Argentina. Are Vertical Transfers Deteriorating Sub-national Governments Revenue Effort? 1/

D. Artana, S. Auguste, M. Cristini, C. Moskovits and I. Templado

Abstract: Vertical transfers in Argentina have encouraged an expansion of provincial expenditures. In this paper we estimate the impact of vertical transfers on own-source sub-national revenue effort. The results suggest provinces react differently to central government transfers, depending on the nature of the transfer. Automatic transfers are consumed and, at the same time, they increase the tax bases of some provincial taxes easing higher revenues. This reaction is consistent with a permanent income shock. But discretionary transfers are seen as temporary income. Provinces use part of them to increase capital expenditures and another part to reduce own taxes. This reduction may be reversed later if the political game (or shortages of funds) force a reduction for the discretional amounts received from the Federal government. This is a particular type of the "flypaper effect".

JEL Classification: H77. R12. C22. C23. C26

1. Introduction

Argentina is a federal country where sub-national governments account for a relatively large fraction of government revenues and expenditures. Considering only those revenues defined and collected under full sub-national autonomy,[1] in 2009 the 24 Argentine provinces and the about 2200 municipalities collected about 6.4% of GDP or one fifth of the revenues and spent about one half of the expenditures of the Consolidated Government.[2] It follows that there is a vertical imbalance that is higher for provinces than for local governments and tends to be higher for small and poorer provinces. This gap is filled by an automatic revenue sharing system of federal taxes that, in turn, most provinces share with their own local governments, and by discretionary transfers.[3]

Argentina's federalism has been criticized for the existence of soft-budget constrains combined with periodic bail outs from the federal government to the provinces,[4] and the lack of transparent criteria for the secondary distribution of federal taxes among provinces.[5] Moreover, institutional pitfalls led Argentina's federalism into two extremes: too much rigidity or too loose framework, given the lack of incentives of the political actors to strike cooperative agreements and the inability of the federal government to make credible commitments. As a consequence, sub-national governments focused on continuous bids for additional resources instead of focusing on developing managerial efforts or improving their own-source revenues.[6]

Many studies have shown that the vertical imbalance of Argentine provinces is associated with higher per capita expenditures and a weaker fiscal performance.[7] Only a few studies tried to estimate the impact of high vertical imbalances on own-revenue efforts.[8] Moreover, the incentives of local

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[1] Sub-national governments obtain revenues from different sources. In many cases they face constrains to define the tax rate or the tax base which distorts the incentives and the citizens' perceptions about them. Therefore it is better to count as own-source revenues only those with substantial autonomy from the upper levels of government. See Ambrosiano and Bordignon (2006). Joumard and Kongsrud (2003), Blöchliger and King (2006) and Blöchliger and Rabesona (2009) show that in many OECD countries there is an important difference between revenues with substantial sub-national autonomy and the figures obtained from the OECD or GFS databases.

[2] See Artana (2007) for an explanation of the problems of using GFS data for Argentina. Provinces accounted for about two thirds of the sub-national revenues (with autonomy) and for about 80% of the sub-national expenses.

[3] Local governments also receive a fraction of their province own-source tax revenues. See López Murphy and Moskovits (1998) and Sanguinetti et al (2001) for an analysis of the provincial revenue sharing schemes.

[4] See for example FIEL (1993, 2003), Fedelino and Ter-Minassian (2009), Weingast (2006), Nicolini et al (2002), Ahmad and Brosio (2008).

[5] See for example, FIEL (1993) and Tommasi (2002).

[6] See for example Saiegh and Tommasi (1999) and Tommasi (2002).

[7] See for example FIEL (1993) or Jones et al (1997).

[8] For example Jones et al (1999) found some evidence that provinces improved their collection of own-source revenues during the 1990's when they realized that the federal government had a tighter budget constraint imposed by the Currency Board. Baldrich (2010) estimated a two-period panel (1998 and 2002) with data of 22 Argentine provinces. His dependent variable are provincial own-source revenues (in absolute values and per capita terms) and his explanatory

politicians to deliver better public services and sound fiscal policies may be undermined not only by the size of the vertical imbalance but also by its composition (i.e. unlike automatic transfers, discretionary transfers provide the federal government with an instrument to influence sub-national decisions). And the composition of sub-national revenues matters too. Property taxes and user fees are more visible than other sources of local financing, such as the turnover sales tax.

During the last decade important changes took place. First, the country suffered a large economic crisis and an important rebound with six consecutive years of high growth (from 2003 to 2008), a novelty in a country with volatile growth.

Revenues became more centralized as a consequence of changes in the tax mix that favored the federal government,[9] and every year since 2003 the Federal Executive was able to pass a budget with an underestimation of revenues. With the use of emergency powers that were delegated by Congress to the Executive in 2002 (and renewed every year until 2010) the president was able to allocate the excess revenues at will. Therefore, discretionary transfers, that were 0.5% of GDP at the end of the 1990's increased to an average of 1.7% of GDP in more recent years.

There were also important changes in the revenues collected directly by the provinces. Resource-rich provinces enjoyed a windfall on the royalties they collect from domestic producers. In spite of government controls on the domestic price of petroleum and natural gas, royalties doubled in a decade (from 0.3% in 1997-99 to 0.6% of GDP in 2007-09).

Most provinces changed their own-source tax mix, reducing the taxation on property and increasing the revenues obtained from a turnover sales tax (even increasing tax rates in spite of the extra revenues that a booming economy produced). This may be a consequence of the difficulties to maintain the tax base of the real estate tax in real terms because of money illusion, or simply because they have other less-visible opportunities.

Tax revenues of the General Government are high in Argentina, not only compared with the average Latin-American country but also compared with its potential tax base.[10] However, most revenues are collected by the federal government creating a high vertical imbalance that may

variables are the ratio of Central Government transfers to Own-source Revenue, the GINI coefficient, the provincial GDP as a proxy of the provincial tax base and the size of each province (measured by their population). He found that own-source revenues increase when provinces have: a) a better distribution of income, b) a bigger GDP, c) more population, d) less dependence from Central Government grants.

[9] During the 2001-2002 macroeconomic crisis a tax on financial transactions and export taxes were reintroduced. Taxes on exports were not shared with the provinces until 2008 when a minor fraction of the collection from export of soybeans was distributed among the provinces. The federal government also receives a larger fraction of tax on financial transactions than from other taxes (about 70% compared to about 50%).

[10] See Artana and Templado (2010).

discourage revenue effort at the sub-national level and increases the odds of federal bailouts.[11] Mobilizing sub-national revenues would allow maintaining the same overall revenue effort but at the same time it would improve the provinces' incentives to deliver better services and reduce the odds of future bail outs. Therefore, reforms should focus more on efficiency and income distribution rather than on raising more revenues.

This paper is organized as follows.[12] In Section 2 we show the recent evolution of government revenues in Argentina and the vertical imbalance. Then we analyze from an economic perspective the most important taxes collected by the three levels of government. In section 3 we look at the determinants of sub-national revenues and explore the impact of the 2001-2002 crisis and of higher federal transfers on the size and composition of the provincial own-source revenues. We found that automatic transfers improve the collections of the cascade sales tax and the property tax by enlarging the disposable income of the private and public sector of the provinces favored by the regional redistribution of income, but discretionary transfers have a different impact: they reduce own-source revenue effort and encourage more public investment. This is consistent with the permanent income hypothesis and also with the attempt to protect the governor if the Federal government decides to cut the money transferred to the province.[13] Finally, in Section 4 we analyze different options to improve sub-national revenue mobilization in Argentina and we make some proposals to improve it with a special focus on alternatives to improve on the cascade provincial sales tax.

2. Argentina's tax system and its recent evolution

Table 1 shows the evolution of revenues and expenditures of the General Government, broken down by levels of government as estimated by the Ministry of Economy.[14] The data shows the large increase in the state participation in the economy (about 12% of GDP in the last decade) and some decentralization of expenses from the federal government to subnational governments: for example the share of the Federal government in total primary outlays declined from 56% in 2000 to 51% in

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[11] See Eichengreen and Von Hagen (1996).
[12] An earlier version of this paper includes an analysis of the political economy game and the efficacy of local tax administration agencies. See Artana et al (2012).
[13] From a political point of view, capital outlays are easier to reduce than current expenditures. It is also easier to raise own-source revenues rather than cutting the public sector wage bill if discretional federal transfers are reduced.
[14] Data for local governments is available until 2006. We projected the figures for 2009 assuming a similar growth rate of that observed between 2006 and 2009 for a provincial variable that tracks better what happened at the local level. For example: i) we use the evolution of the collection of the provincial tax on vehicles to estimate municipal own-source taxes because it accounts for the largest share of what is included as local government taxes; ii) non-tax revenues and figurative contributions were assumed to follow the same path than provincial transfers to local governments; iii) expenses were projected using the evolution of the similar expense at the provincial level (e.g. salaries were projected with the same growth rate observed in the provincial wage bill).

2009, that of the provinces increased from 36% to 39% and that of local governments increased from 9% to 10%. [15]

According to the Argentine Constitution, the federal government establishes and receives the revenues from taxes on trade (both on imports and on exports); the provinces collect direct taxes while indirect taxes are shared between both levels of government. However, the provinces may delegate the collection of direct taxes to the federal government, as has been the norm for many decades, and share the proceeds from direct and indirect taxes through a revenue sharing agreement. Each province is responsible for ensuring adequate revenue sources to its municipalities.

In practice, the federal government collects a large share of total taxes and then transfers a fraction of this collection to provinces that, in turn, transfer money to their local governments. In any case, in 2009, provinces and municipalities had own-sources of revenues for about 6.5% of GDP, out of total revenues of about 37.6% of GDP (see Table 2).[16]

As in most countries, tax revenues are the bulk of government revenues. During the 1990's tax revenues averaged about 22% of GDP. In 2009 they were 50% higher. Most of this change was obtained at the federal level by a combination of new taxes and increases in the effective tax rates. Provinces increased their collections of a turnover tax, but only to offset declining revenues from property taxes (Table 3).[17]

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[15] Official figures of revenues and expenditures have some shortcomings: a) some expenditures are not included. One notorious example is the provincial pension systems. Provinces include in current transfers the amount of money transferred to their pension systems to pay for their deficits, but do not show on a regular basis the total amounts spent in pensions and administrative expenses. Therefore, both revenues and expenditures are underestimated by an amount equal to the employer's and employees' contributions to the provincial pension systems. For 2009 these were 1.80% of GDP. Therefore, total provincial revenues were 13.32% of GDP instead of the 11.52% of GDP reported in Table 1 and total expenditures were 15.93% of GDP instead of 14.13% of GDP (the deficit of 0.3% of GDP is included in current transfers). Note that for the Federal public system there is not such a problem because all expenses are shown in the line of Social Security; b) Provincial and municipal taxes include the automatic transfers that the provinces and local government receive out of the revenue-sharing systems. For the purpose of our study it is necessary to show them separate of own-source taxes. This correction is done in Table 2 for the provinces; c) Own-source municipal taxes are included in non-tax revenues because they are named "user fees".

[16] Data on the composition of government revenues is not totally consistent with the data of Table 1, although the sources of information are different agencies of MECON.

[17] We show averages of three years to reduce the impact of one-off events. During 1997, 1998, 2007 and 2008 the economy was growing, while in 1999 and 2009 there was a recession.

Table 1 : Argentina: General Government (% of GDP)

	1993				2000			
	National Public Sector	Provinces and Buenos Aires City	Local Governments	TOTAL	National Public Sector	Provinces and Buenos Aires City	Local Governments	TOTAL
CURRENT REVENUES	**15.25%**	**7.64%**	**2.43%**	**25.33%**	**15.04%**	**8.51%**	**2.42%**	**25.97%**
Tax Revenues	13.64%	6.79%	1.19%	21.62%	12.94%	7.46%	1.07%	21.48%
Non Tax Revenues	1.57%	0.85%	1.25%	3.66%	2.10%	1.05%	1.34%	4.49%
Public Companies' Operating Surplus	0.04%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%
CURRENT EXPENDITURE	**12.83%**	**8.54%**	**2.37%**	**23.74%**	**15.38%**	**10.00%**	**2.47%**	**27.84%**
Consumption	3.33%	7.18%	2.27%	12.77%	3.25%	7.84%	2.33%	13.42%
Interest Payments	1.23%	0.20%	0.01%	1.44%	3.40%	0.66%	0.04%	4.10%
Social Security	5.99%	0.00%	0.00%	5.99%	6.16%	0.00%	0.00%	6.16%
Current Transfers	2.04%	1.17%	0.09%	3.30%	2.42%	1.49%	0.10%	4.02%
Other	0.23%	0.00%	0.00%	0.23%	0.14%	0.00%	0.00%	0.14%
Public Utilities' Operating Deficit	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.01%
CAPITAL REVENUES	**1.24%**	**0.25%**	**0.04%**	**1.53%**	**0.16%**	**0.19%**	**0.03%**	**0.38%**
CAPITAL EXPENDITURE	**1.19%**	**1.60%**	**0.46%**	**3.26%**	**0.31%**	**1.25%**	**0.32%**	**1.88%**
TOTAL REVENUES	**16.49%**	**7.89%**	**2.48%**	**26.85%**	**15.21%**	**8.70%**	**2.44%**	**26.35%**
TOTAL EXPENDITURE	**14.03%**	**10.15%**	**2.83%**	**27.00%**	**15.69%**	**11.25%**	**2.79%**	**29.72%**
Figurative Contributions	**0.00%**	**1.74%**	**0.22%**	**1.96%**	**0.04%**	**1.70%**	**0.28%**	**2.02%**
Figurative Expenditure	**1.74%**	**0.22%**	**0.00%**	**1.96%**	**1.70%**	**0.32%**	**0.00%**	**2.02%**
GLOBAL RESULT	**0.73%**	**-0.74%**	**-0.13%**	**-0.15%**	**-2.14%**	**-1.17%**	**-0.07%**	**-3.37%**
PRIMARY RESULT	**1.96%**	**-0.54%**	**-0.12%**	**1.30%**	**1.27%**	**-0.51%**	**-0.04%**	**0.72%**

	2004				2009			
	National Public Sector	Provinces and Buenos Aires City	Local Governments	TOTAL	National Public Sector	Provinces and Buenos Aires City	Local Governments	TOTAL
CURRENT REVENUES	**18.03%**	**9.23%**	**2.23%**	**29.49%**	**23.52%**	**11.35%**	**2.68%**	**37.55%**
Tax Revenues	16.48%	8.07%	1.13%	25.68%	13.58%	10.08%	1.50%	25.16%
Non Tax Revenues	1.55%	1.16%	1.10%	3.81%	9.94%	1.27%	1.18%	12.39%
Public Companies' Operating Surplus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
CURRENT EXPENDITURE	**12.30%**	**8.73%**	**2.11%**	**23.13%**	**20.40%**	**11.78%**	**2.77%**	**34.95%**
Consumption	2.99%	6.64%	1.94%	11.57%	4.19%	9.69%	2.57%	16.45%
Interest Payments	1.29%	0.37%	0.01%	1.67%	2.44%	0.30%	0.01%	2.75%
Social Security	4.80%	0.00%	0.00%	4.80%	7.48%	0.00%	0.00%	7.48%
Current Transfers	3.18%	1.72%	0.15%	5.05%	5.84%	1.79%	0.19%	7.82%
Other	0.03%	0.00%	0.00%	0.03%	0.26%	0.00%	0.00%	0.26%
Public Utilities' Operating Deficit	0.00%	0.00%	0.00%	0.00%	0.19%	0.00%	0.00%	0.19%
CAPITAL REVENUES	**0.05%**	**0.22%**	**0.01%**	**0.28%**	**0.13%**	**0.17%**	**0.10%**	**0.40%**
CAPITAL EXPENDITURE	**0.93%**	**1.80%**	**0.33%**	**3.05%**	**2.39%**	**2.35%**	**0.69%**	**5.43%**
TOTAL REVENUES	**18.08%**	**9.45%**	**2.24%**	**29.77%**	**23.65%**	**11.52%**	**2.78%**	**37.95%**
TOTAL EXPENDITURE	**13.22%**	**10.53%**	**2.44%**	**26.19%**	**22.79%**	**14.13%**	**3.46%**	**40.38%**
Figurative Contributions	**0.05%**	**2.30%**	**0.24%**	**2.58%**	**0.02%**	**2.13%**	**0.51%**	**2.66%**
Figurative Expenditure	**2.30%**	**0.28%**	**0.00%**	**2.58%**	**2.13%**	**0.53%**	**0.00%**	**2.66%**
GLOBAL RESULT	**2.60%**	**0.94%**	**0.04%**	**3.58%**	**-1.25%**	**-1.02%**	**-0.17%**	**-2.43%**
PRIMARY RESULT	**3.89%**	**1.31%**	**0.05%**	**5.25%**	**1.19%**	**-0.72%**	**-0.15%**	**0.32%**

Source: Based on MECON Investment and Saving Account of the General Government and Own Estimates for Local Governments and GDP for 2009.

Notes: 1/ Figurative expenditures are transfers from one level of government to finance expenses of another level. They are registered as figurative contributions in the recipient government.

Table 2: Argentina. General Government Revenues (% of GDP)

	1993	2000	2004	2009 3/	Variation 1993-2009	Contribution to the total variation 1993-2009
Taxes on Income, Profits, & Capital Gains	2.03%	3.98%	5.26%	5.24%	3.21%	27%
Taxes on Property	1.41%	1.62%	1.46%	1.36%	-0.05%	0%
Taxes on Goods and Services 1/	10.77%	11.16%	13.01%	15.27%	4.50%	37%
Taxes on International Trade	1.07%	0.73%	3.05%	3.68%	2.62%	22%
of which import duties	1.03%	0.70%	0.73%	0.71%	-0.32%	-3%
of which taxes on exports	0.01%	0.01%	2.29%	2.95%	2.94%	24%
Other Taxes	0.78%	0.59%	0.54%	0.48%	-0.30%	-2%
Total Taxes	16.05%	18.08%	23.32%	26.03%	9.98%	83%
Social Contributions to Public System	5.58%	3.40%	3.04%	7.11%	1.54%	13%
Social Contributions to Private pension funds	0.00%	1.48%	0.93%	0.00%	0.00%	0%
Total Taxes and Social Contributions	21.63%	22.97%	27.29%	33.14%	11.51%	96%
Other Revenues 2/	3.92%	4.63%	4.26%	4.45%	0.53%	4%
Total Government Revenues	25.55%	27.59%	31.54%	37.59%	12.05%	100%
Collected by:						
Federal Government	70%	64%	71%	75%	10.40%	86%
Provinces	15%	14%	13%	13%	1.11%	9%
Municipalities	5%	5%	4%	4%	0.09%	1%
Private Pension Funds	0%	5%	3%	0%	0.00%	0%
Other agencies	10%	12%	10%	8%	0.44%	4%

Notes: 1/ Revenues net of tax reimburses to exporters. Includes VAT, Excises, 100% of tax on financial transactions and provincial turnover tax
2/ Includes Grants and municipal revenues.
3/ 2009 Nominal GDP estimated by FIEL
Source: Authors' calculations based on DNIAF-MECON and FIEL.

Table 3: Federal and Provincial Taxes (% of GDP)

	Average 1997-99	Average 2007-09
Federal	17.10%	26.38%
VAT	6.66%	7.56%
Excises	2.03%	1.66%
Personal assets	0.21%	0.33%
Income tax	3.22%	5.30%
Social Security	3.67%	5.53%
Export taxes	0.01%	2.97%
Taxes on imports	0.90%	0.81%
Financial Transactions	0.00%	1.87%
Other	0.40%	0.33%
Provinces	3.87%	4.48%
Turnover sales	2.18%	3.24%
Real State	0.63%	0.38%
Automobiles	0.31%	0.26%
Other	0.75%	0.60%
Other Provincial Revenues		
Shared Federal Taxes	5.73%	6.79%
Federal transfers	0.50%	1.69%
Other Provincial Own Source Revenues	0.74%	1.03%
Royalties	0.29%	0.59%
Memo items		
Provinces Total Revenues	10.84%	13.99%
Provincial Expenditures	11.91%	14.92%
Provinces Deficit	1.07%	0.93%

Source: Author's calculations based on MECON

Revenue collections became more centralized, with the federal government increasing its share from 69-70% in 1993 or 2000 to 75% in 2009.[18] Provinces reduced their deficits but did not eliminate them in spite of the expansion of the economy. The average deficit that was 9% of expenditures at the end of the 1990's was cut to 6% in 2007-2009, but naturally some provinces had a deficit higher than the average, notably the emblematic province of Buenos Aires with a deficit that averaged 10% of its expenditures during 2007-2009.

The vertical imbalances increased modestly, but with important differences across provinces. For example, some oil-producing provinces that collect royalties reduced the vertical imbalance given the increase in the domestic prices of crude oil and natural gas at the producer level, while the five advanced provinces increased (modestly) their dependence from federal transfers.

The composition of provincial taxes changed with an important increase of the collections from the turnover sales tax and a reduction of taxes on property.[19] Although the tax bases are not the same, it is interesting to note that the collection of the provincial turnover tax as a share of the collection of the federal VAT increased from 33% in 1997/99 to 43% in 2007-09 at the same time that the provincial collection of taxes on property (real estate plus automobiles) was reduced from 307% as a share of the collection of the federal tax on personal assets in 1997/99 to 114% in 2007/09. This suggests that the change in the composition of provincial own-source taxes was a political decision rather than a consequence of alterations in the tax bases.

Provinces received more automatic transfers from the federal government through the different tax sharing agreements, but discretionary transfers multiplied by three (measured as % of GDP). Provinces have no important restrictions to spend the revenues obtained from tax sharing,[20] although there are some restrictions on the money received through discretionary transfers.

Unfortunately data for local governments is not updated.[21] The last available year with a complete data set is 2000 and only a few municipalities provide updated information in their web

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[18] Mandatory contributions to private pension funds were added to allow for a consistent comparison. Most workers opted to make contribution to private pension funds from mid 1994 to the end of 2008 when the government decided to nationalize them and forced all workers to contribute to the public pay-as-you-go system.

[19] A few small provinces transferred in the early 1990s the collection of taxes on real estate and automobiles to their municipalities.

[20] One exemption is the transfers for education and health that accompanied the second stage of decentralization of these services that took place in the early 1990's. However, as their value was fixed in nominal terms it has eroded substantially in real terms.

[21] Data for the municipalities of the province of Buenos Aires (see Table below) show that between 1997 and 2007 the collections of the provincial property tax increased 83% compared to a 71% increase for the property tax collected by local governments. In the same period, collections of the cascade sales tax soared at the provincial level and also at the municipal level (although not all municipalities use sales as the tax base of their taxes on business).

pages. Sanguinetti et al (2001) showed that there is an important diversity among the 23 provinces[22] in the share of local governments in the consolidated sub-national expenditures (from 8% to 32%). Their econometric analysis focused on the determinants of the large variation in per capita municipal expenditures. The main results were: a) higher transfers per capita lead to higher expenditures per capita (similarly to what was found in studies about the Argentine provinces), b) political variables had an impact (more decentralization of the local power reduces per capita expenditures), and c) the size of the local government, the economic activity or poverty had no impact on expenditures per capita. The authors did not explore the impact on own-source revenues.

The changes in federal and provincial revenues took place in a changing environment. The implosion of economic activity that followed after the default of the federal public debt, the large depreciation of the peso and the financial crisis of 2001-2002 encouraged the government to adopt emergency measures that increased centralization.[23] Centralization may have afforded an "insecure" political regime with leverage over sub-national governments.[24] Large exogenous shocks may change the relative bargaining power of the different levels of government and may change tax policies.[25] The 2001-2002 Argentine crisis is an example. It created a political vacuum that the 2003 presidential election could not fill immediately given that the elected president obtained only 22% of the votes. The economic recovery, the possibility to adopt emergency measures without Congress approval and the use of discretionary transfers allowed the government to gain political muscle later.

The 2001-2002 macroeconomic crisis also brought to an end several fiscal agreements that had been signed between the federal government and the provinces. In particular, provinces regained freedom to set the tax rates and tax bases of the turnover sales tax and abandoned the path of gradual

In Arg$ million	1997	2007	% change
Province of Buenos Aires Own-source tax revenues			
Total Tax Revenues	4.510.174	13.029.150	189%
Cascade Sales Tax	2.113.650	8.506.267	302%
Property tax	667.295	1.224.293	83%
Automobiles	484.631	804.095	66%
Other	1.244.598	2.494.495	100%
Municipalities of the Prov of Buenos Aires Own-Source Tax revenues			
Total Tax Revenues	1.744.141	3.716.093	113%
Cascade Sales Tax	323.770	1.007.760	211%
Property tax	878.815	1.504.162	71%
Other	541.556	1.204.171	122%

[22] The City of Buenos Aires has no local governments.
[23] Oates (1978) provided some evidence that in deep crises there is a tendency to centralize government responsibilities.
[24] Weingast (2006).
[25] Ambrosiano and Bordignon (2006).

reduction of tax rates on primary production and manufacturing that had been agreed in the early 1990's to reduce the cascade effect.[26]

2.a. Taxes collected by the federal government

The federal government is de facto responsible for collecting most taxes in Argentina. The taxation on consumption includes: a) a VAT of the consumption type at a general rate of 21% although some utilities are taxed at a higher rate of 27% for their sales to firms to piggy back on their collection effort, and some foods are taxed at 10.5%. Financial services are exempt as is customary in most countries; and b) special excises on the consumption of fuels, tobacco and beverages, most of them ad-valorem. The taxation of income flows and assets includes: a) a personal income tax on labor and capital income at a progressive rate (the top marginal rate is 35%). The minimum exempt level is about twice the per capita income which, unlike developed countries, takes the low medium-income families out of the income tax net; b) labor income is also taxed with social contributions that return some services to formal workers although most benefits are not a direct function of the tax paid by employers and employees. Therefore, they are a tax on labor income at a proportional rate; c) firms' profits are taxed at a 35% flat rate and dividends are exempt. There is no indexation for inflation. There is a 1% tax on business assets that is integrated to the business income tax (firms can credit it against their liabilities in the income tax). It acts as a minimum tax on income. There is a similar tax for individuals on their properties and some financial assets (*Impuesto a los Bienes Personales*), but it is a final tax that cannot be credited against the personal income tax. The rate structure for this tax on personal wealth is progressive and the marginal rate is 0.75%. Only mortgages are allowed to be deducted from assets.

Other taxes with important contributions to federal revenues are: a) a tax on financial transactions at a combined rate of 1.2%, with an exemption for deposits used to pay monthly salaries.[27] This tax is similar to a turnover tax. It distorts relative prices and penalizes domestic producers that cannot shift it to international prices; b) imports pay duties according to the common external tariff agreed on Mercosur. All exports pay taxes, but at different rates that go from 4.8% for manufacturing to 37.5% for soybeans. Exports taxes are a tax on production and a subsidy to local consumption.

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[26] The federal financial transaction tax that was reintroduced in 2001 falls on a similar tax base than the provincial cascade tax. This is an example of a tax externality not properly coordinated between the different levels of government.
[27] Both debits and credits into bank accounts are taxed at 0.6%. One third of the rate on bank credits can be used as a tax credit for income tax purposes.

With the exception of import duties and social security contributions, all revenues are shared with the provincial governments, but the primary distribution is different across taxes. It is lower for taxes on exports (only revenues received from exports of soybeans are shared with the provinces), and for the tax on financial transactions.

2.b. Taxes collected by Provinces and Local Governments

As founders of the federal government, provinces delegated the collection of some taxes but retained taxing power. Municipalities collect taxes and user fees, but most "fees" are hidden taxes because they are not related to the services provided. Most revenues are obtained from a tax on sales (that mimics in most cases the provincial tax) and from taxes on real estate (that mimic the provincial one).

Each province and most local governments have their own tax administration department or agency (either centralized or decentralized). Some provinces agree to share information with the federal tax agency, but there are no joint audits.

Table 4 shows the composition of provincial revenues in 2009 expressed as a fraction of the local GDPs.[28] Data for the provinces are also grouped according to their level of development and their population density. The importance of the state participation in the economy is negatively correlated with development and with population density. This is a consequence of the high regional distributional component of federal transfers that favors the poor and sparsely populated provinces. For example the automatic federal transfers averaged only 3.8% of the GDP of the advanced and populated provinces, but jumped to 26.52% of GDP for the poorest provinces with low density (column 12). On one extreme there was the City of Buenos Aires with total revenues of 6% of its GDP and on the other was Formosa with 59% of its GDP.[29]

There is much less variation in the collection of Own-source tax revenues (from 3.8% of GDP to 4.9% for the averages of the 4 groups). This is especially the case for the most important tax of the provincial governments, *Ingresos Brutos* (the cascade sales tax, with revenues that average 2.9% in the group of poor and sparsely populated provinces to 3.7% of GDP in the richer and highly populated provinces) and also for the stamp tax (with revenues of about 0.4% of the local GDPs in the four groups). Real Estate tax collections expressed as a fraction of the provincial GDPs are higher

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[28] The weighted average is estimated as the total collection in pesos of the 24 provinces divided by the nominal National GDP. The sum of the 24 provincial GDPs has minor differences with the estimate of the National GDP.
[29] Estimates of provincial GDPs are not as reliable as the estimate of the Federal GDP.

for provinces with high population density, suggesting that urban properties account for most of the collections of this tax.

Table 4: Provincial Revenues as % of Provincial GDP as of 2009														
	Cascade Tax	Real State Tax	Tax on Motor Vehicles	Stamp Tax	Other taxes	Total Own-Source Taxes	Royalties	Other Non-tax revenues	Total Non-tax revenues	Capital revenues and other	Total Own-source Revenues	Automatic Transfers	Discretional Transfers	Total Federal Transfers	Total Provincial Revenues
	1	2	3	4	5	6 = 1+2+3+4+5	7	8	9 = 7+8	10	11 = 6+9+10	12	13	14 = 12+13	15=11+14
Ciudad de Buenos Aires	3.55%	0.56%	0.43%	0.31%	0.06%	4.90%	0.00%	0.24%	0.24%	0.06%	5.20%	0.57%	0.12%	0.69%	5.89%
Buenos Aires	3.91%	0.36%	0.35%	0.34%	0.36%	5.32%	0.00%	0.21%	0.21%	0.10%	5.63%	3.80%	1.66%	5.45%	11.09%
Catamarca	1.75%	0.10%	0.16%	0.19%	0.00%	2.20%	0.68%	2.32%	3.01%	0.43%	5.64%	18.96%	1.51%	20.47%	26.11%
Córdoba	3.72%	0.43%	0.21%	0.24%	0.00%	4.59%	0.00%	0.71%	0.71%	0.27%	5.58%	7.80%	2.00%	9.80%	15.38%
Corrientes	1.59%	0.11%	0.00%	0.25%	0.00%	1.96%	0.10%	0.11%	0.21%	0.32%	2.49%	14.31%	1.49%	15.80%	18.30%
Chaco	3.08%	0.03%	0.00%	0.41%	0.69%	4.21%	0.00%	0.42%	0.42%	0.40%	5.03%	29.56%	11.98%	41.54%	46.57%
Chubut	2.74%	0.00%	0.00%	0.35%	0.09%	3.19%	6.49%	1.72%	8.21%	0.70%	12.10%	6.01%	1.81%	7.81%	19.91%
Entre Ríos	2.55%	0.64%	0.42%	0.38%	0.48%	4.47%	0.88%	0.25%	1.12%	0.46%	6.06%	15.32%	4.49%	19.81%	25.87%
Formosa	2.47%	0.04%	0.00%	0.33%	0.15%	2.99%	0.27%	0.70%	0.98%	0.30%	4.26%	45.75%	9.29%	55.04%	59.31%
Jujuy	2.40%	0.12%	0.00%	0.30%	0.21%	3.03%	0.02%	0.34%	0.36%	0.32%	3.70%	22.39%	11.44%	33.84%	37.54%
La Pampa	3.77%	0.99%	0.56%	1.03%	0.09%	6.45%	1.13%	0.64%	1.77%	2.37%	10.59%	19.67%	3.99%	23.66%	34.25%
La Rioja	2.10%	0.07%	0.27%	0.07%	0.00%	2.51%	0.00%	0.19%	0.19%	1.75%	4.44%	29.42%	15.90%	45.32%	49.76%
Mendoza	3.08%	0.37%	0.43%	0.48%	0.03%	4.38%	2.05%	0.86%	2.92%	0.50%	7.80%	8.57%	1.95%	10.52%	18.32%
Misiones	2.80%	0.14%	0.04%	0.26%	0.02%	3.25%	0.46%	0.25%	0.71%	0.40%	4.36%	11.98%	4.14%	16.12%	20.49%
Neuquén	3.24%	0.21%	0.00%	0.39%	0.00%	3.83%	7.37%	5.05%	12.42%	1.43%	17.68%	5.30%	1.24%	6.54%	24.22%
Río Negro	3.22%	0.24%	0.46%	0.36%	0.01%	4.29%	2.28%	0.90%	3.19%	0.33%	7.81%	12.20%	2.55%	14.75%	22.56%
Salta	4.65%	0.05%	0.00%	0.63%	0.33%	5.67%	2.93%	0.60%	3.52%	0.59%	9.78%	21.59%	4.86%	26.44%	36.23%
San Juan	2.80%	0.31%	0.40%	0.31%	0.64%	4.46%	0.60%	0.63%	1.22%	1.19%	6.88%	24.46%	4.89%	29.35%	36.23%
San Luis	3.94%	0.27%	0.20%	0.41%	0.03%	4.85%	0.00%	0.35%	0.35%	0.64%	5.85%	18.32%	1.80%	20.13%	25.98%
Santa Cruz	3.97%	0.01%	0.00%	0.57%	0.00%	4.55%	8.78%	1.71%	10.49%	7.54%	22.59%	10.75%	11.29%	22.04%	44.63%
Santa Fe	2.92%	0.32%	0.00%	0.48%	0.02%	3.74%	0.00%	0.12%	0.12%	0.30%	4.16%	7.35%	1.29%	8.64%	12.80%
Santiago del Estero	2.38%	0.20%	0.10%	0.37%	0.53%	3.58%	0.02%	0.32%	0.33%	0.59%	4.51%	30.40%	9.17%	39.57%	44.08%
Tierra del Fuego	3.39%	0.00%	0.00%	0.15%	0.84%	4.39%	3.15%	1.70%	4.85%	0.72%	9.96%	11.94%	3.17%	15.11%	25.08%
Tucumán	7.05%	0.89%	0.39%	0.92%	0.20%	9.43%	0.00%	0.97%	0.97%	0.68%	11.08%	25.85%	7.71%	33.57%	44.64%
High Development and High Population Density	3.65%	0.42%	0.33%	0.34%	0.19%	4.92%	0.09%	0.29%	0.37%	0.14%	5.44%	3.80%	1.21%	5.01%	10.45%
High Development and Low Population Density	3.33%	0.19%	0.13%	0.43%	0.10%	4.18%	5.06%	2.25%	7.31%	1.76%	13.26%	10.00%	3.17%	13.16%	26.42%
Low Development and High Population Density	3.08%	0.34%	0.16%	0.40%	0.25%	4.22%	0.33%	0.35%	0.67%	0.43%	5.33%	18.29%	5.85%	24.14%	29.47%
Low Development and Low Population Density	2.88%	0.14%	0.15%	0.36%	0.31%	3.83%	0.99%	0.85%	1.84%	0.75%	6.41%	26.52%	6.52%	33.04%	39.45%
Weighted average	3.53%	0.38%	0.29%	0.35%	0.19%	4.74%	0.59%	0.49%	1.08%	0.34%	6.16%	6.767%	2.06%	8.83%	14.99%
Simple average	3.21%	0.27%	0.18%	0.40%	0.20%	4.26%	1.55%	0.89%	2.44%	0.93%	7.63%	16.76%	4.99%	21.75%	29.38%
Coefficient of variation	0.344	1.004	1.068	0.547	1.290	0.361	1.630	1.202	1.384	1.615	0.612	0.633	0.866	0.642	0.469
Minimum	1.59%	0.00%	0.00%	0.07%	0.00%	1.96%	0.00%	0.11%	0.12%	0.06%	2.49%	0.57%	0.12%	0.69%	5.89%
Maximun	7.05%	0.99%	0.56%	1.03%	0.84%	9.43%	8.78%	5.05%	12.42%	7.54%	22.59%	45.75%	15.90%	55.04%	59.31%

High Development and High Population Density are: City of Buenos Aires, Buenos Aires, Cordoba, Mendoza and Santa Fe. High Development and Low Population Density: Chubut, La Pampa, Neuquen, Rio Negro, San Luis, Santa Cruz and Tierra del Fuego. Low Development and High Population Density are: Corrientes, Chaco, Entre Rios, Jujuy, Misiones and Tucumán. Low Development and Low Density are: Catamarca, Formosa, La Rioja, Salta, San Juan and Santiago del Estero.

Source: Authors' calculations based on Mecon and provincial Bureau of Statistics

i. The turnover tax (Ingresos Brutos)[30]

The Argentine provinces had used a tax on gross sales for years *(Impuesto a las Actividades Lucrativas)*. When the VAT was introduced in 1975 at the Federal level they agreed to eliminate the tax and this enabled them to receive a fraction of the collections of the VAT. However, under a new name *(Ingresos Brutos)* the cascade tax was reintroduced probably as a response to the high deficits that were pervasive at that time at all levels of government. In the early 1980's there was one failed attempt to reduce the cascade of the tax and in the early 1990's the Federal government provided some incentives to provinces to reduce the cascade under the umbrella of two Fiscal Agreements

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[30] This section is a summary of Artana et al (2011).

(1992 and 1993). Provinces were supposed to exempt primary activities, manufacturing, construction and financial services. About 60% of the provinces complied with the exemptions on primary activities, manufacturing and construction but only a few extended the exemptions to financial services. During the 2000's the Fiscal Agreements were abandoned and most provinces taxed those activities again.

Some provinces reduce the rates for small firms and grant other exemptions either for development reasons (e.g. manufacturing located in industrial zones) or for distributional purposes (e.g. lower rates on some foods, transport and medicines). The fiscal loss for these special regimes is substantial (e.g. about 23% of collections in 2010 in the province of Buenos Aires).[31]

The weighted average tax rate[32] increased from 1.60% in 2002 to 1.68% in 2010. Although there is a positive relationship between the rate and the collections, there are important differences in collections for relatively similar rates. This may respond to different exemptions that were not considered in the estimate of the weighted average tax rate or to differences in the enforcement of the tax (either differences in evasion or different contributions from the easier-to-collect sources like the money obtained from large taxpayers or from withholdings). The recent evolution of collections differed from one province to another. On one extreme, there is a group of 7 provinces (Buenos Aires, Chubut, La Pampa, Neuquen, San Luis, Santa Cruz and Tucuman) with large increases between 1993 and 2009 (over 90% of the growth observed in their GDPs), and on the other extreme, there are two provinces (City of Buenos Aires and Mendoza) with increase of less than 30% over GDP growth.

More recently, the distortions became even worse. For example:

- The dispersion in legal tax rates for the same economic activity among different provinces is important. Table 5 summarizes the findings of IERAL and IARAF, two institutions that estimate the effective legal tax rates of taxes on gross sales for the 24 provinces and a sample of municipalities.[33] It follows that there is a high dispersion across provinces of the rates for

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[31] The province of Buenos Aires estimates the fiscal loss of tax exemptions and reduced rates in own-source taxes. For 2010 in *Ingresos Brutos* 65% of the estimated loss came from the exemption granted to small and medium size firms and 35% from reduced rates and exemptions.

[32] The average rate for each province is estimated using the shares of each economic sector in the provincial Gross Domestic Product and taking into consideration the general exemptions (but not those exemptions granted to specific firms like those located in industrial parks). Therefore, the rates shown in Table 5 may overstate the rates charged in practice.

[33] These institutions follow since 2002 a sample of 100 municipalities that represent 60% of the population of the 23 provinces with local governments. Seventy percent of these municipalities have a tax on gross sales similar to the provincial tax. The other 30% uses the number of employees, the size of the shop or other criteria to calculate the tax.

primary activities, manufacturing and construction in the provincial tax on gross sales. For utilities, commerce and financial intermediation the dispersion is lower, but average rates are higher.

Table 5: Dispersion of Tax Rates in Provincial and Municipal Cascade Sales Taxes. By Economic Activity and Province in 2006										
	Primary		Manufacturing & Construction Located in Same Province		Utilities		Commerce, Restaurants & Hotels		Financial Intermediation	
	Provincial Turnover Tax	Municipal Tax	Provincial Turnover Tax	Municipal Tax	Provincial Turnover Tax	Municipal Tax	Provincial Turnover Tax	Municipal Tax	Provincial Turnover Tax	Municipal Tax
Average rate in 24 provinces	0.49%	0.47%	0.78%	0.39%	2.38%	0.69%	2.67%	0.90%	2.69%	0.85%
Minimum rate	0.00%	0.00%	0.00%	0.10%	0.60%	0.05%	1.60%	0.25%	0.00%	0.05%
Maximun rate	2.00%	3.40%	2.30%	1.40%	3.40%	2.60%	4.40%	2.10%	4.40%	3.00%
Coefficient of variation	1.27	1.54	0.97	0.77	0.31	0.88	0.22	0.48	0.39	0.85

Source: Authors' calculations based on IARAF (2009) and IERAL (2006).

- By increasing the tax burden on primary, manufacturing, construction and financial services that are used as inputs in other economic activities the cascade has surely increased. For example, the average rate on primary activities increased from 33% of the average rate of *Ingresos Brutos* in 2003 to 36% in 2010, and for manufacturing it rose from 50% of the average in 2003 to 60% in 2010.

- 21 of the 24 provinces have a higher tax on manufacturers that are located in other provinces than in manufacturers located on their territory. The difference in rates is substantial. For example in the province of Buenos Aires is 3% compared with 0,57%, in Cordoba 3,50% compared with 0,46%, in the City of Buenos Aires 3% compared with 0.63% and in Santa Fe 1,35% compared with 0%.[34] Provinces can enforce this through the *Convenio Multilateral* that distributes among provinces the collections of large taxpayers that have sales in more than one jurisdiction. The difference in rates increases the cost for a firm located in the province that purchases inputs in other provinces, and is a sort of internal barrier to trade because a firm "saves" in taxes by purchasing from local manufacturers.

- Withholdings became more pervasive.[35] There are over 60 different regimes for withholdings in the 24 provinces. As most of them are additive there is a non-negligible probability of

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[34] See IARAF (2010 a) that estimates that the weighted average tax rate for the 24 provinces for manufacturers located in other provinces more than doubles the rate for manufacturers located in the province.
[35] In 2010 withholdings accounted for 54% of total collections of *Ingresos Brutos* in the City of Buenos Aires and for 83% in the province of Buenos Aires. Firms paying through the Multilateral Agreement contributed with 38% in the

suffering chronic excess withholdings that provinces are reluctant to reimburse. Moreover, as the regional distribution of purchases is likely to be different from the regional distribution of sales, many firms may have a credit with some provinces although on the aggregate they may have a balanced position. Only a few provinces permit the transfer of excess withholdings to other taxpayers.

The fraction of provincial and municipal sales taxes that falls on the producers of tradables is better thought of as a tax on production given that Argentina is a price-taker in world markets. Therefore this fraction of the tax is likely to fall on income of labor and capital (including land). The tax that falls on the non-traded part of goods and services sold in the domestic market is a tax on consumption at variable rates that depend on the cascade and the value added by the different stages on non-tradable production. With information of collections by sector of some of the large provinces, it can be concluded that on one extreme retail activities (including services) with no cascade effect may account for about 30% of total revenues, on the other extreme primary activities and manufacturing with maximum cascade effect may account for about 20%, and the remaining 50% is obtained from services (financial, transport) or construction that have a mix of final sales and intermediate sales. Therefore, the cascade is a problem in the tax as most of its revenues are obtained from activities that are inputs of other activities.

ii. Tasa de Seguridad e Higiene

Most municipalities have a tax on gross sales that mimics the provincial turnover tax, although at lower rates (see Table 5). However, the dispersion in rates for the same economic activity is usually higher for the municipal tax than for the provincial tax.[36]

When municipalities opt to use another base[37], the tax (expressed as a percentage of sales) is usually lower.[38]

The weighted average tax rate for the municipalities that hit gross sales also increased from 0.58% of sales in 2003 to the above mentioned 0.67% in 2010.[39]

City and 13% in the province of Buenos Aires. Local taxpayers contribute with less than 10% of total revenues suggesting that most are small firms.

[36]But there is more uniformity across sectors e.g., the average tax rate for commerce is twice the rate of primary activities, while in *Ingresos Brutos* it is 5.4 times bigger.

[37] Generally number of employees or size of the shop where the activity takes place.

[38] Average estimates from IARAF (2010) are 0.23% of sales compared to 0.67% for the 70% municipalities that tax gross sales.

The economic analysis for the most frequent tax base is similar to the provincial tax on gross sales. When they opt to tax employment the analysis is similar to a tax on labor (likely to reduce formal employment and labor income in an open economy), and when they opt to use the size of the shop it looks similar to a tax on real estate (see below).

iii.   Taxes on urban and rural real estate

During the 1980's and 1990's some provinces shifted the collection on urban real estate and on automobiles to their local governments. All provinces calculate the tax on the assessed value of properties. In building the cadastre provinces usually rely on the characteristics of the property and their value. However, the valuation of old properties is not updated regularly, with the exception of their most visible characteristics.[40] Table 6 shows for selected provinces that the "typical" structure of the tax is: a) progressive rates for urban properties; b) unused urban land is taxed at higher rates; and c) tax rates on rural land are proportional in some provinces and progressive in others. There are subjective exemptions and also variations according to the location of the property. The tax on real estate in the most developed provinces is about 0.5% of market values.

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[39] The increase may be overstated because the figures for 2003 published by IERAL (2004) apparently bundle together all municipalities and it is likely that those using other bases than sales also had a lower rate at that time.
[40] A Federal Law (26209/07) was enacted creating the Cadastre Federal Council integrated by all the provincial cadastres (i.e. a single Cadastre for all the country), but no advancement was achieved yet.

Table 6: Structure of the Tax on Real Estate in Selected Provinces

	Urban properties with construction			Urban land			Rural land		
	Minimum rate on assessed value	Maximum rate on assessed value	Difference by zone (either by rate or valuation)	Minimum rate on assessed value	Maximum rate on assessed value	Difference by zone (either by rate or valuation)	Minimum rate on assessed value	Maximum rate on assessed value	Difference by zone (either by rate or valuation)
City of Buenos Aires /1	0.58%	2.16%	Yes	5.58%	10.58%	Yes	No rural land		
Province of Buenos Aires /2	0.38%	1.62%	Yes	0.38%	1.69%	Yes	1.01%	2.51%	Yes
Córdoba - Río Tercero /3 /4 /5	0.48%	0.94%	Yes	0.74%	1.32%	Yes	1.20%	1.20%	Yes
La Pampa /4 /5 /6	0.50%	1.40%	No	2.00%	2.00%	Yes	1.20%	1.20%	Yes
Neuquén /4	0.55%	1.62%	No	2.80%	2.80%	No	1.20%	2.50%	Yes
Santa Fe /4	0.49%	1.22%	Yes	na	na	na	0.65%	2.35%	Yes
Entre Ríos	0.60%	2.80%	No	3.80%	5.50%	No	0.80%	2.30%	No
San Luis /7 /8	0.60%	1.20%	Yes	1.80%	1.80%	No	0.90%	1.50%	No
La Rioja /5 /9	0.20%	0.70%	No	1.50%	1.50%	No	1.00%	1.00%	No
Misiones /4	0.60%	1.20%	Yes	1.50%	1.50%	Yes	1.20%	1.20%	Yes
Chubut /10	0.40%	0.40%	Yes	0.42%	0.48%	Yes	1.20%	4.80%	No
Río Negro /4 /11	0.51%	1.00%	No	1.01%	2.00%	No	0.51%	1.00%	No
San Juan /4	0.47%	0.75%	No	2.55%	3.00%	No	2.55%	3.00%	No

1/ Includes all contributions on real state: for street cleaning and public lighting, for repairing of streets and to expand the subway network. The combined rate cannot exceed 1% of market value.

2/ In order to establish the taxable base for Urban property tax, it showld be applied the coefficient of 0.9 on the assigned fiscal value.

3/ Cordoba establishes two separate property taxes, collected by the province and the municipalities. In Rio Tercero, properties located in corners contribute an extra 20%, considering the shorter frontage.

4/ For Urban properties with construction and Urban land, it has been set an annual minimum tax in La Pampa ($21), Neuquen ($25), Santa Fe ($10), Misiones ($5.5), Rio Negro ($37.5), San Juan ($25), Cordoba ($20) and Rio Tercero, Cordoba (between $17 and $

5/ For Urban properties with construction, it has been set a fixed additional amount in La Rioja (between $13 and $69) and Rio Tercero, Cordoba (between $ 3.5 and $11.5 for each frontside metre long). For Urban land, in La Rioja (between $13 and $87.5) an

6/ Awards for good contributor: deductions in between 5 and 10%, according to the number of years without breaches.

7/ Awards for good contributor: deductions in between 10 and 20%, according to the number of years without breaches.

8/ When improvements in properties, the rates on the increased tax base will be applied in 60% (urban land) and 80% (rural land).

9/ Properties with no fiscal valuation pay a flat tax of $37.5

10/ Taxing on rural land is power of the provincial government, and on urban land of the municipalities. A third category of land, denominated "urban enlarging and and valleys", provides aliquots of between 0.01 and 1.50%.

11/ A surcharge of 50% has been set on properties with absent owners.

Source: author's calculations based on provincial taxcodes

As happens in other Latin-American countries the collection of taxes on property is lower than the bills issued.[41]

Property may be taxed directly or indirectly through taxes on the income generated by it. In Argentina the imputed income from own houses is not taxed with the income tax. Therefore, taxing the stock of real estate may correct for this bias. Moreover, as the property tax usually falls on the value of the assets it is neutral with regards to the source of financing while the income tax has a bias towards debt.[42] However, as the property tax also falls on houses for rental and on business real estate there is no correction of the distortions. The Federal tax on personal assets also falls on the

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[41] See De Cesare and Lazo Martin (2008) for a review of property taxes in Latin America.

[42] In Argentina equity is taxed once and debt is virtually tax free because the returns of most forms of savings are not taxed at the savers level. In fact, as there is inflation of 20-25% debt-financed assets are de facto subsidized. See Atkinson and Stiglitz (1980) for a proof. Families can also deduct the interest paid on mortgages up to Arg$ 20.000 a year (about US$ 5.000).

value of these properties and the transaction of properties is usually taxed with the stamp tax. Table 7 summarizes the taxation on property in Argentina.

Therefore, the justification for the property tax[43] does not lie in a correction (albeit imperfect) of distortions in the taxation of property income. For an efficiency point of view, with the tax at the provincial level (with few exceptions) there is not much justification as a user fee either, at least for the large provinces.

Table 7: Taxation of property assets and their income in Argentina								
	Taxation of assets 1/		Taxation of income flow		Taxation of capital gains		Taxation of transactions	
	Debt-Financed	Equity-Financed	Debt-Financed	Equity-Financed	Debt-Financed	Equity-Financed	Debt-Financed	Equity-Financed
Own House	Tp + Tpf	Tp + Tpf	Subsidy with ceiling	No tax	Exempt	Exempt	Ts	Ts
House for Rental	Tp + Tpf	Tp + Tpf	Subsidy with no ceiling because of inflation	> Ty because of depreciation at historical cost	Exempt	Exempt	Ts	Ts
Business real state	Tp + Taf	Tp + Taf	Subsidy with no ceiling because of inflation	> Ty because of depreciation at historical cost	Ty on nominal change in value	Ty on nominal change in value	Ts	Ts
Agricultural land	Tp + Taf	Tp + Taf	Subsidy with no ceiling because of inflation	> Ty because of depreciation at historical cost	Ty on nominal change in value	Ty on nominal change in value	Ts	Ts
Notes: Tp: Provincial Tax on on urban land and buildings. Tpl: Provincial tax on rural land. Ts: Provincial Stamp tax. Ty: Federal Income tax. Tpf: Federal tax on Personal Assets. Taf: Federal Tax on Business Assets								
1/ The Tax on Business Assets is creditable with the tax on business income.								
Source: Authors's estimates								

The generalized use of a progressive-rate structure suggests the search for equity and fairness. However, by taxing only real estate assets and with different criteria by province, it is not evident that vertical and horizontal equity concerns are correctly addressed.

iv. Taxes on motor vehicles

Many countries tax the purchase of a motor vehicle, its registration and its use. A possible explanation for this combination of taxes is the attempt to mitigate the risk of climate change. In fact, European countries are moving towards differentiating the rates of tax according to carbon emissions[44] in order to encourage consumers to purchase more efficient vehicles.[45] For example, in Germany passengers cars registered after July 1, 2009 pay an annual tax of Euros 1.84 per every 25 cm3 of cylinder capacity, while cars registered before that date run by gasoline pay a tax of Euros

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[43] Sepulveda and Martinez-Vazquez (2009) make a comparative analysis of the advantages of collecting a property tax at the sub-national or at the national level of government.

[44] For a summary of car taxation in the EU see ACEA (2010).

[45] Fullerton and West (2002) proved that a single tax on gasoline use combined with a single tax per unit of engine size and a single subsidy to pollution control equipment are a first best policy if consumers are homogeneous. When consumers have different tastes (e.g. about engine size or driven miles) one would need a different tax rate for each consumer (which is not possible). In a second-best framework they prove that under plausible assumptions the tax on gasoline should increase and the tax on engines should decrease if consumers preferences for "miles" (i.e. driving more) are positively correlated with their preference for engine size (i.e larger engines), which is likely to be the case.

6.75 to 25.36 per 100 cm3 (those running on diesel pay about 100% more). In other European countries they either use a registration tax based on fuel consumption or cylinder capacity or on estimates of CO_2 emissions. Only five countries use the price as the base of the tax (Denmark, Finland, Malta, the Netherlands and Slovenia), but in four of them it is combined with some other of the criteria mentioned before. Taxes on ownership are usually based on cylinder capacity, CO_2 emissions or the weight of the vehicle (especially for commercial vehicles).

In Argentina, the tax on automobiles may reach almost 4% of the value of the car in the richer provinces (see Table 8), plus 1% for registration fee.[46] Some provinces charge a proportional tax on the value of the car and others have a progressive rate structure. Commercial vehicles are usually taxed at lower rates. Many provinces exempt old cars for equity reasons even though that contradicts fuel efficiency and environmental objectives.

The taxation of vehicles in Argentina has several problems. Taxing according to the value of the car is difficult to justify from an environmental point of view. Price is unlikely to be correlated with CO_2 emissions or fuel consumption, and while the size of the engine is likely to lead to a higher price, there are many other attributes that will be taxed by using the value of the car as the tax base. In fact, a higher price is usually associated with improvements in the quality of the car (e.g. safety); therefore, the Argentine tax will end being a tax on quality.

For the same reasons mentioned in the discussion about the real estate tax, using a tax on vehicles as an instrument to achieve an improvement in the distribution of income is questionable. A tax on all the taxpayers' assets (like the federal tax on personal assets) is surely better. Even worse, as the tax rates are different across provinces this creates another obstacle to horizontal equity.[47]

The lower taxation on commercial vehicles is difficult to justify for environmental reasons or for equity reasons, although it may have a rationale to avoid additional efficiency costs since commercial vehicles are an input of production. However, in the case of buses and trucks it adds to subsidized prices on urban transport that are pervasive in most Argentine cities.

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[46] Argentina has a centralized Register at the federal government that serves all provinces. For registration of a new vehicle the owner has to pay a fee of 1% of the market value of the car plus some lump-sum fees for the emission of the certificate that validates the ownership. The value of cars is updated regularly and is similar to the market price. When an old car is sold, the Register charges another 1% of the value of the car for the transfer of ownership.

[47] Some variation in rates may be accepted so that the sub-national governments have autonomy, but the differences that exist in Argentina on a mobile tax base like cars are relatively large.

Table 8: Structure of the Tax on Motor Vehicles in Selected Provinces (% of Market Values)

	Taxation of Passenger Cars			Taxation of Commercial Vehicles		
	Minimum Rate	Maximun Rate	Exemption for Old Cars	Taxis and Vans	Trucks	Buses
City of Buenos Aires 1/	3.52%	3.52%	Yes more than 12 years	2.53%	1.38%	1.27%
Province of Buenos Aires	3.00%	3.90%	Transferred to municipalities	3.00%	1.50%	1.50%
Cordoba	1.20%	1.50%	Yes, before 1998	1.20%	1.07%	1.07%
Mendoza	2.30%	2.90%	Pay minimum fee of US$ 12			
San Luis	2.50%	2.50%	Pay minimum fee according to weight	2.50%	1.25%	1.25%
Santa Fe	2.00%	2.00%	Pay minimum fee of US$ 3	0.50%	1.50%	0.50%
Tucuman	2.00%	2.00%		2.00%	1.00%	
La Pampa	2.00%	3.00%	Yes, before 1990	2.30%	1.25%	2.10%
Catamarca	2.00%	2.00%	Pay minimum fee of US$ 10	2.00%	1.50%	1.50%
Jujuy	1.00%	1.00%	Pay minimun fee of US$ 7	1.00%	1.00%	1.00%
Neuquén -San Martín de los Andes-	3.50%	3.50%	Yes, more than 20 years	2.30%	1.60%	1.60%
Entre Ríos	1.80%	2.30%	Pay minimum fee of US$ 7	2.00%	1.50%	0.50%
Misiones	2.00%	2.00%	Older than 16 years pay a minimum fee of US$ 5		0.80%	0.80%

1/ Includes a surcharge of 10% for the expansion of the subway network.

2/ Market values are estimated by the National Register based on information provided by insurance companies and car manufacturers.

Source: Authors' calculations based on provincial tax codes.

v. Stamp tax on some contracts

This is a cascade tax on some contracts that differs from one province to another. The City of Buenos Aires reintroduced the tax that it had abolished during the 1990's. In many provinces most revenues are obtained from real estate transactions and from financial and insurance contracts.

The 24 provinces collected in 2009 0.36% of the country's GDP, but in some provinces the collections (expressed as % of the local GDP) are much higher. For example, it was 1.03% in La Pampa, 0.9% in Tucuman and about 0.6% in Salta and Santa Cruz.

vi. Other revenues

Some provinces also tax labor or utilities' sales and the twelve provinces that did not transfer their pay-as-you go pension system collect labor taxes on public employees. All provinces and municipalities collect user fees, although it is not clear whether they are set on a cost-recovery basis. User fees are related to different services like the use of public cemeteries, court fees, road levies, driver licenses, traffic violations, etcetera.

Resource-rich provinces collect royalties from mining, electricity and the production of crude oil and natural gas.[48] Most revenues from royalties are obtained from the production of crude oil and natural gas. The rate used to be 12% on the value of production, but recently some provinces agreed on different rates in bilateral negotiations with private firms to extend the concessions. In mining, the royalty is usually 3%.

The collection of royalties should have minimum administration costs because it is relatively easy to monitor output while the incentives to underestimate prices at the well can be controlled by the provinces by looking at market prices. However, there have been some problems with the estimate of the price discount that lower-quality petroleum carries in the market. More recently, provinces have relied on private firms to audit the price and quantity declared by oil and natural gas companies.

Most provinces share the revenues obtained from royalties with their local governments with some regional distribution objective by allocating a fraction of revenues even to the municipalities that have no production.

Provinces and municipalities where oil and natural gas production takes place, also include oil companies into the net of their cascade sales taxes and the base is usually the same used for the computation of royalties.

3. The impact of the 2001-2002 crisis on the level and composition of provincial revenues

Previous studies[49] have found that the provincial cascade sales tax is more pro-cyclical than federal transfers. It is important to validate this result because it suggests that the problem of procyclical revenues may have aggravated in recent years due to the increase in the collections of this tax. If this were the case, a reform of own-source revenues or proposals to reduce the vertical imbalance would need to include tax bases less sensitive to the economic cycle, or to be tied with credible fiscal responsibility laws.

Own-source provincial revenues and its composition changed during the last decade. It is necessary to understand the main explanations for these changes to make proposals of reform.

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[48] Mc Lure (2003) argues that there are good economic reasons for oil revenues to be centralized: the tax base is volatile and usually concentrated in a few regions of the country, there might be a temptation to reduce other local taxes or to undertake unprofitable public investment, and the compensation of losses for dry holes is not easy at the local level. See also, Fidelino and Ter-Minassian (2009).

[49] See Sturzenegger and Werner (2006).

Provincial revenues depend on: a) local variables such as the evolution of the provincial economic activity and its structure, the degree of informality, poverty and income distribution; b) exogenous variables for the province such as the prices of natural resources (oil and natural gas, electricity), or automatic federal transfers that are calculated using a formula introduced in 1988 and that was never changed since then; c) political economy variables that influence the distribution of discretionary transfers among provinces, and d) local decisions, e.g changes in tax rates or the decision not to use the same effort to collect a tax.

For example, in the case of the property tax, in an inflationary context it is necessary to update the values (tax base) of the different properties to avoid a deterioration of revenues in real terms. This indexation of the tax base is automatic in other taxes, such as the cascade sales tax and the automobile tax. The adjustment might be costly (as in the "menu cost" literature) or it might be politically exhausting. For taxpayers, in general the property tax is more visible than the cascade sales tax; in addition changes in the property value have tax externalities, since the valuation is the basis for the tax on wealth at the national level; and finally, there might be political economy issues in provinces were property tax is shared with the municipal governments (i.e. the provincial government has to pay the political cost of changing the property value, but it will not appropriate all the benefits). In this context, governors and provincial congress might have opted not to make these "visible" changes and rely more on federal transfers or on "less-visible" taxes such as the cascade sales tax that is automatically linked to inflation and economic activity.

Another factor that might have affected the own-source revenue effort and the sub-national tax structure is the growing importance of discretionary transfers and the increase (in real terms) in royalties and automatic transfers. On the one hand, the increase in transfers increases sub-national government tax revenue as a share of local GDP for some provinces, because it allows the province to consume more (i.e. the provincial GNI is above its GDP) increasing the tax base for several taxes (such as cascade sales tax, automobile tax, real estate tax). Also important might be the nature of the transfer, whether it is automatic or discretionary, and whether it is interpreted as temporary or permanent.

On the other hand, transfers might distort the incentives of local governments to collect their own taxes, reducing their tax effort, particularly those that are more visible for the taxpayers and this can

be interpreted as a variant of the flypaper effect,[50] but related to the revenue effort, i.e., on the revenue side.

As regards the expenditure of sub-national governments, there is a vast literature analyzing the flypaper effect. This effect results when a dollar of exogenous grants-in-aid leads to significantly greater public spending than an equivalent dollar of citizen income (i.e. money sticks where it hits), Inman (2008). There has been a discussion in the literature whether this anomaly is due to econometric problems. The main concern is the misclassification of grants as exogenous aid (endogeneity of grants), that may produce biased estimators. The empirical literature on the flypaper effect is large, and in general when endogeneity issues are controlled for, the result holds, suggesting that the flypaper effect appears to be a real phenomenon.[51] The natural explanation of this effect is political economy or the recognition that own-source revenues create distortions and federal transfers do not (at least from the recipient government's point of view, Vegh and Vuletin, 2010).[52] Some authors argue that the effect could be a result of voters' asymmetric information or fiscal illusion (see for instance Courant, Gramlich and Rubinfeld (1979), Oates (1999), Filimon, Romer and Rosenthal (1982) and Hines and Thaler (1995)). Inman (2008) suggests that rather than an anomaly, the flypaper effect is best seen as an outcome of political institutions and the associated incentives of elected officials.

Following the analysis of Vegh and Vuletin (2010) as it is logical for sub-national governments to spend more from grants than from additional distortionary own-source revenues, it is also logical that some provinces may opt to use the transfers to finance a reduction of their own taxes to reduce distortions or political costs.[53]

Summing up, revenues and their composition may be affected by the size of federal transfers, by asymmetric responses to external shocks and political factors,[54] or by the need to reduce deficits.

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[50] Baldrich (2010) provides some evidence that this is the case in Argentina.

[51] For example, Dahlberg et al (2006) use a discontinuous element in one grant in Sweden to address the endogeneity problem and find evidence that there is a flypaper effect on the expenditure side but not on sub-national taxation. Acosta (2010) finds evidence of a flypaper effect in municipalities of the province of Buenos Aires, but the effect is lower when he takes into consideration the impact on the neighbor's decision.

[52] With data from Argentine provinces, and Brazilian and US states, Vegh and Vuletin (2010) provide some empirical evidence that there is no puzzle when one considers that raising local taxes is socially costly. It makes sense to spend more from intergovernmental transfers that have no efficiency cost than from local taxes. Their empirical evidence suggests that the flypaper effect is larger when local tax rates are higher.

[53] The Second Generation Fiscal Federalism stresses the importance of the incentives faced by local policymakers. See Weingast (2006).

[54] Rattsö and Tovmö (2002) find evidence for Denmark that local governments have asymmetric responses to shocks by raising personal income tax rates when there are negative shocks (but they find no similar effect on property tax rates).

The econometric analysis has to deal with the problem of endogeneity of the intergovernmental transfers. There is no such a problem with automatic transfers in Argentina because they are calculated using formulas that have no relationship with any economic variable and they are applied to revenues collected by the federal government from VAT, income taxes, excises and other taxes whose evolution has little to do with any provincial decision.[55] But there is a problem with discretionary transfers[56] that might depend on the bargaining power of the different levels of government.

Provincial characteristics differ in Argentina and this may affect their potential tax bases. For example, more developed provinces or high-growth provinces should be able to collect more revenue from taxes on property and also from the cascade sales tax; more transparency should reduce evasion in local taxes[57]; provinces differ in their economic structure with sectors that are more difficult to tax than others; income distribution and informality also differ across regions, etcetera. It is interesting to estimate whether each province is using most of its potential to collect its taxes.[58]

3.a. Estimates of the revenue elasticity

Sturzenegger and Werner (2006) argue that the elasticities of sub-national tax revenues to provincial GDP are very high in Argentina, higher than those of central government transfers. If this were the case, decentralization of tax revenues might increase revenue volatility. In particular, they find that sub-national revenues are strongly procyclical, where the tax component is uniformly more procyclical than the resources obtained from national sources (transfers). Among the taxes it is *ingresos brutos* the one with the highest degree of procyclicality, while property taxes, as expected,

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They also find some evidence that socialist local governments rely more on property taxes than center-right local governments. Higher vertical imbalances may also provide more incentives to engage in corruption, and the composition of own-source revenues also matters. For example, Schleifer and Vishny (1998) conclude that local governments in Poland are more supportive of business and growth than in Russia because they rely more on revenues from property taxes, local taxes and fees more related to the growth rate of the region and this provides incentives for local policymakers to foster growth instead of rent-seeking.

[55] Artana et al. (2010) provide some evidence that the improvement in the terms of trade and the increase of the Brazilian economy in US$ accounted for 50% to 75% of growth experienced in Argentina from 2003 to 2008. External factors had a key role in the growth performance of the country during this period.

[56] Discretionary transfers are not new in Argentina's federalism. Nicolini et al (2002) found evidence that the ATN (Aportes del Tesoro Nacional) acted as an insurance to shocks during the period 1983-1997.

[57] Govinda Rao (2006) argues that many poor countries lack clear property rights and this reduces the potential revenues of the "prime candidate" for sub-national taxation. It is possible that delays in the distribution of property titles have affected the collection of property taxes in some Argentine provinces.

[58] For a discussion of what explain the cross country variation in revenues see Artana and Templado (2010). Gordon and Li (2009) and Keen and Simone (2004) provide some theoretical insights of why revenues and their composition differ across countries. Kenney and Winner (2006) provide an insight from a political economy point of view.

have very little relation with the business cycle. Their estimations are based on a provincial panel for the period 1992-2002.

Following a similar approach to Sturzenegger and Werner (2006) we estimate Income Elasticities of Revenues as:

$$(1) \qquad \log(y_{it}) = \beta_0 + \beta_1 \log(GDP_{it}) + u_i + \varepsilon_{it} \qquad\qquad i=1\ldots N \quad t=1\ldots T$$

where y are different measures of provincial revenues, *GDP* is the provincial GDP (both measured in real terms) and u is a (provincial level) fixed effect. The fixed effect captures average differences between provinces. We are interested in the size of β_1, what we called the revenue elasticities. These are not exactly income elasticities, because revenues are affected by the multiple changes in tax rates and tax bases. To control for the changes is complex, because there have been many changes in the 20 year time-window we analyze, some of them difficult to identify empirically (such as administrative changes with impact on revenues).

Table 9 shows the results for the period 1993-2009. The first regression in column (1) considers Total Provincial Revenues as the dependent variable and includes sub-national taxes, transfers from Central Government and Non-tax revenues (of which, the most important are royalties) as explanatory variables. The second column removes royalties from the explanation, showing that the procyclical behavior of revenues is not related to this component. Column (3) takes into account only sub-national tax revenues, and column (4) only the Central Government Transfers, showing that both dependent variables have similar elasticities (own-tax revenues have a slightly higher elasticity but it is not significantly different from the elasticity for transfers). Column (5) and (6) break own-tax revenue of provinces in the cascade sales tax (5) and other taxes (6) showing that pro-cyclicality comes from the cascade sales tax.

Table 9. Income Elasticities of provincial revenues
(Provincial) Fixed Effect Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Provincial Total Revenues	Provincial Own Tax Revenue+ Transfers	Provincial Own Tax Revenues	Total Transfers	Cascade sales Tax Revenue	Other (than Cascade sales) Provincial Tax Revenue
Log(GDP)	1.387***	1.334***	1.405***	1.373***	1.738***	0.768***
	(34.89)	(31.16)	(27.53)	(27.86)	(31.05)	(8.32)
Constant	-4.922***	-4.553***	-6.861***	- 5.207***	-10.09***	-2.676***
	(-14.64)	(-12.57)	(-15.90)	(-12.49)	(-21.32)	(-3.43)
Observations	408	408	408	408	408	408
R-squared	0.761	0.717	0.664	0.67	0.716	0.153
F	1217.2	970.8	758	776.1	964.4	69.29

Notes:
t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 10 computes GDP elasticities for each of the main components of local tax revenues and for central government transfers. As in Sturzenegger and Werner (2006) we find a very low elasticity for property tax and a high elasticity for cascade sales tax. Unlike Sturzenegger and Werner, we open the elasticity for Central Government transfers in the two main components, finding a coefficient close to 1 for automatic transfers and a very high elasticity for discretionary transfers.

Elasticities might have changed in the 2000s compared to the 1990s. Simple scatter diagrams show clear differences only for Property Tax and Discretionary Transfers. To test whether the differences are statistically significant we estimate the same fixed effect model but including slope and constant dummies to distinguish the 1990s from the 2000s (dummy taking 1 for the period of Convertibility 1993-2001). The coefficient for slope dummy can be interpreted as the increment (or decrease if negative) in the elasticity value for the 1990s compared to the 2000s. Table 11 presents the results for these elasticities. The results are consistent with the scatter diagrams: overall provincial revenue elasticity (including or excluding royalties) has not changed significantly. The income elasticity of Central Government Transfers has increased and the elasticity of Provincial Own-tax Revenue has decreased in the 2000s compared to the 1990s, reversing the result found by Sturzenegger and Werner: in the 2000s transfer elasticities have become more elastic than own-tax

revenue. The decline in the elasticity of Provincial Tax Revenues is explained by property tax and the stamp tax, since for the cascade sales tax there is not a significant change in the elasticity. For central government transfers, the increase is significant for both, automatic and discretionary transfers, although the largest change is clearly in the discretionary transfers.[59]

Table 10. Income Elasticities of provincial taxes
(Provincial) Fixed Effect Estimation

	(1)	(2)	(3)	(4)	(5)
	Sub-national Main Taxes			Transfers	
	Stamp Tax	Property Tax	Cascade sales Tax	Discretionary	Automatic
Log(GDP)	0.805***	0.199***	1.738***	3.057***	1.205***
	(6.47)	(2.76)	(31.05)	(16.46)	(27.34)
Constant	-4.053***	1.414**	-10.09***	-21.82***	-3.930***
	(-3.87)	(-2.27)	(-21.32)	(-13.89)	(-10.54)
Observations	379	306	408	408	408
R-squared	0.106	0.026	0.716	0.414	0.661
F	41.91	7.633	964.4	270.9	747.5

Notes:
t statistics in parentheses
* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Finally, if we include in the analysis a dummy for the year 2002, which was the year of the structural break (exit of Convertibility and large economic crisis) all the estimated elasticities are lower and the 2002 dummy is significant in all the regressions, indicating that revenues decrease more than usual in that year. For example, for total transfers the elasticity is reduced from 1.382 to 1.151 and for the cascade sales tax, from 1.53 to 1.249.[60]

Summing up, the empirical evidence suggests that the cascade sales tax is pro-cyclical, but the elasticity using the entire period, or the one found by Sturzenegger and Werner that uses the period 1992-2002, is upward biased due to the structural break. Controlling for the break tends to reduce the estimated elasticity. Also important is the fact that sub-national tax revenues are not more pro-

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[59] The constant dummy we include in each regression captures the average change in the tax burden in the 1990s compared to the 2000s. The main changes are in discretionary transfers and property tax revenues

[60] Results are available from the authors.

cyclical than central government transfers (they were in the 1990s, although the differences were not statistically significant, and the situation is reversed in the 2000s).

Table 11.A. Income Elasticities of provincial revenues. 1990s vs 2000s
(Provincial) Fixed Effect Estimation

	Provincial Total Revenues	Provincial Own Tax Revenue+ Transfers	Provincial Own Tax Revenues	Total Transfers	Cascade sales Tax Revenue	Other (than Cascade sales) Provincial Tax Revenue
Entire Period	1.387	1.334	1.405	1.373	1.738	0.768
2000s	1.274	1.312	1.297	1.382	1.530	0.822
1990s	1.263	1.291	1.338	1.292	1.532	0.932
Significance of the difference			**	***		***

Table 11.B. Income Elasticities of provincial taxes. 1990s vs 2000s

(Provincial) Fixed Effect Estimation

	Sub-national Taxes			Transfers	
	Stamp Tax	Property Tax	Cascade sales Tax	Discretionary	Automatic
Entire Period	0.805	0.199	1.738	3.057	1.205
2000s	1.251	0.390	1.530	2.530	1.280
1990s	1.361	0.454	1.532	2.069	1.227
	**	***		***	***

Notes: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Different elasticities for the subperiods are obtained though slope dummies.

3.b. The impact of federal transfers on provincial taxes

In this section we explore the determinants of the tax structure, and in particular we are interested in the role of federal government transfers. The stylized fact we want to explain is the change in the tax structure at provincial level observed in Argentina in the 2000s, where cascade taxes have gained weight and other taxes (particularly property taxes) have lost, at the same time that central government transfers became more discretional. Two hypotheses consistent with this structural change are: i) sub-national governments reduced tax pressure on more visible taxes (property tax) and/or ii) inflation (inexistent in the 1990s) has favored taxes that are automatically indexed to inflation. Critical to the argument is the role of central government transfers; if they affect the local government own-source revenue effort, there is a sort of flypaper effect. If transfers distort local

incentives, we should observe that provinces with larger increase in transfers distort their behavior the most.

The econometric model is:

$$(2) \qquad y_{it} = x_{it}\beta_k + \delta t_{it} + u_i + \varepsilon_{it} \qquad\qquad i=1\ldots N \quad t=1\ldots T$$

where y_{it} is either a measure of sub-national government effort (tax pressure) or a measure of tax structure, x_{it} is a vector of provincial characteristics, t_{it} are central government transfers and u_i are provincial specific effect (uncorrelated with ε_{it}, but could be correlated with x_{it} or t_{it}). Central Government transfers in Argentina comprise two elements: automatic transfers, which are exogenous (determined by rules not linked to the cycle), and discretionary transfers, which are endogenous. Endogeneity contaminates the estimation of the parameters in the fixed effect OLS estimation. An alternative is to use Instrumental Variables which requires valid instruments.[61] We propose two instruments, related with political economy issues: (i) Deputies' overrepresentation and (ii) Senators' overrepresentation (defined as ratio of the number of national deputies/senators to the provincial population).[62][63]

First we analyze the tax structure, where our dependent variable is the share of the turnover tax (CT) and the share of property taxes (PT) on sub-national tax revenues. The CT is the most important tax for most of the provinces, representing on average 67% of the own-source taxes; PT, on the other hand, represents on average just 10% of tax collection, the rest is explained by the stamp tax, automobile tax and other minor taxes.

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[61] The two conditions for a valid instrument z are: it has to be correlated with the endogenous variable and it has to be a valid exclusion in the original equation (i.e. not affecting the variable *y* directly). A special concern when using instrumental variables is the presence of weak instruments (low partial correlation of z with x); therefore, as suggested in the literature, we will pay special attention to the first stage, and check robustness with alternative methods to the IV estimators (such as Limited Information Maximum Likelihood (LIML) estimators, which are more robust to weak instruments).

[62] We explored a third instrument: Color of Party, defined as the coincidence or not of the provincial government party with the national government (classification done based on the opinion of political experts consulted) but it fails as an instrument.

[63] Our two instruments do have variation on time, although most of the explanatory power comes from the cross section variation. The province with the largest increase in overrepresentation shows a change between 2009 and 1993 of 21%, whereas the highest decrease is -27.7%. The two instruments explain between 20 and 35% of the cross section variation between provinces in discretionary transfers (OLS regression year by year). In a fixed effect model for the entire period, the overall R^2 is 0.27, with 0.43 for the R^2 between variation and 0.12 for the R^2 within variation.

Table 12 presents the results for the estimation of equation (2) by fixed effect. There is clearly a pattern: the fall in property tax share is associated to an increase in the central government transfers (as a share of local GDP), and to an increase in the inflation rate. Royalties have not a significant effect on tax structure. It is interesting to note that discretionary and automatic transfers tend to have the same sign. Table 13 reports the Instrumental Variable (IV) Fixed Effect Model estimations with similar qualitative results (although some parameters become not significant).

Table 12: Tax Structure. Fixed Effect Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	PT Share	CT Share	PT Share	CT Share	PT Share	CT Share
log(DT/GDP)	-0.0163***	0.0404***	-0.00916***	0.0228***	-0.00587***	0.0127***
	(-8.36)	(9.16)	(-4.56)	(5.12)	(-2.88)	(2.87)
log(AT/GDP)	-0.0369***	0.0133	-0.0270***	-0.0109	-0.0253***	-0.00951
	(-3.99)	(-0.64)	(-3.14)	(-0.57)	(-3.02)	(-0.52)
log(Roy/GDP)	-0.00707***	0.0130**	-0.0000421	-0.00423	0.0000593	-0.00508
	(-2.87)	(2.34)	(-0.02)	(-0.78)	(0.03)	(-1.01)
Log(GDP)			-0.0709***	0.173***	-0.0341***	0.0763***
			(-8.19)	(9.03)	(-3.37)	(3.47)
Provincial Inflation Rate					-0.0160***	0.0339***
					(-5.22)	(5.07)
Dum90s					0.00048	-0.0166*
					(0.12)	(-1.87)
Constant	-0.0981***	0.965***	0.601***	-0.747***	0.334***	-0.0168
	(-3.71)	(16.18)	(6.77)	(-3.79)	(3.50)	(-0.08)
Observations	408	408	408	408	408	408
R-squared	0.262	0.226	0.373	0.362	0.434	0.448
F	45.12	37.01	56.46	54	48.34	51.12

Notes:
t statistics in parentheses, * p<0.10, ** p<0.05, *** p<0.01
log(DT/GDP)= log of Discretionary Transfers as a ratio of provincial GDP
log(AT/GDP)= log of Automatic Transfers as a ratio of provincial GDP
log(Roy/GDP)= log of Royalties as a ratio of provincial GDP
Dum90s= 1 for 1993 to 2001

The results show that:

- economic activity and inflation increase the share of the cascade tax in own source tax revenue but reduce the share of the property tax, as expected given that the tax base of the cascade tax is associated to the size of the nominal GDP, while property taxation needs costly

(and visible for the taxpayer) adjustments in the valuation of properties only to maintain its purchasing power in real terms.

- Discretionary transfers increase the share of the cascade tax and reduce the share of the property tax while automatic transfers have no statistical significant effect on the share of the cascade tax but reduce the share of the property tax in some specifications of the model (column (1) in Table 13 and columns (1), (3) and (5) in Table 12). This evidence is consistent with the hypothesis that the "windfall" of discretionary transfers is partially used to reduce the share of the most visible property tax.[64] On the other hand, automatic transfers do not affect the tax structure, consistent with the idea that, because they are anticipated, they are incorporated in the budget process of each province.

- The dummy that takes a value of 1 in the 1990's and 0 otherwise is significant only for the cascade tax in Table 12 but with the expected sign in all the specifications: there was an upward drift in the collections of this tax after the economic crisis. In the instrumental variable specification the dummy is not significant in all the cases

- The collection of royalties has an effect in the same direction of automatic transfers in column (1) and (2) of Table 12, but once provincial GDP is included as a regressor, royalties become non significant.

The tax structure does not necessarily show the tax effort. To measure tax burden we use the tax collection of the cascade sales and the property taxes as fractions of the provincial GDPs (both measured in logs, in order to have elasticities as our parameters of interest). Hausmann endogeneity test (using the Deputies and Senators overrepresentation as instruments) indicates that Discretionary Transfers are endogenous; therefore we report only the results for the instrumental variable estimators.[65]

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[64]However, the estimated coefficients suggest a moderate to low effect. To see this, consider for instance the unweighted average discretional transfers for the entire sample (2.36% of GDP) and the average share of cascade tax (67% of total own source revenues). An estimated coefficient 0.028 implies that an increase in one percentage point of GDP in discretional transfers (i.e. increasing transfers from 2.36% to 3.36%) implies an increase in the share of cascade tax of one percentage point that is an increase in the share of CT from 67% to 68%.

[65] Deputies and Senators overrepresentation variables explain on overall 27% of the variation in the ratio of Discretional Transfers to GDP, and pass the Cragg-Donald test of weak instruments. Also according to Kleibergen-Paap rk LM statistic, the null hypothesis of under-identification is rejected at 1% significance level.

Table 13: Tax Structure. Instrumental Variable (IV) Fixed Effect Estimation

	(1)	(2)	(3)	(4)
	PT Share	CT Share	PT Share	CT Share
log(DT/GDP)	-0.0155***	0.0197	-0.0171***	0.0283**
	(-2.72)	(1.58)	(-3.09)	(2.41)
log(AT/GDP)	-0.0201*	-0.00753	-0.0127	-0.0269
	(-1.92)	(-0.33)	(-1.23)	(-1.22)
log(Roy/GDP)	-0.000363	-0.00439	-0.000666	-0.00407
	(-0.15)	(-0.81)	(-0.28)	(-0.79)
Log(GDP)	-0.0589***	0.179***	-0.0247**	0.0633***
	(-4.42)	(6.15)	(-2.20)	(2.65)
Provincial Inflation Rate			-0.0148***	0.0322***
			(-4.62)	(4.71)
dum90s			-0.00488	-0.00914
			(-1.00)	(-0.89)
Observations	408	408	408	408
F	32.77	30.08	23.99	35.96

Notes:
t statistics for robust standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.01
log(DT/GDP)= log of Discretionary Transfers as a ratio of provincial GDP
log(AT/GDP)= log of Automatic Transfers as a ratio of provincial GDP
log(Roy/GDP)= log of Royalties as a ratio of provincial GDP
Dum90s= 1 for 1993 to 2001

Table 14 shows the main results.[66]   Real GDP and inflation rate at provincial level affect tax effort in the same direction that they affect the tax structure: they reduce the tax pressure of Property Taxes but increase the tax pressure of Cascade Taxes. The dummy variable comparing 1990s and 2000s shows that tax pressure (at the same level of transfers, GDP and inflation) was smaller in the 1990s than in the 2000s. Finally, in terms of Central Government transfers we find an asymmetric response: Discretionary Transfers tend to reduce the tax pressure on both property and cascade taxes (the effect is larger for the property tax, consistent with the previous finding of a reduction in its share on local tax revenue), whereas Automatic Transfers increase both.[67] This apparent

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[66] Since some provinces have delegated the property tax to municipalities, our property tax revenue figure might be measured with errors for these cases. To control for this, we run the models also excluding these provinces (Chubut, Formosa, Salta, Santa Cruz, Tierra del Fuego), the sign and magnitude of the estimated coefficient do not change, but the model using PT as dependent variable fits much better, suggesting measurement errors is not contaminating our estimates but increasing standard errors (results are available from the authors).
[67] The negative effect of Discretionary Transfers is positive if we do not control for endogeneity (just fixed effect estimations). Since:

contradictory effect needs to be explained in more detail. Discretionary Transfers seem to work as a free lunch, reducing the effort. On the other hand, the finding that automatic transfers do not affect tax structure but increase the tax pressure might be related with the fact that most provinces receive more automatic transfers than what they contribute to the revenue pool.[68] This regional redistribution of income helps to improve the standard of living (at least for some parts of the population) and to increase consumption, favoring the collection of property taxes and the cascade sales tax.

Table 14. Tax Structure. IV Fixed Effect Estimation

	(1) PT /PBI	(2) CT /PBI	(3) PT /PBI	(4) CT /PBI	(5) PT /PBI	(6) CT /PBI
log(DT/GDP)	-0.173	-0.177**	-0.231*	-0.154***	-0.239**	-0.149***
	(-1.25)	(-2.52)	(-1.94)	(-3.20)	(-2.05)	(-3.75)
log(AT/GDP)	0.592**	1.060***	0.920***	0.738***	1.039***	0.674***
	(2.06)	(7.25)	(4.21)	(8.36)	(4.77)	(9.07)
log(Roy/GDP)	-0.0435	0.102***	0.0526	-0.00828	0.0432	-0.0092
	(-0.81)	(3.75)	(1.02)	(-0.40)	(0.85)	(-0.53)
Log(GDP)			-0.742***	0.911***	-0.509**	0.273***
			(-2.67)	(8.13)	(-2.14)	(3.37)
Provincial Inflation Rate					-0.244***	0.196***
					(-3.59)	(8.50)
Dum90s					-0.258**	-0.0695**
					(-2.52)	(-1.99)
Observations	408	408	408	408	408	408
F	2.553	29.05	15.29	57.12	13.31	70.75
Anderson canon. corr. LM statistic	29.828	29.828	48.438	48.438	55.235	55.235
Cragg-Donald Wald F statistic	16	16	19.9	19.9	31.67	31.67
F	2.553	29.05	15.29	57.12	13.31	70.75

Notes:
t statistics in parentheses, * p<0.10, ** p<0.05, *** p<0.01
log(DT/GDP)= log of Discretionary Transfers as a ratio of provincial GDP
log(AT/GDP)= log of Automatic Transfers as a ratio of provincial GDP
log(Roy/GDP)= log of Royalties as a ratio of provincial GDP
Dum90s= 1 for 1993 to 2001

$$plim\hat{\beta}_{OLS} = \beta + \frac{cov(x,e)}{var(x)}$$

the results suggest that cov(x,e) is positive what implies discretionary transfers work in practice more like conditional than compensatory transfers in Argentina (unobserved effort in tax collection is compensated with additional transfers). Using instruments for automatic transfers (falsification of the endogeneity assumption) do not change the results of the estimated coefficient for this variable, what suggests the instruments are working well.

[68] Excluding the City of Buenos Aires that demands a deeper analysis because the federal government pays part of the local services, there are 17 out of 23 provinces that have a lower share on the country's GDP than their share in automatic federal transfers. If an estimate of the wage bill is used, the figure raises to 21 out of 23 provinces. Only province of Buenos Aires (to a large extent) and Chubut are the net payers to the rest of the provinces. If we exclude these two provinces from our regressions the elasticity of automatic transfers increase, suggesting part of the explanation is due to this effect.

3.c. The Effect of Federal Transfers on Provincial Expenditures

In this section we analyze the other side of the same coin: expenditures. We used the same specification but using as dependent variable the log of provincial total expenditure and log of provincial capital expenditures (both as a share of the provincial GDP). Table 15 shows the results without controlling for endogeneity, where both types of transfers and the royalties have positive elasticities. Table 16 controls for endogeneity of the discretionary transfers, showing how the coefficient changes (ie, were formerly contaminated by endogeneity). In particular, the positive effect on total expenditures turns negative now, although it is close to zero (elasticity of -0.07), whereas the elasticity of automatic transfers is still positive and high at 0.73. This shows that discretionary transfers are not used to increase total expenditures, but as shown above they decrease own-source revenue effort. For capital expenditures we find a positive result suggesting that a fraction of discretionary transfers are used for capital expenditures, but not for current expenditures.

The results suggest provinces react differently to the central government transfers, depending on the nature of the transfer. Automatic transfers are consumed and, at the same time, they increase the tax bases of some provincial taxes easing higher revenues. This reaction is consistent with a permanent income shock. But discretionary transfers are seen as temporary income.[69] Provinces use part of them to increase capital expenditures and another part to reduce own taxes. This reduction may be reversed later if the political game (or shortages of funds) force a reduction for the discretional amounts received from the Federal government. This is a particular type of the "flypaper effect".

Our empirical findings are important for a proposal to improve sub-national revenue mobilization. It would be better to rely less on discretional transfers, but they are better replaced by the allocation of more tax bases. If they are converted into automatic transfers they are likely to increase government expenditures with no reduction in the vertical imbalance.

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[69] Unlike consumers, provinces have no incentive to save the temporary income (the discretional transfers) because this may trigger a retaliation of the Federal government reducing the amounts transferred in the future. Saving in a provincial fund has no immediate political benefits, while the inauguration of infrastructure programs may be appealing to politicians of all levels of government. At the same time, provinces may try to finance current expenditures with more permanent sources of revenues to avoid a higher dependency from the Federal government in the future.

Table 15. Sub-national Expenditure: Fixed Effect Estimation

Dependent variable: log expenditure on GDP

	(1) Capital Exp.	(2) Total Exp.	(3) Capital Exp.	(4) Total Exp.	(5) Capital Exp.	(6) Total Exp.
log(DT/GDP)	0.107***	0.0346***	0.04	0.0345***	0.0721**	0.0427***
	(3.68)	(4.00)	(1.22)	(3.59)	(2.21)	(4.62)
log(AT/GDP)	1.346***	0.665***	1.251***	0.665***	1.147***	0.601***
	(9.82)	(16.29)	(9.33)	(16.10)	(8.57)	(15.81)
log(Roy/GDP)	0.0628*	0.01	(0.00)	0.01	0.01	0.02
	(1.72)	(1.04)	(-0.11)	(0.97)	(0.17)	(1.60)
Log(GDP)			0.676***	0.00	0.768***	(0.07)
			(5.02)	(0.02)	(4.75)	(-1.50)
Provincial Inflation Rate					0.113**	0.116***
					(2.29)	(8.30)
Dum90s					0.277***	0.153***
					(4.25)	(8.29)
Constant	0.41	7.028***	-6.259***	7.020***	-7.369***	7.278***
	(1.05)	(60.11)	(-4.53)	(16.49)	(-4.82)	(16.78)
Observations	408	408	408	408	408	408
R-squared	0.291	0.496	0.335	0.496	0.365	0.592
F	52.04	125.2	47.8	93.66	36.22	91.22

Table 16. Sub-national Expenditure: IV Fixed Effect Estimation

Dependent variable: log expenditure on GDP

	(1) Capital Exp.	(2) Total Exp.	(3) Capital Exp.	(4) Total Exp.	(5) Capital Exp.	(6) Total Exp.
log(DT/GDP)	(0.06)	-0.0663*	0.10	-0.0658**	0.144*	-0.0706**
	(-0.56)	(-1.84)	(1.09)	(-2.15)	(1.68)	(-2.47)
log(AT/GDP)	1.627***	0.835***	1.189***	0.775***	1.067***	0.727***
	(7.23)	(11.13)	(7.36)	(13.81)	(6.66)	(13.61)
log(Roy/GDP)	0.0911**	0.0284**	(0.00)	0.01	0.01	0.01
	(2.18)	(2.04)	(-0.04)	(0.47)	(0.29)	(0.77)
Log(GDP)			0.568***	0.190***	0.708***	0.03
			(2.77)	(2.66)	(4.06)	(0.44)
Provincial Inflation Rate					0.105**	0.128***
					(2.11)	(7.70)
Dum90s					0.311***	0.0995***
					(4.13)	(3.97)
Observations	408.00	408.00	408.00	408.00	408.00	408.00
R-squared	0.23	0.32	0.33	0.35	0.36	0.43
F	43.8	89.4	47.3	71.47	35.42	63.76

3.d. Are provinces exploiting their tax bases?

It is interesting to analyze whether provinces are exploiting adequately their tax bases. There are different alternatives to do the analysis. One option is to use Stochastic Frontier Analysis (SFA). This technique was used for production functions and more recently it was adapted to revenue effort.[70] This is akin to our Data Envelope Analysis for provincial tax authorities (See Artana et al., 2012), a process that is advisable when there are many "inputs" that influence the "output" and it is not clear which is the "production function" that links them. In this analysis, each province would be compared to the "efficient frontier".

Another option is a Regression-Based model where each province is compared with the average provincial tax effort. Both techniques have the problem that a departure from the frontier or the average may be a provincial decision to have a lower tax burden or the consequence of inefficiencies in collecting taxes. But given the information that we have and the purpose of the analysis we prefer a Regression-Based model for the following reasons:

- the SFA estimates the parameter of inefficiency from the errors in the equation. In our case there are heteroskedasticity, spatial correlation and autocorrelation that are better addressed with a Regression-Based model. The use of Panel-corrected standard error corrects the variance-covariance estimation in order to account for these assumptions failure. Such correction (especially for the spatial correlation) has been not developed yet in the context of SFA

- The SFA was originally designed for production functions where it is easier to include all inputs that affect production. When used to analyze the performance of tax revenues it is likely that many "inputs" will be missing for lack of information. More specifically, "inputs" related to tax administration are crucial in a SFA analysis because the main purpose of the exercise is to detect deviations from an efficient performance. In a regression-based analysis there is no attempt to separate a decision to collect more taxes because the society prefers a lower size of government from a lower collection due to a poor tax administration.[71]

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[70] Pessino and Fenochietto (2010) use this technique at the national level.
[71] Esteller-Moré (2003) provides an example of the amount of information that is necessary to include, especially with regards to tax administration, which is not available for a panel of Argentine provinces.

- In the case of fixed-effect panels, SFA is subject to the "incidental parameter problem"[72] that affects the consistency property of the parameter estimations.[73] Some exercises to address this problem have been developed in recent years.[74] Moreover, the application of this recommended transformation does not protect the estimations from the particular error structure that we have in the data

We use as dependent variable Total Tax Revenues Per Capita of each province. As explanatory variables we use: Local GDP per capita, Deposits as percentage of local GDP, years of education of the population over 16 years, poverty index, the share of the agro-industrial activities on the GDP, Royalties, Mining (as share of local GDP) and the automatic transfers of the central government to each province.[75]

Table 17 shows the results for different alternatives. As expected, income, automatic transfers, deposits, years of education (except the last years where the sign is reversed and significance is lost) have all coefficients that are positive. Royalties are negative but statistically insignificant. Poverty has the negative expected sign and is also significant. The agro-industrial and mining shares both show negative relations with tax collection, however mining shows a stronger relation. Two dummy variables were tried: one that captures the pre and post convertibility period,[76] and another for the year 2002 to capture the impact of the economic crisis.

The results of equation (5) (excluding the variables that are non-significant at 10%) are used to estimate revenue bands for each province and for each year. As of 2009 Catamarca, Formosa and Tucuman were collecting more than projected according to their characteristics; Chubut, San Luis and Santa Cruz were converging to the forecasting interval after some year of "excess" revenues; and Entre Rios and Santa Fe were collecting less than projected while Cordoba was converging after

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[72] See Greene, W.H. (2005).

[73] As Wang and Ho (2010) comment on "true fixed-effect" model for SFA proposed by Greene: *"For a fixed-effect model, the number of fixed-effect parameters (also called incidental parameters since their values are usually not of direct interest) increases with the number of individuals (N). In this situation, the conventional asymptotic result, which relies on N→∞, cannot be applied and estimates of the incidental parameters are necessarily inconsistent for a fixed T (number of observations per individual). For many estimators, inconsistency may also contaminate the estimates of the model's other parameters; the issue is referred to as the incidental parameters problem…. For instance, for linear models with normal errors, the maximum likelihood estimator (MLE) of the slope coefficients is still consistent, but that of the variance-covariance matrix is inconsistent…"*

[74] See Wang and Ho (2010) and Chen et al (2011).

[75] The justification to include automatic transfers is that they increase the tax base of provincial taxes in most provinces.

[76] This dummy is 0 from 1993-2001 and 1 from 2002 to 2009.

some years of "low" revenues. The difference is relatively high for Entre Rios and Santa Fe with a shortage of about 15%.[77]

Table17: Local revenues determinants (Panel-corrected standard errors used)[78]

Dependant variable: Total Provincial tax revenues per capita					
	Eq. 1	Eq. 2	Eq. 3	Eq. 4	Eq. 5
log(Prov. GDP in real terms pc)	0.750***	0.588***	0.591***	0.585***	0.912***
	(0.074)	(0.0733)	(0.0751)	(0.0776)	(0.115)
Log(Automatic transfers / Prov.GDP)	0.328***	0.237***	0.235***	0.232***	0.179***
	(0.0561)	(0.0574)	(0.0573)	(0.0576)	(0.06)
Log (Deposits/ Prov. GDP)	0.110***	0.0563***	0.0574***	0.0549***	0.0458**
	(0.0226)	(0.0207)	(0.0209)	(0.0209)	(0.0201)
Log (years of education)	0.482**	0.00947	0.0135	0.0347	-0.112
	(0.236)	(0.261)	(0.262)	(0.266)	(0.264)
Poberty	-0.949***	-1.188***	-1.188***	-1.189***	-0.911***
	(0.137)	(0.158)	(0.159)	(0.16)	(0.167)
Log(Royaties / Prov. GDP)			-0.00344	-0.00253	
			(0.0106)	(0.0108)	
Agroindustrial (Share of Prov. GDP)				-0.0328	-0.762*
				(0.33)	(0.393)
Mining (Share of Prov. GDP)					-1.121***
					(0.3)
d2002		-0.151***	-0.150***	-0.153***	-0.153***
		(0.0293)	(0.0293)	(0.0297)	(0.0287)
Convertibilty Dummy		0.162***	0.162***	0.164***	0.146***
		(0.0276)	(0.0276)	(0.0279)	(0.0274)
Constant	-12.96***	-11.04***	-11.16***	-11.14***	-13.92***
	(0.765)	(0.87)	(0.968)	(1.009)	(1.185)
Observations	325	325	325	320	320
Standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

4. Priorities for reform

In every country there are trade-offs to reform sub-national revenues and even opposing views depending on the use of normative or positive theories.[79] These trade-offs may differ from one

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[77] This may be a consequence of a decision to have lower taxes rather than a problem of efficiency. For example, Entre Rios and Santa Fe have relatively low weighted average rates in the Cascade Sales Tax in Figure 2, and relatively low tax rates on automobiles in Table 7. Santa Fe also has a relatively low tax rate on urban properties in Table 5. But they also show inefficiencies in their tax administration (see Artana et al., 2012).

[78] The model estimated shows evidence of heteroscedasticity, contemporaneously correlation, and autocorrelation. The use of Panel-corrected standard error seems the most plausible estimation at this point. Fixed effects were captured with the inclusion of dummy variables for each province, these parameters estimation are not shown in the table for simplicity.

country to another but are particularly relevant for Argentina because political economy issues blocked previous proposals to reform both federal transfers and sub-national own-source revenues.[80]

When making proposals to improve sub-national revenue mobilization we have to take into account some general restrictions for a tax reform and some particularities of Argentina. For example:

- For most (if not all) tax handles there are important trade-offs to accomplish the multiple objectives that are expected from the tax system (minimum distortions, support the efforts to improve income distribution, minimum compliance and administration costs and revenues for the government). When political economy factors are added this is even worse because some "bad" taxes may be valuable for politicians if they provide the government with important revenues and are not visible to the average voter.

- Usually, existing taxes are more accepted than new ones to the extent that some "learning by doing" is necessary.

- Improvements in the efficiency of tax administration in Argentina face some limitations from inflexible labor rules that protect their employees, even those that are not efficient.

- Both the General Government tax burden and the vertical imbalance of provinces are high in Argentina. Therefore, it would be advisable to raise own-source provincial revenues at the same time that the federal tax burden is reduced. One easy way out is a reduction of discretionary transfers but this would likely find a resistance of the Federal government that use them to "control" powerful governors or to "buy" votes in the Congress.

- However, the analysis of previous sections shows that a reduction of discretionary transfers will improve own-source revenues, and that an eventual replacement by automatic transfers will be a bad alternative: it will not reduce the vertical imbalance, it will aggravate the perception that there is a soft budget constrain, and it will motivate an increase in government expenditures even though it is not evident that there is a need for that.

- The timing for a reform is probably not appropriate. Fiscal deficits at the provincial level are small and are being financed mostly by the federal government, there are no strong leaders besides the President of the country, and all levels of government have paid little

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[79] For example, Ambrosiano and Bordignon (2006), Fedelino and Ter-Minassian (2009), Ahmad and Brossio (2008).
[80] The political gridlock is evident: the 1994 reform of the Argentine Constitution mandated that a new Revenue Sharing regime should be enforced after 1996. So far no changes were agreed.

attention to the problems of the actual tax system. In fact, they have moved in the opposite direction by raising the share of the cascade sales tax at the expense of the property tax at the provincial level and at the federal level by maintaining "bad" taxes that were supposed to be temporary sources of financing to a government strapped for funds, even though that is no longer the case (e.g. the tax on financial transactions).

In this context we can think of reforms that are more ambitious (with lower chances of success) and other less ambitious that look more feasible, like the improvement of existing taxes.

On the more ambitious front we think that there is a lot to gain from replacing the Cascade Sales Tax by a provincial VAT that shares the same tax base than the federal VAT (to ease its administration), but allowing each province to set its rate inside a band that will be agreed among all provinces. To guarantee that provinces will not go back to cascade taxation, it would be better to include a restriction to do that under the new (and postponed) revenue sharing among the federal government and the provinces.

The Retail Sales tax has some disadvantages compared with a VAT. For example, all revenues are obtained from retailers that in Latin-American countries may be more difficult to audit. If the retailer is able to evade the government loses all revenues while with a VAT it still collects some money from manufacturing. Moreover, it is difficult to tax only retail sales. Slemrod and Bakija (1996) quote empirical evidence from US states that show that about 40% to 50% of the revenues correspond to intermediate sales. The advantage of the retail sales tax is that exports are tax free while with the VAT they might be de facto taxed (in spite of being zero-rated by Law) by delaying the reimbursement of the VAT credits.

But a provincial VAT has some problems, too. To minimize distortions it has to be a tax on final consumption. One option is to tax inter-provincial sales, but this requires that the province where the consumption is made reimburses the firms for all the VAT credits paid (including those paid to other provinces). Some provinces may be reluctant to reimburse the tax paid to other provinces, especially if they are strapped for funds. However, in Argentina, if provinces were ready to accept a similar tax base as the Federal VAT it would be possible to adopt a clearing house of VAT credits because the provincial VATs will be added to the invoice together with the Federal tax. This will provide other

source of information to reduce tax elusion and the possibility to include the Federal government as an arbiter in the clearing house.[81]

Another option is to zero-rate interprovincial sales. The problem of carousel fraud that has affected the European Community is likely to be less severe given the existence of a Federal VAT.[82]

An eventual replacement of *Ingresos Brutos* by a less distortionary tax (Provincial VAT or Retail Sales tax) would need to solve complex political economy problems. The impact on the personal and regional distribution of income might be different. To estimate the impact on the regional distribution of tax revenues we need to estimate the regional source of the Federal VAT tax collection. This will provide us with an approximation of the revenues that each province would perceive if they decide to replace the cascade tax with a piggy back on the Federal VAT (or with a retail sales tax with similar exemptions and reduced rates than the VAT).

The Federal VAT has a general rate of 21%, but some goods (usually food) are taxed at 10.5% and many goods and services are exempt. The best proxy of the tax base is Consumption. As this macroeconomic aggregate is not available at the geographical level, we estimated the shares of each jurisdiction by utilizing labor income (salaried and not salaried) from the Households's Permanent Survey (Encuesta Permanente de Hogares, INDEC). In addition, it is necessary to distinguish goods taxed at different rates from exempt goods. Using the shares of each good and service in the expenditure survey we simulated the weighted average tax collection. To distribute it among the 24 provinces we used the shares on the National Households' Expenses Survey (Encuesta Nacional de Gasto de los Hogares) 1996/97 baskets, the last one available with the required disaggregation. On average, a surtax of 7.1% of the Federal VAT would be required to ensure the same revenues of the cascade tax but there are important differences by province. For example, there are 6 provinces that may match the actual collections with a surcharge rate lower than 6% (compared to the average 7.1%) and there are other 6 provinces that need rates higher than 9% to maintain the collections.[83] Most of the winners are poor provinces that receive large transfers from the rest of the country (i.e. these are provinces with large "current account deficits"), and about half of the losers are oil-producing provinces that will lose this easy-to-tax base when the taxation is shifted from production

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[81] The Federal government has to intervene in foreign trade. For imports the situation is not much different to the withholdings of *Ingresos Brutos* that is made at Customs and sent later to each province. For exports the Federal government is already reimbursing the VAT credits on the Federal VAT and could do the same for the provincial VATs. If this were the case the Federal government will be one actor of the clearing house.

[82] Bird (2007) mentions that in the Canadian case a Federal VAT provides more guarantees.

[83] These are rough estimates because they ignore changes in compliance.

to final consumption. Among the large provinces, the city of Buenos Aires would lose with the change reflecting the important contribution of financial services and of large firms under the Multilateral Agreement that have offices (and expenses) in the City. Mendoza and province of Buenos Aires are modest gainers from the change.

Unlike the Cascade Sales Tax that is not visible for consumers, both taxes on consumption have the advantage of being transparent to the end user. However, provincial rates that fluctuate inside an ample band are likely to create problems (at least for border transactions), and are complicated from a political point of view. Therefore, it is likely that some compensation will be necessary for the losing provinces that should be financed from the rest of the country. This is possible through amendments in the secondary distribution of the revenue sharing arrangement, but it is likely to be very demanding and probably request a complete overhaul of the system that is unlikely to be approved.

A replacement of the turnover by a provincial VAT will not reduce the vertical imbalance, but may open a window to do that if the federal VAT rate is also reduced to allow the provinces to have a higher provincial rate.

Another option is to allow the provinces to introduce a surtax on some excises like those that fall on fuels or even to transfer part of the tax power of the Federal government.

A less-ambitious proposal is to improve the turnover by reversing some of the bad decisions that complicated the administration of the tax in recent years. This will require an agreement like the ones signed in the early 1990's under the umbrella of the revenue sharing system for it to be credible (and with financial penalties to the provinces that do not comply). It is possible that some of the needed counter reforms have Constitutional support (e.g. the use of higher rates on manufacturers located in other provinces may be interpreted as a barrier on domestic trade that is forbidden by the Constitution). The elimination of some problems (like chronic excess withholdings) may be achieved if provinces agree that controversies with taxpayers have to be solved by an interprovincial Court (similar to the solution of disputes under the Convenio Multilateral) but with a more important role for impartial judges rather than the participation of the Ministries of Economy of each province that is used today under the *Convenio*.

If primary activities and manufacturing are exempt from the tax and there is some coordination in the taxing of financial intermediation and transport, the cascade will be reduced substantially.[84]

With respect to taxation of real estate it is possible to use a National Cadastre (as proposed in 2007 but that has not been working so far) to improve on some of the pitfalls observed in recent years. In a more comprehensive reform the National Cadastre will be the only one responsible for the valuation of properties in all the country. This Cadastre may be "owned" by the 24 provinces but will be less subject to local political interference by being accountable to the 24 governors and the Federal government. A National Cadastre can use the same criteria to value property in all the country and impose a minimum correction for inflation.[85] Provinces may undo the final effect of this decision on their voters by reducing the tax rate, but an external valuation will eliminate the fiscal externality that today encourages some provinces to underestimate the value of properties: for many properties the Federal government uses the fiscal value as the base of the tax on personal assets. To avoid a windfall benefit for the Federal government it may reduce the rate of the federal tax for the properties located in the provinces that agreed to participate in the National Cadastre. This will be an incentive for provinces to adhere to the reform.

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[84] It would be better to extend the exemption to financial activities and transport but as they are important sources of revenue for some provinces this proposal is unlikely to receive much support.
[85] A permanent assessment of the market value of properties is very expensive. Therefore, some general indexation of the tax value is necessary even with an efficient cadastre.

References

ACEA. 2010. (European Automobiles Manufactures Association). *ACEA Tax Guide*.

Acosta, P. 2010. "The "Fly-Paper" Effect in the Presence of Spatial Interdependence: Evidence from Argentinean Municipalities". *Ann Reg Sci*. 44. 453-466.

Ahmad, E. and G. Brosio. 2008. "Political economy of multi-level tax assignments in Latin American countries: earmarked revenues versus tax autonomy". IMF Working Paper. WP 71.

Ambrosiano, M. and M. Bordignon. 2006. "Normative versus Positive Theories of Revenue Assignments in Federations" in E. Ahmad and G. Brossio (Eds) *Handbook of Fiscal Federalism*. Northampton Massachusetts. Edward Elgar Publishing Inc.

Artana, D. 2007 "Are Latin-American Countries Decentralized? FIEL Working Paper. Marzo.

Artana, D. and I. Templado. 2010. "Is the Argentine Revenue Effort "too" High? FIEL Working Paper No. 106. November.

Artana, D., E. Bour, J. Bour and N. Susmel. 2010. "Strengthening Long-term Growth in Argentina". Paper prepared for the OECD Economic Development and Review Committee (EDRC) Seminar "Beyond the Crisis – Returning to Sustainable Growth in Latin America". Paris. France. November.

Artana, D. S. Auguste, M. Cristini and C. Moskovits. 2011 "The Cascade Sales Tax in Argentina. Options for Reform". Paper prepared for the IADB (mimeo). June.

Artana, D. S. Auguste, M. Cristini, C. Moskovits and I. Templado. 2012. "Sub-national Revenue Mobilization in Latin America and Caribbean Countries: The Case of Argentina". FIEL Documento de Trabajo No. 109. Enero.

Atkinson, A. and J. Stiglitz.1980. *Lectures on Public Economics*. Mc Graw Hill.

Auguste, S. 2006. "Los costos de cumplimiento del sistema tributario". En FIEL *La presión formal sobre el sector formal de la economía*. Buenos Aires.

Bahl R. and M. Cyan. 2011. "Tax assignment: does the practice match the theory?" *Environment and Planning C: Government and Policy* 29(2) 264 – 280

Baldrich, J. 2010. "Taxing Our Neighbors? Why Some Sub-national Revenues Are so Small". Universidad de San Andrés, Marzo.

Bird R. 2007. "Is a State VAT the Answer? What's the Question? International Tax Program. University of Toronto. TP Paper 0703.Toronto, Ontario.

------- 2008. "Tax Assignment Revisited". IBB Paper No. 17. Rotman School of Management, University of Toronto. August.

------- 2010. "Sub-national Taxation in Developing Countries – A view of The Literature". The World Bank. October.

Bird R., F. Vaillancourt and E. Roy-Cesar. 2010. "Is Decentralization "Glue" or "Solvent" for National Unity?" International Studies Program, Working Paper 10-03. Georgia State University. February.

Blöchliger H. and D. King. 2006. "Less than You Thought: The Fiscal Autonomy of Sub-central Governments". OECD.

Blöchliger H. and J. Rabesona 2009. "The Fiscal Autonomy of Sub-central Governments: An Update". OECD Network on Fiscal Relations Across Levels of Government. WP 9.

Borge L. Rattso J. 2004. "Spending Growth With Vertical Fiscal Imbalance: Decentralize Government Spending in Norway 1880-1990". Nowegian University of Science and Technology.

Brosio, G. and J.P. Jiménez. 2010. "The intergovernmental assignment of revenue from natural resources: a difficult balance between centralism and threats to national unity", CEPAL, Santiago de Chile.

Chen, Y; P. Schmidt and H. Wang. 2011. "Consistent estimation of the fixed effect stochastic frontier model". Michigan University. August.

Courant, P., E. Gramlich, and D.. Rubinfeld, 1979. "The Simulative Effects of Intergovernmental Grants: Or Why Money Sticks Where It Hits." In P. Mieszkowski and W. Oakland, ed. *Fiscal Federalism and Grants-In-Aid*. Washington, DC: Urban Institute, pp. 5-21.

Dahlberg, M., E. Mörk, J. Rattso and H. Agren. 2006. "Local Taxes and Spending: Estimating the Flypaper Effect Using a Discontinuous Grant Rule" (mimeo).

De Cesare C. and J. Lazo Martin. 2008. "Impuestos a los patrimonios en América Latina". CEPAL. Serie Macroeconomía para el Desarrollo No. 66. Mayo.

Eichengreen, B., and J. von Hagen. 1996. "Federalism, Fiscal Restraints, and European Monetary Union." *American Economic Review* 86(2): 134-38.

Esteller-Moré, A. 2003."La eficiencia en la administración de los tributos cedidos: un análisis explicativo" Papeles de Economía Española, 95, 320-34

Fedelino, A. and T. Ter-Minassian. 2009. "Macro Policy Lessons for a Sound Design of Fiscal Decentralization". IMF Fiscal Affairs Department. July.

FIEL. 1993. *Hacia una nueva organización del federalismo fiscal en la Argentina*. Buenos Aires.

------ 2003. *El ambiente de negocios en las provincias argentinas*. Buenos Aires.

------ 2006. *Instituciones fiscales para la Argentina*. Buenos Aires.

------ 2010. *Argentina, política fiscal y cohesión social: el federalismo cuenta*. Fundación Carolina.

Filimon, R., T. Romer and H. Rosenthal. 1982. "Asymmetric Information and Agenda Control: The Bases of Monopoly Power in Public Spending. Journal of Public Economics, 17:51–70.

Fullerton, D. and S. West. 2002. "Can Taxes on Cars and on Gasoline Mimic and Unavailable Tax on Emissions?" *Journal of Environmental Economics and Management* 43, 135-157.

Gomez Sabaini J. and J. Jimenez. 2010. "El Financiamiento de los Gobiernos Subnacionales en America Latina". CEPAL. Agosto.

Gomez Sabaini J. and J. O'Farrell. 2009. "La Economía Política de la Política Tributaria en América Latina". 21 seminario de Política Fiscal. ILPES/CEPAL. Enero.

Gordon, R. and W. Li. 2009. "Tax Structures in Developing Countries; Many Puzzles and a Possible Explanation". *Journal of Public Economics*. 93. 855-866.

Govinda Rao M. 2006. "Transition to Market and Normative Framework of Fiscal Federalism" in E. Ahmad and G. Brossio (Eds) *Handbook of Fiscal Federalism*.

Greene, W. 2005. "Censored Data and Truncated Distributions," Working Papers 05-08, New York University, Leonard N. Stern School of Business, Department of Economics

Hines, J. and R.Thaler. 1995. "The Flypaper Effect," *Journal of Economic Perspectives*, American Economic Association, Vol. 9 (4). Fall. Pages 217-226.

IARAF. 2010 a. "Volvió a subir la presión tributaria provincial sobre la actividad económica". Córdoba, Octubre.

---------- 2010 b. "Los principales municipios del país continuaron aumentando la carga tributaria sobre la actividad económica durante 2010". Instituto Argentino de Análisis Fiscal. Córdoba 29 de Diciembre.

IERAL. 2004. "Carga Fiscal provincial y municipal. Análisis de las 23 jurisdicciones provinciales, CABA y 100 municipios de todo el país. Año 2004". IERAL de Fundación Mediterránea. Diciembre,

--------- 2006. "Proyecto Carga Tributaria Provincial y Municipal. Síntesis de los resultados de la medición anual 2006. IERAL de Fundación Mediterránea". 13 de Diciembre,

Inman, R. 2008. "The fly paper effect". NBER Working paper 14579. December.

Joumard I. and P. Kongsrud. 2003. "Fiscal Relations across Government Levels". OECD Economics Department Working Paper No. 375. December.

Keen, M. and A. Simone. 2004. "Tax Policy in Developing Countries: Some Lessons from the 1990s and Some Challenges Ahead" in S. Gupta, B. Clements and G. Inchauspe (eds) *Helping Countries Develop: The Role of Fiscal Policy*. International Monetary Fund. Washington DC.

Kenney, L. and S. Winner. 2006. "Tax Systems in the World: An Empirical Investigation into the Importance of Tax Bases, Collection Costs, and Political Regime". *International Tax and Public Finance.* vol 13.

López Murphy R. and C. Moskovits. 1998. "Desarrollos recientes en las finanzas de los gobiernos locales en Argentina". FIEL Documento de Trabajo No. 58, Noviembre.

Martinez-Vazquez J. Rider M. 2008. "The Assignment of The Property Tax: Should Developing Countries follow the conventional Wisdom?" International Studies Program. Working Paper 08-21. Georgia State University. December.

McLure, Ch. 2003. "Intergovernmental Fiscal Relations and Resource Development" Special Report of the International Tax & Investment Center. Washington DC, November.

McLure Ch. and J. Martinez-Vazquez. 2002. "The Assignment of Revenues and Expenditures in Intergovernmental Fiscal Relations".

Nicolini J. J. Posadas J. Sanguinetti P. Sanguinetti and M. Tommasi. 2002. "Decentralization, Fiscal Discipline in Governments and the Bailout Problem: The Case of Argentina". Inter-American Development Bank. Research Working Paper No. R-467. August.

Oates W. 1978. "The Changing Structure of Intergovernmental Fiscal Relations". In Oates W. (Ed.) 1991. *Studies on Fiscal Federalism*. Edward Elgar Publishing Company.

---------1999 "An Essay on Fiscal Federalism". *Journal of Economic Literature.* No. 37.

Oates, W. and R. Schwab. 2004. *What should local governments tax: income or property?* in, City Taxes. City Spending, Amy Ellen Schwartz, ed., Edward Elgar

Purfield, C. 2004. "The Decentralization Dilemma in India". IMF Working Paper 32.

Rattso, J. and P. Tovmo. 2002.Fiscal Discipline and Asymmetric Adjustment of Revenues and Expenditures: Local Government Responses in Denmark". *Public Finance Review.* 30, 3. 208-234.

Saiegh, S. and M. Tommasi. 1998. "Argentinas Federal Fiscal Institutions: A Case Study in the Transaction-Cost Theory of Politics." Buenos Aires, Argentina: CEDI and Universidad de San Andrés. Mimeographed document.

Saiegh S. and M. Tommasi. 1999. "Why is Argentina's Fiscal Federalism so Inefficient? Entering the Labyrinth" *Journal of Applied Economics.* Vol. II. No. 1. Pp 169-209. May.

Sanguinetti P., J. Sanguinetti and M. Tommasi. 2001. "La conducta fiscal de los gobiernos municipales en Argentina. Los determinantes económicos, institucionales y políticos". Febrero.

Sepulveda C. and J. Martinez-Vazquez. 2009. "Property Taxation in Latin-America: An Assessment and Options for Reform". Paper presented at the CEPAL-GTZ conference "Relaciones intergubernamentales y descentralización en América Latina". Santiago, Noviembre.

Shleifer. A. and R. Vishny. 1998. *The grabbing hand: government pathologies and their cures.* Harvard University Press.

Slemrod, J. and J. Bakija. 1996. *Taxing Ourselves. A Citizen's Guide to the Great Debate Over Tax Reform.* The MIT Press.

Spiller, P., and M. Tommasi. 2008. "Political Institutions, Policymaking Processes and Policy Outcomes in Argentina." In: E. Stein and M. Tommasi, editors. *Policymaking in Latin America: How Politics Shapes Policy.* Cambridge, United States: Harvard University Press.

Stein E., M. Tommasi, K. Echebarria, E. Lora and M. Payne. 2006. *The Politics of Policies. Economic and Social Progress in Latin America.* Inter-American Development Bank. Harvard University.

Sturzenegger F. and R. Werner. 2006. "Fiscal Federalism and Procyclical Spending: The Cases of Argentina and Brazil", *Economica.* La Plata LII, Nro. 1-2.

Ter-Minassian, T. and J.P. Jiménez. 2011. "Macroeconomic challenges of fiscal decentralization in Latin America". Serie Macroeconomía del desarrollo N° 112, CEPAL. Santiago de Chile

Tommasi M. 2002. "Federalism in Argentina and the Reforms of the 1990's". August.

Varsano, R., T. Pereira, E. Amorim Araujo, N. Costa da Silva and M, Ikeda. 2001. "Substituindo o PIS e a COFINS-E Por Que Nao a CPMF? – Por Uma Contribucao Nao Cumulativa. Instituto de Pesquisa Economica Aplicada (IPEA). Rio de Janeiro Outubro.

Vegh, C. and G. Vuletin. 2010. "Unsticking the Flypaper Effect Using Distortionary Taxation" (mimeo). May.

Wang, H. and C. Ho. 2010. Estimating Fixed-Effect Panel Stochastic Frontier. Models by Model Transformation. *Journal of Econometrics* 157, 286-296.

Weingast, B. 2006. "Second Generation Fiscal Federalism: Implications for Decentralized Democratic Governance and Economic Development". June.