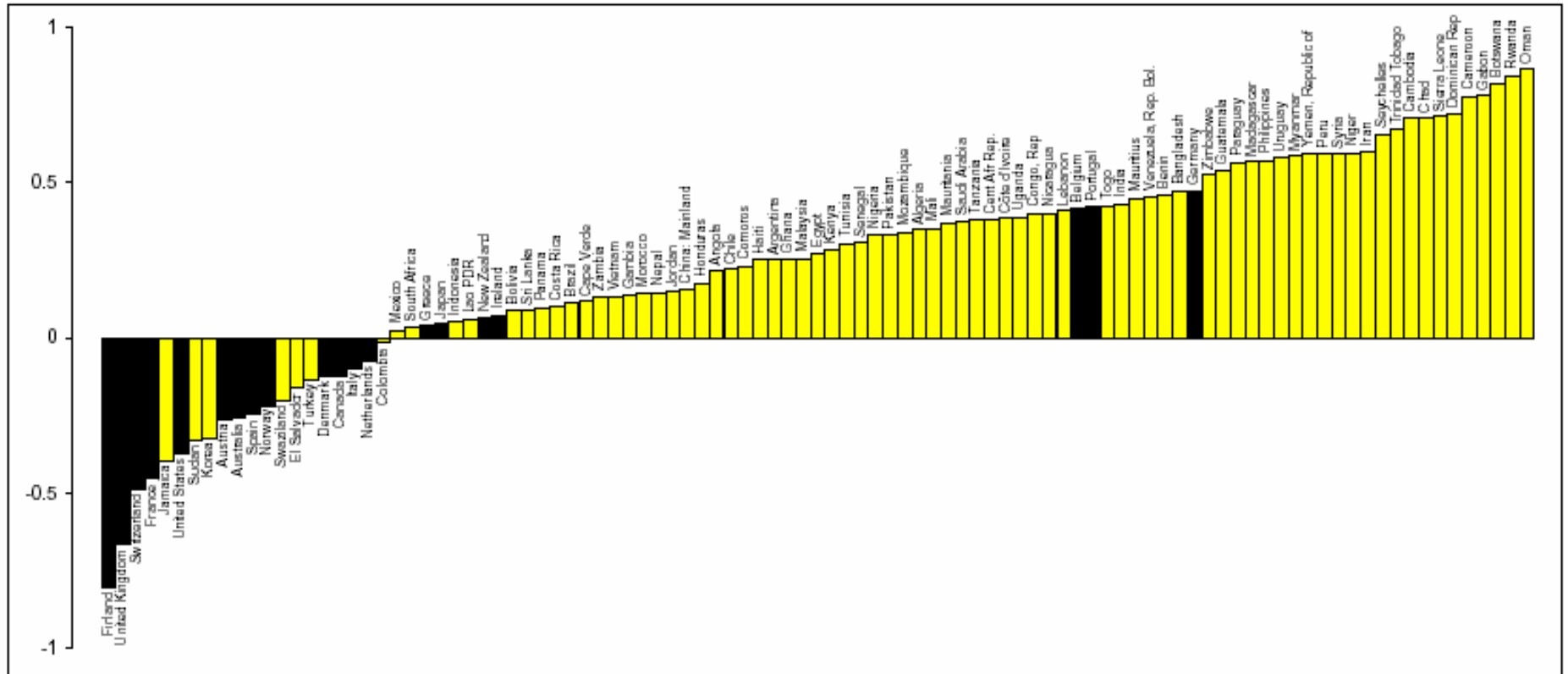
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Figure 1a. Procyclicality of Fiscal Policy



Source: Kaminsky, Reinhart and Vegh (2004).

Figure 1b. Procyclicality of Fiscal Policy

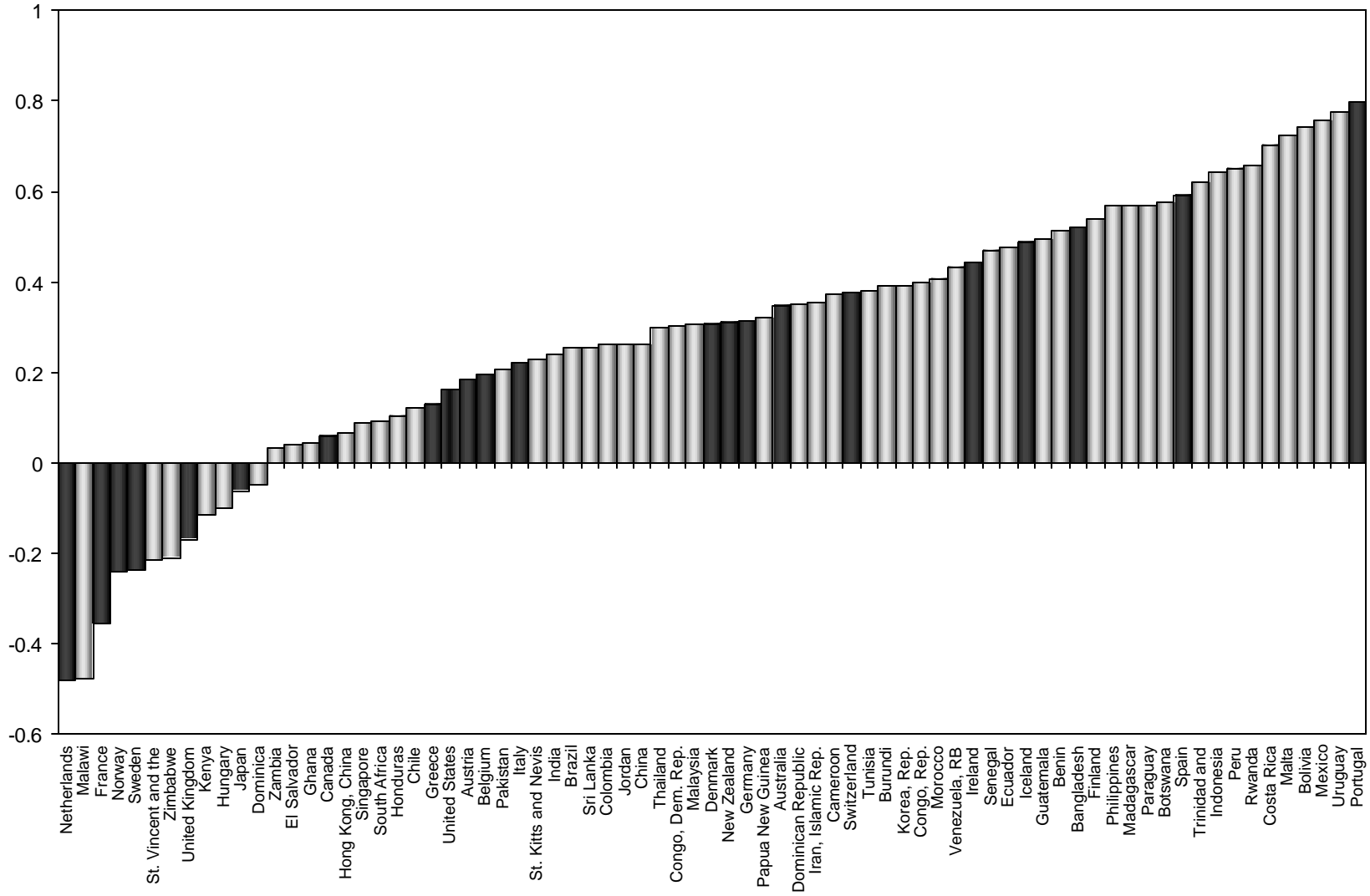


Figure 2. Procyclicality of Fiscal Result

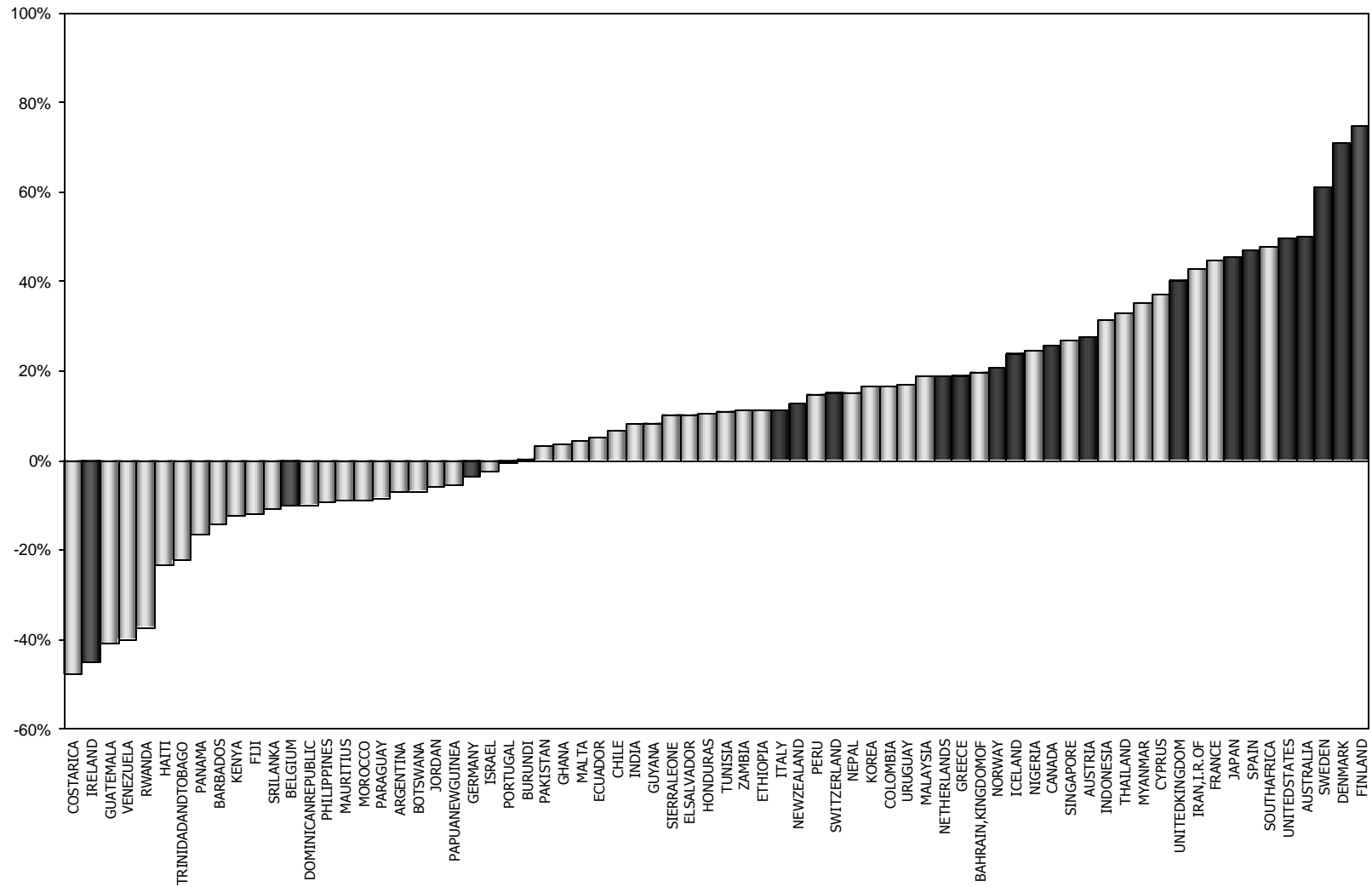


Table 1. Procyclicality in the 20th Century: Argentina

	Change in surplus									
	1914-2001	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s
GDP Growth	0.049 (0.036)	0.114* (0.053)	0.086 (0.16)	-0.051 (0.077)	0.136 (0.087)	-0.253* (0.115)	0.164 (0.137)	0.325 (0.304)	-0.022 (0.157)	0.089* (0.05)
Constant	-0.156 (0.206)	0.069 (0.484)	-0.678 (1.019)	-0.096 (0.379)	-0.645 (0.529)	0.536 (0.569)	-0.323 (0.844)	-1.256 (1.286)	0.085 (0.74)	-0.206 (0.275)
Observations	88	6	10	10	10	10	10	10	10	12
R-squared	0.02	0.53	0.04	0.05	0.23	0.37	0.15	0.13	0.01	0.25

**Table 2. Cyclical Response of Fiscal Policy
Argentina 1992-2002**

	OLS			Instrumental Variables		
	Revenues	Expenditures	Surplus	Revenues	Expenditures	Surplus
OECD (1)	0.84	0.09	0.25	-	-	-
Latin America (1) with GDP	1.32	0.61	0.08	-	-	-
Argentina	1.430 (0.293)***	1.500 (0.362)***	0.205 (0.073)**	1.196 (0.373)**	1.410 (0.447)**	0.243 (0.091)**
Total Provinces	1.470 (0.091)***	1.391 (0.113)***	-0.056 (0.028)*	1.479 (0.112)***	1.276 (0.139)***	-0.016 (0.04)
Big Provinces	1.832 (0.16)***	0.53 (0.43)	0.023 (0.03)	1.851 (0.229)***	0.062 (0.62)	0.013 (0.04)
Small Provinces	1.389 (0.103)***	1.332 (0.127)***	-0.064 (0.034)*	1.404 (0.127)***	1.225 (0.157)***	-0.019 (0.04)
with local PBG						
Total Provinces	1.124 (0.112)***	1.224 (0.123)***	-0.085 (0.029)***	2.011 (0.202)***	1.577 (0.205)***	0.063 (0.06)
Big Provinces	1.792 (0.199)***	0.813 (0.441)*	-0.001 (0.031)	2.069 (0.316)***	0.147 (0.70)	0.016 (0.05)
Small Provinces	1.000 (0.126)***	1.127 (0.140)**	-0.095 (0.034)***	2.041 (0.258)***	1.633 (0.258)**	0.003 (0.062)

(1) Taken from Gavin et al (1996).

**Table 3. Procyclicality of Provincial Resources in Argentina
1992-2002**

with Local GDP

	Total Revenues	Total Revenues - Transfers	Taxes	Ingresos Brutos	Property Tax	Coparticipación	Transfers from Fed. Gov.
Total Provinces	1.164 (0.117)***	0.977 (0.245)***	1.551 (0.167)***	1.309 (0.222)***	0.63 (0.52)	1.412 (0.103)***	1.294 (0.103)***
Big Provinces	1.013 (0.413)**	1.889 (0.300)***	1.879 (0.255)***	1.988 (0.892)**	1.225 (0.661)*	1.069 (0.64)	0.624 (0.42)
Small Provinces	1.032 (0.133)***	0.786 (0.287)***	1.470 (0.194)***	1.143 (0.253)*	0.445 (0.63)	1.417 (0.117)***	1.273 (0.113)***

with National GDP

	Total Revenues	Total Revenues - Transfers	Taxes	Ingresos Brutos	Property Tax	Coparticipación	Transfers from Fed. Gov.
Total Provinces	1.341 (0.100)***	1.359 (0.224)***	1.860 (0.140)***	1.996 (0.186)***	0.858 (0.493)*	1.363 (0.097)***	1.450 (0.083)***
Big Provinces	1.831 (0.3943)**	1.938 (0.272)***	1.831 (0.228)***	2.049 (0.830)**	1.172 (0.618)*	0.982 (0.611)	0.5 (0.394)
Small Provinces	1.236 (0.133)***	1.243 (0.263)***	1.825 (0.163)***	1.913 (0.213)***	0.721 (0.59)	1.362 (0.108)***	1.445 (0.090)***

**Table 4. Procyclicality of Provincial Resources Argentina
1992-2002**

<i>with Local Gross Product</i>							
	<i>Own resources</i>				<i>Transfers</i>		
	Total Revenues	Total	Tax	Other	Total Transfers	Discretionary	Coparticipation
Total Provinces (aggregate)	0.198 (0.026)***	0.089 (0.016)**	0.076 (0.010)***	0.012 (0.010)	0.110 (0.018)***	0.036 (0.016)***	0.073 (0.014)***
Big Provinces	0.148 (0.018)***	0.082 (0.125)***	0.074 (0.007)***	0.008 (0.009)	0.065 (0.012)***	0.021 (0.008)***	0.045 (0.009)***
Small Provinces	0.248 (0.030)***	0.044 (0.021)**	0.040 (0.004)***	0.002 (0.020)	0.206 (0.020)***	0.059 (0.004)***	0.148 (0.014)***

<i>with National Gross Product</i>							
	<i>Own resources</i>				<i>Transfers</i>		
	Total Revenues	Total	Tax	Other	Total Transfers	Discretionary	Coparticipation
Total Provinces (aggregate)	0.184 (0.016)***	0.084 (0.011)***	0.071 (0.006)***	0.013 (0.009)	0.100 (0.015)***	0.038 (0.013)**	0.062 (0.014)***
Big Provinces	0.157 (0.014)***	0.083 (0.012)***	0.076 (0.006)***	0.007 (0.009)	0.074 (0.009)***	0.029 (0.007)***	0.046 (0.008)***
Small Provinces	0.318 (0.024)***	0.059 (0.019)***	0.050 (0.004)***	0.006 (0.019)	0.262 (0.014)***	0.090 (0.010)***	0.172 (0.012)***

Table 5. Testing Procyclicality at the Subnational Level

Market Access	Fiscal Voracity within provinces	Voracity on Federal Government
Prov. Debt (+) Size (+)	Procyclicality of Revenue (+) Output volatility (+) Volatility of revenues (+) % of resources from transfers (+)	Market access of Federal Government (+) Presidential party of Gov. (+ if same as Fed. Gov.) Size (?)

**Table 6. Procyclicality by Province in Argentina
1992-2002**

	Expenditures		Revenues		Surplus/local gdp	
	local	national	local	national	local	national
Buenos Aires	1.974***	1.885***	2.298***	2.255***	-0.029	-0.029
CBsAs	1.335**	1.463**	1.566***	1.772***	0.004	0.007
Catamarca	0.641	1.722***	0.431	1.647***	-0.112	-0.132
Chaco	1.491*	1.543***	1.364**	1.353***	-0.252	-0.178
Chubut	1.102**	1.180***	0.012	0.036	-0.210*	-0.222**
Cordoba	1.764**	1.788**	1.744***	1.968***	-0.044	-0.026
Corrientes	2.904***	1.693***	1.950**	1.590***	-0.232*	-0.06
Entre Ríos	1.853***	1.477**	1.760***	1.916***	-0.079	0.021
Formosa	2.338***	1.339**	2.068***	1.394***	-0.544	-0.215
Jujuy	0.366	0.726	0.519	1.033**	-0.056	-0.011
La Pampa	1.598*	1.459*	1.164**	1.119***	-0.188	-0.155
La Rioja	1.699**	1.251**	1.733**	1.516***	-0.153	-0.048
Mendoza	1.437	1.796*	2.197*	2.440**	0.090	0.078
Misiones	1.683**	1.579**	1.789***	1.728***	-0.033	-0.028
Nuequen	0.819	0.366	0.204	0.062	-0.171	-0.100
Río Negro	0.547	1.461*	1.034	1.362**	0.061	-0.087
Salta	0.64	1.521***	0.179	1.706**	-0.067	0.088
San Juan	1.798**	1.648**	1.832***	1.863***	-0.085	-0.035
San Luis	0.899	0.714	1.242***	1.131***	-0.01	0.016
Santa Cruz	0.763*	0.861*	0.54	0.796	-0.082	-0.08
Santa Fe	2.176***	1.613***	1.556***	1.488***	-0.083	-0.022
Santiago del Estero	1.980***	1.449***	1.795***	1.123***	-0.165	-0.166
Tierra del Fuego	1.089*	1.716**	0.943	2.531***	-0.089	0.011
Tucumán	0.668	1.126*	1.387***	1.432***	0.077	0.030
Average	<i>0.752</i>	<i>0.602</i>	<i>0.483</i>	<i>0.298</i>	<i>-0.091</i>	<i>-0.049</i>

Table 7. Sources of Procyclicality

	Expenditures relative to local gdp	Expenditures relative to national gdp
Income Procyclicality	0.731*** (0.182)	0.451*** (0.098)
No. of years party pres = party gov	-0.015 (0.029)	-0.021 (0.015)
Prov. PBG / GDP	-0.006 (0.018)	0.015 (0.010)
% from coparticipación	0.003 (0.008)	0.006 (0.004)
Prov. Debt / PBG (2001)	-0.003 (0.007)	-0.003 (0.004)
Dummy - Oil Provinces	-0.287 (0.276)	-0.080 (0.151)
Constant	0.314 (0.452)	0.440 (0.279)
Observations	24	24
R-squared	0.628	0.672

Table 8. Correlation between output and fiscal variables of subnational governments in Brazil

	Coefficients	R-squared
Primary Expenditures	2.555 (0.615)***	0.40
Revenue	2.174 (0.569)***	0.59
Tax Revenue Directly Collected	2.061 (0.476)***	0.78
Revenue from the ICMS	2.104 (0.484)***	0.78
Motor-vehicle and Property Taxes	2.262 (0.937)***	0.18
Federal Transfers	1.497 (1.061)	0.13
Constitutional Transfers	1.442 (0.968)	0.07
Revenue from the Tax on Industrialized Products	3.265 (0.854)***	0.56
Income Tax Revenue	-1.161 (1.238)	0.03

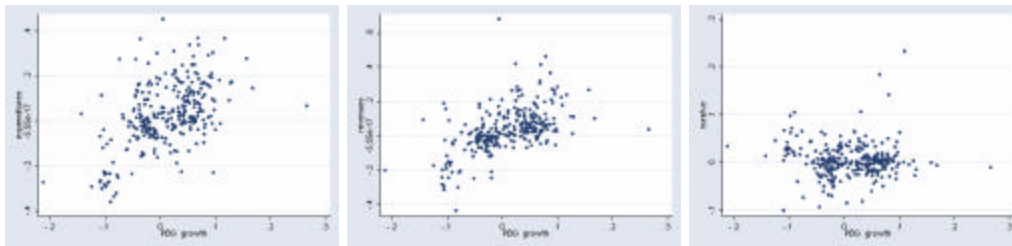
Figure 3. Cross plots of local output growth and fiscal variables in Argentina

Total Provinces

Surplus

Revenues

Expenditure

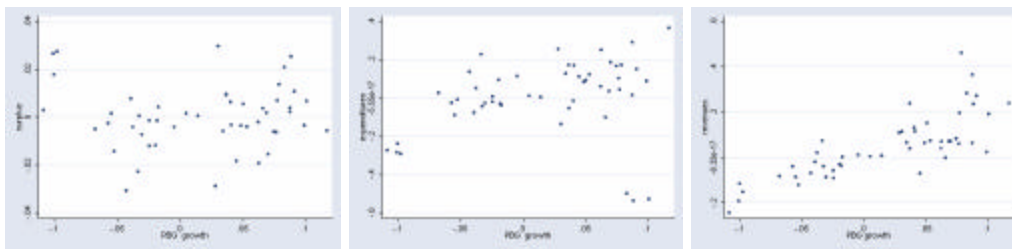


Big Provinces

Surplus

Revenues

Expenditure



Small Provinces

Surplus

Revenues

Expenditure

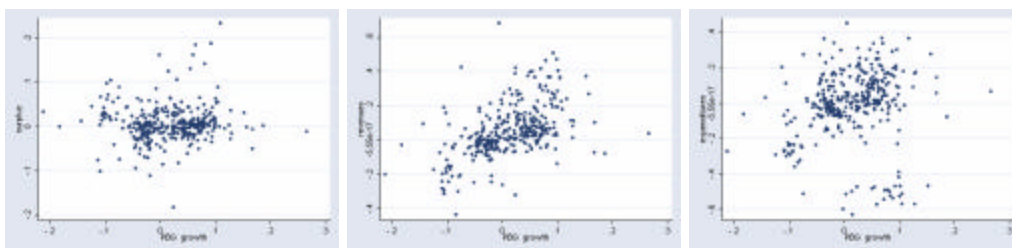


Figure 4: Cross plots of output growth and fiscal variables in Brazil

