



Revista de Economía y Estadística - Vol. XLVII - N° 2 - (2009) - pp 41- 66  
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## **Fiscal Transfers, Public Sector Wage Premium and the Effects on Private Wages\***

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### **ABSTRACT**

*We examine the relationship between federal transfers, the existence of a wage premium for the public sector and its effects on private wages in Argentina. The empirical analysis is based on the theoretical presumption that federal fiscal transfers to the different regions are being used to finance more public employment therefore discouraging private activity. The results suggest that the public sector pays a wage premium relative to the private sector. This premium is increasing in the level of per capita federal*

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\* We thank an anonymous referee for useful comments and suggestions. The authors acknowledge financial support from the Ministerio de Ciencia de la Provincia de Córdoba through a PID grant 46/2008 and from the Agencia Nacional de Promoción Científica y Tecnológica through a FONCyT grant PICT 2007-805. Sebastian Freille gratefully acknowledges financial support from CONICET through a Postdoctoral Grant.

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*transfers. There is no evidence of an overall positive effect on wages in the private manufacturing sector. However, we find a significant positive relationship between federal transfers and wages paid to workers with less formal education; for jobs requiring a technical or professional qualification the relationship is negative. These results broadly support the hypothesis that the private sector faces harder competition in the labour market in provinces which receive larger transfers from the central government.*

Keywords: Inter-governmental Transfers; Labour Markets; Wage premium; Fiscal Policy

JEL Codes: H77, J31, J45, R11.

## RESUMEN

*Se examina la relación entre transferencias federales, la existencia de un premio salarial en el sector público y sus efectos sobre los salarios privados en Argentina. El análisis empírico se basa en la presunción teórica que las transferencias fiscales desde el gobierno federal se utilizan para financiar mayor empleo público desincentivando la actividad privada. Los resultados sugieren que el sector público paga un premio salarial. Este premio es creciente en el nivel de transferencias por habitante. No hay evidencia de un efecto agregado positivo sobre los salarios privados. Sin embargo se encuentra una relación positiva y significativa entre transferencias y los salarios pagados a trabajadores con menor educación, para trabajos que requieren una calificación técnica ó profesional la relación es negativa. Los resultados apoyan, en general, la hipótesis que el sector privado enfrenta una mayor competencia en los mercados de trabajo en aquellas provincias que reciben mayores transferencias desde el gobierno central.*

Palabras clave: Transferencias Intergubernamentales; Mercados de Trabajo; Premio Salarial; Política Fiscal.

Códigos JEL: H77, J31, J45, R11.

## I. INTRODUCTION

Despite the long-standing presence of a system of fiscal transfers aimed at ensuring redistribution among provinces with strong egalitarian aims, there are no signs that the pre-existing differences in levels of development for the different regions are receding. In a previous paper, we argued that it was precisely the existence of a system of statutory federal transfers

with the specifics of the Argentine case that was behind this situation. In an earlier empirical investigation, Capello and Figueras (2007) and Capello et al. (2008) found evidence suggesting a non-benevolent behaviour in the application of federal transfers by provincial governments. More specifically, they show that transfers are primarily used for hiring staff contrary to what is predicted by the literature on benevolent governments, namely a reduction of the legal tax burden in the administrations receiving the federal funds. In any case, there would seem to exist a reduction on the de facto effective tax burden possibly due to the existence of lowered incentives to collect local taxes efficiently.

One likely explanation for the persistent development gap between rich and poor Argentine provinces is that the latter, despite receiving the largest amount of transfers, have failed to channel these resources into profitable activities in the private sector. In this sense, Capello and Figueras (2007) and Capello et al. (2008) found that from 1991 to 1998 the Argentine provinces that received the largest transfers per capita were among the worst performers when considering the production of industrial manufactures. The authors explain that this situation may be due to a Dutch-disease type of phenomenon. More specifically, they contend that this phenomenon is rooted in the system of federal transfers and is further aggravated by the way these funds are applied by sub-national governments. In this way, there is a quite evident paradox: while the system of inter-governmental transfers provides greater spending capacity to the subsidized provinces, it indirectly discourages industrial production due to distortions arising from the regional labour markets. The persistence of this situation has significant negative effects on regional growth and has additional implications for the catch-up process. In this paper, we focus on this channel, particularly studying the effects of the transfer system on the conditions of the labour market.

## **II. FISCAL POLICY, REGIONAL ECONOMIES AND PRIVATE WAGES.**

Several previous papers (Figueras 1992; Figueras 2008; Figueras et al. 2009) have stressed that regional economies face a significant external constraint which represents a major obstacle for reducing unemployment. Although it is difficult to estimate this effect empirically since it is not possible to measure the geographic GDP using the expenditure method, the

intuition behind it will become evident. This regional external constraint has its origin in structural factors, the most important being the lack of regional competitiveness (the argument is similar for the national external constraint). The lack of competitiveness is due to several factors:

- low rate of investment in physical capital and poor quality of human capital
- low degree of economic openness
- the existence of an oversized public sector
- resource flight (capital, labour)

Various measures have been implemented from both the national and sub-national governments to help alleviating the regional constraint. Most of these were fiscal measures and often entailed increases in the number of civil servants and of course, the expenses of their payroll in the regions. The result was a steady increase in sub-national deficits which eventually meant that the national government was forced to bail out on those provinces dealing with fiscal troubles.<sup>1</sup> This situation echoes the predictions of the literature on the effects of fiscal policy on investment and production. In an influential paper, Alesina et al. (2002) develop a model where fiscal policy, in the form of higher public employment or higher wages, creates wage pressure for the private sector. More specifically, the authors specify a labour market channel through which increases in public wages or employment put upward pressure on private wages thereby discouraging private investment and production. The theoretical basis of our analysis results from embedding this idea into a regional economics framework.

In terms of a two-region setup with competitive product markets, for profits to be equal regardless of location, it is necessary that firms compensate higher transport costs with lower production costs -usually via lower wages or tax deductions. In this way, firms will find it profitable to invest in less developed regions which, in this case, will attract more labour -perhaps in response to wage differentials. However, if this

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1. In this paper, we do not elaborate on a related issue, namely the political economy problem that arises from the financial dependence on the national government and the likely political constraints borne by the sub-national administrations.

compensation is absent or insufficient, then activity will likely concentrate away from the less developed region and around the main industrial hub.

A similar two-region setup was suggested in Figueras (1991) and Díaz Cafferata et al. (1999) who distinguished two different territorial regions in the context of the Argentine republic: the richer industrial coastal strip, which they labelled “*Franja Industrial del Litoral*” (or FIL) covering from La Plata to Rosario and the poorer interior regions known as “*Economías Regionales del Interior*” (or ERI). This distinction is important since both regions have experienced different fortunes especially in the last twenty years.<sup>2</sup> In particular, one aspect where these two regions were in sharp contrast is the unemployment rates. The ERI’s saw an important increase in their average unemployment rates during the 90’s which, we argue, was due (at least partly) to the insufficient compensation in the form of wage differentials. This eventually led to active fiscal policies intended to alleviate the mounting social pressure; as noted above, largely these policies amounted to increasing public employment in the ERI’s (see Porto (1989)), further lowering relative prices and damaging regional competitiveness.<sup>3</sup>

The persistence of these policies not only affected sub-national budgets but also produced several distortions in regional labour markets. With competitive markets and mobile labour, we expect regions to converge in income (Hirschman (1958)). The main reason is that the existence of wage differentials between the regions is likely to stimulate labour mobility from markets with infinitely inelastic labour supply (Baumol markets) to markets with infinitely elastic labour supply (Lewis markets).<sup>4</sup> However, if there are institutional constraints, the predicted mobility may not result. One such type of institutional constraint is the existence of unions and regulations that may affect the characteristics of the labour markets (i.e. for instance, having Lewis-type markets behaving as Baumol-type markets; see Llach (1988) for details).

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2. Besides this, in the economic history, their performances were very different too, nevertheless this interesting point will not be discussed in this paper.

3. The economic crisis that many Argentine provinces suffered through the 90’s was partly the result of the decision of the national government to put on indefinite hold the fondos compensatorios (inter-jurisdictional transfers) that were regularly used for bailing out sub-national governments. This produced a severe contraction in aggregate demand in many provinces that added to the crisis in some regional products resulting in a sharp rise in unemployment levels.

4. In Lewis markets, changes in the demand for labour does not affect (nominal) wages thereby allowing for the existence of quasi-rents of abundant labour and long-run growth, while in Baumol-type markets changes in the demand for labour increase (nominal) wages. See Lewis (1954) and Baumol (1967).

With regards to the Argentine case, this implies that we should expect labour mobility from low-wage regions, as Jujuy or Catamarca, to high-wage regions, as Buenos Aires (see Table 1 for additional examples). However, even if the evidence confirms that the wages in the ERI are indeed lower than wages in the FIL ( $W_{\text{ERI}} < W_{\text{FIL}}$ ) as expected, it has been suggested that the wage premium is not large enough to compensate for the additional costs faced by provinces in the ERI region in addition to the significant increase in the number of public employment.<sup>5</sup> Similarly, we observe that income per capita in the ERI region is lower than income per capita in the FIL region ( $Y_{\text{ERI}} < Y_{\text{FIL}}$ ). As additional evidence, it has also been documented that the growth in public employment in terms of the economically active population (EAP) is higher in the ERI's (see Porto, 1989).

Our work goes along the same theoretical lines as those presented in Alesina et al. (2002) but the focus here is on the effects of the allocation of federal transfers on the regional markets and its implications for manufacturing production. Several studies have examined this problem in recent years. Marqués Sevillano and Rosselló Villalonga (2004) focus on the effect of political variables on the regional levels of public employment. They find that the central government increased the number of public jobs in less favoured regions and particularly so in regions politically aligned with the central government. In addition to this, Kessler and Lessmann (2009) examine the relationship between interregional transfers and regional disparities. They build a theoretical model where migration decisions are distorted by the existence of positive federal transfers (i.e. migration would take place in the right direction without federal transfers).

We argue that the main reason resource mobility failed to operate in the predicted way was because the wage premium between both regions was not sufficiently large. This was due to the following reasons:

- The existence of an integrated labour market where the benchmark consisted of the national-level public wage –this wage is not related to the marginal productivity of labour (Figueras, 1992).
- The emergence of labour demand with negative marginal productivity, where the reserve price of labour is above the price that would be consistent with the state of industrial development in the region.

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5. The existence of nationwide Baumol-type labour market is only sustainable for the region receiving all the surplus (identified by Samir Amin as “the Center”) via relative prices (or internal terms of trade) but not for the region giving up the surplus (named by Amin as “the periphery”).

That fact that wages in both regions were not related with marginal productivity but rather with institutional factors, prevented the existence of a significant wage premium that would have encouraged labour mobility and investment in the ERI's and therefore further delayed industrialization in these regions. Some authors have explored the occurrence of this phenomenon and its implications from a regional economics perspective. For instance, Figueras (1991) develops a simple microeconomic framework to study the spatial effects of industry concentration arising from regions with identical wages and productivity differentials. There is also empirical evidence supporting this hypothesis for the United States (Kaufman and Foran (1971)).

Our central idea is also supported by the view that inter-jurisdictional transfers can cause a fall in the "regional" real exchange rate, as it is well documented in the literature. Usually known as the transfer paradox, this has the effect of removing (or at least alleviating) a region's budget restriction<sup>6</sup> and ultimately affecting its regional competitiveness through discouraging productive activities. One important exception to this situation is the case presented by Balassa (1964), when there is an increase in the productivity of tradable goods without any loss of competitiveness despite the increased transfers.

### III. THE REGIONAL LABOUR MARKET

Despite there being a chronic excess of labour supply in the ERI's, this does not seem to have resulted in a lower wage and a higher amount of resources attracted to the poorer regions. If this process had operated as theoretically expected, it would have stimulated higher investment and growth helping to close the income gap between the FIL and the ERI regions. We argue that this process did not take place due to several institutional features of the Argentine labour markets like:

- Migration alleviating regional markets. Migration took place from the periphery (known also as ERI) to the centre (FIL) thus alleviating the pressures on regional labour markets preventing the operation of Lewis markets at the regional level. In the FIL, in turn, owing to the presence of

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6. This phenomenon has been studied mainly within the context of international capital movements, although more recently several authors have pointed to a similar effect within the national boundaries.

an integrated labour market (Baumol market), there remained supply deficiencies and this helped foster unionisation.

- The existence of a growing demand for labour by regional public administrations. Increased federal transfers to the sub-national administrations stimulated higher demand for labour, mainly from the public sector. The result was relatively high wages (higher than productivity wages) and high reserve wages (higher than those that would exist without the transfers) in the provinces.<sup>7</sup>

- The gradual integration of regional labour markets into a single nationwide labour market. This had the effect of raising wages in the periphery to levels similar to that of the centre despite the latter having a higher productivity per capita. This is the reason why wages historically deviate from the marginal productivity condition and are instead determined attending to sociological reasons. Pressure from labour unions is such that labour markets end up behaving as a single nationwide market (this is specially so when public employment increases and wages are set with reference to the public wages at the national level). In this case, sectoral and spatial segmentation, typical of Lewis markets, are absent. In fact, the country as a whole behaves as a nation-wide Baumol labour market.<sup>8</sup>

Further evidence of this phenomenon is provided by Capello and Ponce (1997) where the authors suggest that those provinces receiving the largest transfers per capita have a higher share of public officials as a fraction of their population. Furthermore, the authors provide evidence suggesting that the larger the federal transfers the larger the per capita spending on public payroll. This work provides relevant insights and serves as an additional motivation for exploring the labour market channel in the relationship between transfers and industrial production. Thinking along similar lines, in this work we explore the hypothesis that there exists a public wage premium relative to the private sector; in other words, whether people employed in the public sector earn on average higher

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7. Remember that in Baumol markets with infinitely inelastic supply of labour, wages rise in response to an increase in demand for labour.

8. This structural characteristic of labour markets prevents convergence from taking place since it does not stimulate higher capital accumulation in the ERI. Following Kaldor, this is a situation known as (relative) wage efficiency which we could naturally generalize to the case of other factors also defined similarly to  $WERI < WFIL$ . Given that productivity is known to be lower in the ERI, this situation inevitable leads to higher economic growth in the FIL (Figueras and Ponce (1998), Figueras (2008), Richardson (1977)).



wages than those employed in the private sector. Additionally, we also explore the hypothesis that this public wage premium is influenced by the amount of fiscal transfers received by the different regions. More specifically, we explore whether fiscal policy by the central government, defined as federal transfers to regional jurisdictions, has an effect on the public wage premium. In other words, we examine whether the mechanism suggested by Alesina et al. (2002), whereby fiscal policy often results in increases in both the number and pay rate of public employees, is also relevant for the case of interjurisdictional fiscal transfers. We also comment on the implications that this may have regarding the expected and actual effects of the system of federal transfers currently in place in Argentina. This is important since despite the sustained transfers to the poorest provinces, these have not been able to increase investment and balance their budgets but have rather inflated their public sector by hiring additional workers, increasing public wages or a combination of both.

#### IV. EMPIRICAL METHODOLOGY

Our previous research in this area covers a number of related aspects to the present investigation from both a theoretical perspective (Figueras, 1992; Figueras, 2008; Figueras and Ponce, 1998; Figueras et al., 2009) and an empirical investigation (Capello and Ponce, 1997). Specifically, some of the aspects related with the mechanism of the labour market are studied in Figueras and Ponce (1998) and the positive relationship between federal transfers and per capita public spending is examined in Capello and Ponce (1997).

In this paper we bring together two areas: the relation between transfers and public spending and the problem of regional labour markets. The purpose in this paper is to examine the hypothesis that the existence of a system of federal transfers is related with the labour market phenomenon we have described earlier. More specifically, we will address two central aspects: (a) given the existence of a wage premium in the public sector relative to the private sector<sup>9</sup>, we will examine whether this premium is positively related with the level of federal transfers received by the provinces and (b) whether higher federal transfers have a positive effect on wages in the private sector. Our goal is to find out whether there is empirical support

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9. We use a broad definition of the public sector including not only workers in the public administration but also those who claim to work in the public sector as registered in the EPH.

for our main theoretical presumption of the detrimental effects of federal transfers on the private sector through an increase in both the number and the average pay of public employees.

To deal with these issues, we proceed by using the well-known Mincer wage-equation. We first explore whether wages in the private sector are on average lower than in the public sector and, if this is true, whether it is due to personal characteristics or also to the fact that being employed in the public sector is associated with a higher wage. Next, we present our main hypothesis regarding the relationship between fiscal transfers and public wages using an augmented Mincer equation to control for the level of public transfers. Finally, we explore the issue whether transfers have an effect on wages in the private sector. We are also interested to see whether the effects of fiscal transfers on wages vary depending on the level of educational attainment or qualification of workers.

#### **IV.1. Does the Public Sector pay a wage Premium?**

Table 1 shows public and private average wages between 1996 and 2002 for 29 urban areas where the Statistics and Census National Institute (INDEC) carries out a Household Survey (Encuesta Permanente de Hogares, EPH). Until the first semester of 2002, the EPH was surveyed twice a year, May and October, since then, the EPHs methodology was subject to major changes that make difficult to extend our period of analysis. Additionally, this period is characterised by a relatively stable economic structure allowing us to focus on the evolution of the differences between public and private wages and the effect of transfers on this wage premium.<sup>10</sup> The first clear outcome that emerges from Table 1 is that the average hourly wage in the public sector is considerably higher than in the private sector as a whole, from 32% in the Conurbano (the surrounding areas around the city of Buenos Aires), to 111% in the case of Santiago del Estero, capital of the province of the same name, and one of the poorest provinces in Argentina. If the private sector is dividend among different sub-sectors, primary, manufactures and other sectors, the results do not vary much, only in three cases (Neuquen, Buenos Aires, and Río Gallegos) the average wage in the public sector is lower than in the primary sectors,

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10. The structural conditions were subject to significant changes after the 2001 crisis and the effects of the devaluation in 2002.

for all other cities and sectors, the average wage rate paid by the public sector is higher. When comparing with the manufacturing sector, the one we may assume is more likely to relocate between regions in responses to differences in costs, the excess in the average wage paid by the public sector goes from 23% in Bahia Blanca to a 121% in Posadas, city which is also among the poorest in the country.

**Table 1**  
**Average hourly wage in the public and private sectors, 1996-2002**

URBAN AREA	PRIVATE SECTOR				
	PUBLIC SECTOR	ALL SECTORS	PRIMARY SECTORS	MANUFACT.	OTHER SECTORS
BAHÍA BLANCA	4.69	3.35	2.45	3.82	3.26
CIUDAD DE BUENOS AIRES	7.49	5.39	9.05	5.83	5.29
COMODORO RIVADAVIA	5.54	3.90	5.90	3.35	3.55
CONCORDIA	3.72	2.15	1.64	2.20	2.22
CONURBANO	4.59	3.49	2.88	3.51	3.48
CORRIENTES	3.39	2.05	2.88	2.52	1.99
FORMOSA	3.58	1.82	1.88	1.82	1.81
GRAN CATAMARCA	4.16	2.20	2.43	2.20	2.20
GRAN CÓRDOBA	5.04	2.90	2.86	3.03	2.8
GRAN LA PLATA	4.75	3.54	2.78	3.76	3.52
GRAN MENDOZA	4.71	2.75	3.38	2.86	2.70
GRAN RESISTENCIA	4.30	2.19	1.64	2.03	2.21
GRAN ROSARIO	4.31	3.17	4.27	3.17	3.16
GRAN SAN JUAN	4.53	2.41	2.33	2.43	2.41
LA RIOJA	4.32	2.46	2.24	2.60	2.42
MAR DEL PLATA Y BATÁN	4.99	3.29	3.49	3.19	3.31
NEUQUÉN Y PLOTTIER	5.09	3.40	5.49	3.38	3.22
PARANÁ	4.19	2.63	1.94	2.55	2.65
POSADAS	4.50	2.21	2.94	2.04	2.22
RÍO CUARTO	5.05	2.70	2.54	2.37	2.76
RÍO GALLEGOS	6.07	3.73	6.83	3.02	3.45
S.M. DE TUCUMÁN Y TAFÍ VIEJO	4.41	2.43	2.69	2.53	2.41
SALTA	4.07	2.25	2.14	2.19	2.26
SAN LUÍS Y EL CHORRILLO	4.12	2.61	2.37	2.95	2.44
SAN S. JUJUY Y PALPALA	3.82	2.07	1.79	2.00	2.09
SANTA FE Y SANTO TOMÉ	4.58	2.86	1.26	2.87	2.86
SANTA ROSA Y TOAY	4.40	2.64	1.89	2.49	2.68
SGO. DEL ESTERO Y LA BANDA	4.41	2.09	2.34	2.15	2.08
TIERRA DEL FUEGO	7.92	4.73	5.91	5.75	4.35

Source: own calculations based on Encuesta Permanente de Hogares (EPH).

It should be noted that the fact that we find the average wage rate in the public sector is higher than the wage rate paid by the private sector does not necessarily mean the public sector is paying a wage premium, these differences could be originated because public employees have different characteristics to those of people working in the private sector. Table 2 reports the mean values for different characteristics of workers employed in the public and private sector. The main differences that may contribute to explain the higher wages paid in the public sector are age, and job tenure, which both are higher in the case of people working in the public sector. Also, other characteristics with the same effect are the proportion of people with higher formal education as well as being employed for jobs that require a higher qualification, which also are higher in the case of the public sector.

**Table 2**  
**Public and Private Employment Characteristics, Means 1996-2002**

	PUBLIC SECTOR	PRIVATE SECTOR
AGE (YEARS)	40.2	35.4
TENURE (YEARS)	10.5	5.3
MALE (%)	47.0	61.2
INCOMPLETE HIGH SCHOOL (%)	32.0	56.0
INCOMPLETE TERTIARY/UNIVERSITY (%)	34.0	34.0
COMPLETE TERTIARY/UNIVERSITY (%)	33.0	10.0
THE JOB REQUIRES NO QUALIFICATION (%)	13.0	33.0
THE JOB REQUIRES AN OPERATIVE QUALIFICATION (%)	36.0	48.0
THE JOB REQUIRES A TECHNICAL QUALIFICATION (%)	35.0	14.0
THE JOB REQUIRES A PROFESSIONAL QUALIFICATION (%)	16.0	5.0

Source: own calculations based on EPH

To go deeper into the question if higher wages in the public sector are solely explained by differences in the characteristics of people employed in the public sector vis à vis those who are employed in the private sector, or if there is indeed a positive wage premium paid by the public sector, we estimate a Mincer-type wage equation where the wage rate paid to a person is a function of her personal characteristics, as well as other variables, one of which is a dummy variable controlling for the worker being employed or not in the public sector. Through the interaction of this dummy variable with other variables, such as formal education and the qualifications required

by the job a person is employed for, we allow the wage premium to vary across people with different characteristics. We estimate this wage equation for each year in the period 1996-2002. More specifically, the equation we estimate is the following:

$$\ln(w_i) = \alpha_1 AGE_i + \alpha_2 (AGE_i)^2 + \gamma MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i} + \sum_{h=2}^3 \psi_h EDUC_{h,i} + \lambda PUB_i + B'X + u_i \quad (1)$$

where:  $w_i$  is the hourly wage rate of worker  $i$ ;  $AGE$  is the age of worker  $i$ , in years;  $MALE$  is a dummy variable equal to 1 if worker  $i$  is male;  $TENURE$  is a dummy variable to control for the worker tenure, the tenure periods, in years, are: (1,2], (2,5], (5,10], (10, ...). The reference group is less or equal than 1 year;  $EDUC$  denote dummy variables to control for the level of formal education of worker  $i$ ; the education groups are: complete high school or incomplete tertiary/university ( $h=2$ ), and complete tertiary/university ( $h=3$ ). The reference group ( $h=1$ ) is incomplete high school or less;  $PUB$  is a dummy variable equal to 1 if worker  $i$  is employed in the public sector; and  $X$  is a set of dummy variables to control for place of residence, sector of activity, and if the EPH was surveyed in October. We also run equation 1 allowing for the interactions of the  $PUB$  dummy with the three education dummies. Additionally, we estimate a second version of the wage equation, but instead of using formal education to distinguish between workers with different skills, we use four dummy variables which control for the skills required by the job person  $i$  is employed for. In this case the wage equation is as follow:

$$\ln(w_i) = \alpha_1 AGE_i + \alpha_2 (AGE_i)^2 + \gamma MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i} + \sum_{h=2}^4 \psi_h QUAL_{h,i} + \lambda PUB_i + B'X + u_i \quad (2)$$

where  $QUAL$  is a set of dummy variables to control for the skill requirements of the job worker  $i$  is employed for. The dummies are: the job requires an operative qualification ( $h=2$ ); a technical qualification ( $h=3$ ); or a professional qualification ( $h=4$ ). The reference group is the job requires no qualification ( $h=1$ ). As with equation 1, we run equation 2 allowing for the interactions

of the *PUB* dummy with the skill requirement dummies. The results of equation 1 and 2 are summarized in Table 3. The upper block of Table 3 reports the estimated wage premium when using equation 1. As the results shows, after controlling for all other variables, there still exists a positive and statistically significant wage premium of 7%-10% in favour of public employees. However, this wage premium is much lower than the one obtained when we just simply compare average wages of public and private employees. When we allow for the wage premium to vary across workers, depending on the level of formal education, the results shows that the public sector wage premium is higher for workers with an intermediate level of education. However, for the other two groups (incomplete high school or less, and complete tertiary/university), the wage premium is still positive and significant. In the lower block of Table 3, we present the results when the wage equation is estimated using equation 2. Here again, we obtain that overall, there is a positive wage premium favouring public employees. If allowing for the wage premium to vary according to the skill requirements of the job, we find out that this premium is higher for jobs requiring a low qualification (no qualification and an operative qualification). For jobs requiring a technical qualification the wage premium is also positive, whilst the opposite outcome is obtained in the case of the most skilled jobs, those which require a professional qualification, in this case the public sector pays a statistically significant lower wage.

**Table 3**  
**Estimated Wage Premium**

CONTROLLING BY EDUCATION	1996	1997	1998	1999	2000	2001	2002
WAGE PREMIUM (OVERALL)	6,6(a)	10,2(a)	9,8(a)	9,1(a)	8,8(a)	9,8(a)	10,0(a)
WAGE PREMIUM (INCOMPLETE HIGH SCHOOL)	6,9(a)	8,0(a)	8,8(a)	7,3(a)	8,6(a)	9,2(a)	11,5(a)
WAGE PREMIUM (INCOMPLETE TERTIARY/UNIVERSITY)	12,8(a)	15,9(a)	16,0(a)	11,8(a)	12,6(a)	14,1(a)	13,0(a)
WAGE PREMIUM (COMPLETE TERTIARY/UNIVERSITY)	-1,6	6,7(a)	4,6(a)	8,4(a)	5,0(a)	6,1(a)	4,8(a)
CONTROLLING BY JOB SKILL REQUIREMENTS	1996	1997	1998	1999	2000	2001	2002
WAGE PREMIUM (OVERALL)	5,7(a)	7,3(a)	7,6(a)	7,9(a)	6,2(a)	7,8(a)	6,3(a)
WAGE PREMIUM (NO QUALIFICATION)	3,9(b)	6,3(a)	10,6(a)	8,9(a)	7,5(a)	11,7(a)	13,1(a)
WAGE PREMIUM (OPERATIVE QUALIFICATION)	7,2(a)	8,9(a)	13,3(a)	13,8(a)	10,2(a)	12,7(a)	10,8(a)
WAGE PREMIUM (TECHNICAL QUALIFICATION)	13,0(a)	11,5(a)	5,2(a)	4,8(a)	6,5(a)	6,2(a)	2,1(a)
WAGE PREMIUM (PROFESSIONAL QUALIFICATION)	-16,7(a)	-8,9(a)	-5,0(b)	-0,3(a)	-9,2(a)	-8,0(a)	-9,9(a)

(a) Significant at 1% level; (b) Significant at 5% level. Source: own calculations based on EPH

## IV.2. Public Sector Wage Premium and Vertical Fiscal Transfers

Once we have found evidence of a positive and significant wage premium in favour of public employees, we now analyse how the magnitude of the wage premium is affected by the level of transfers provincial governments receive from the federal government. The relevant concept here is that of net fiscal flows which deduct from the transfers per capita to region  $i$  the amount of tax resources that are originated in the same region and contributed to the tax pool. However, data on net transfers is much more difficult to obtain due to the methodological problems involved in its calculation. We were only able to get data on gross transfers per capita to the regions for the full period. However, we argue that there is a strong positive correlation between gross transfers per capita and net fiscal flows. We find this correlation to be high and significant for the period 2001-07 and for 2001-02 which coincides with the last two years in our sample. These correlations are given in Tables 4a to 4c. Although we cannot be sure that the same correlations are observed for the 1996-2002 period, given that there have not been significant changes to the way taxes are collected and transfers allocated in the last 25 years, we believe that our results should not be qualitatively different if we used data on net fiscal flows.

**Table 4a**  
**Correlation Coefficients between Gross Per Capita Transfers and Net Fiscal Flows**

	NET FISCAL FLOWS CO-PARTICIPATION 2001-2007	NET FISCAL FLOWS TOTAL 2001-2007
CO-PARTICIPATION TRANSFERS 2001-2007	0.85 <sup>(a)</sup>	0.56 <sup>(a)</sup>
NO. OBS	153	153

(a) Significant at the 1% level; (b) significant at the 5% level. Source: Data on Co-participation Transfers from MECON. Data on net fiscal flows from Ruarte Bazan (2008).

**Table 4b**  
**Correlation Coefficients between Gross Per Capita Transfers and Net Fiscal Flows**

	NET FISCAL FLOWS COPARTICIPATION 2001-02	NET FISCAL FLOWS TOTAL 2001-2002
<b>CO-PARTICIPATION TRANSFERS 2001-2002</b>	0.53 <sup>(a)</sup>	0.29 <sup>(b)</sup>
<b>No. OBS</b>	42	42

((a) Significant at the 1% level; (b) significant at the 5% level. Source: Data on Co-participation Transfers from MECON. Data on net fiscal flows from Ruarte Bazan (2008).

**Table 4c**  
**Correlation Coefficients between Gross Per Capita Transfers and Net Fiscal Flows (alternative data)**

	NET FISCAL FLOWS TOTAL 2006
<b>CO-PARTICIPATION TRANSFERS 2006</b>	0.77 <sup>(a)</sup>
<b>No. OBS</b>	22

(a) Significant at the 1% level. Source: Data on Co-participation Transfers from MECON. Data on net fiscal flows from Ruarte Bazan (2008).

Table 5 reports the level of per capita transfers from the national government to provincial (local) governments. The first picture that emerges clearly from the figures reported is that there exists a large dispersion across provinces, with small and/or poor provinces receiving much higher transfers. In Table 6 we report the Pearson correlation coefficients between the public sector wages relative to wages in the private sector, and per capita income transfers. With the exception of primary activities and current transfers, the correlation coefficients are positive and statistically significant.



**Table 5**  
**Per Capita Income Transfers from the National Government:**  
**Current 1996-2002 average\***

URBAN AREA	TOTAL TAX TRANSFERS	CO-PARTICIPATION	CURRENT TRANSFERS
BAHÍA BLANCA	0.27	0.15	0.01
CIUDAD DE BUENOS AIRES	0.06	0.05	0.02
COMODORO RIVADAVIA	0.69	0.36	0.07
CONCORDIA	0.66	0.43	0.03
CONURBANO	0.27	0.16	0.01
CORRIENTES	0.62	0.40	0.04
FORMOSA	1.09	0.74	0.06
GRAN CATAMARCA	1.28	0.86	0.04
GRAN CÓRDOBA	0.43	0.29	0.02
GRAN LA PLATA	0.27	0.16	0.01
GRAN MENDOZA	0.40	0.26	0.02
GRAN RESISTENCIA	0.74	0.52	0.04
GRAN ROSARIO	0.44	0.29	0.02
GRAN SAN JUAN	0.86	0.57	0.06
LA RIOJA	1.17	0.75	0.86
MAR DEL PLATA Y BATÁN	0.27	0.15	0.01
NEUQUÉN Y PLOTTIER	0.60	0.33	0.09
PARANÁ	0.65	0.43	0.03
POSADAS	0.55	0.34	0.08
RÍO CUARTO	0.42	0.29	0.02
RÍO GALLEGOS	1.49	0.79	0.30
S.M. DE TUCUMÁN Y TAFÍ VIEJO	0.54	0.36	0.04
SALTA	0.56	0.36	0.05
SAN LUÍS Y EL CHORRILLO	1.02	0.65	0.03
SAN S. JUJUY Y PALPALA	0.73	0.46	0.10
SANTA FE Y SANTO TOMÉ	0.44	0.29	0.02
SANTA ROSA Y TOAY	1.01	0.62	0.10
SGO. DEL ESTERO Y LA BANDA	0.83	0.55	0.05
TIERRA DEL FUEGO	1.73	0.79	0.54

\* Figures are total values for the Province the urban areas is located in. Source: MECON

To further analyse this relationship we estimate our Mincer wage equation for the period 1996 to 2002, where the dummy controlling for worker  $i$  being employed in the public sector is interacted with the variable Transfers which measures per capita transfers from the National government to province  $p$  the urban area  $c$  is located in. We use two definitions for the variable Transfers, Total Tax Transfers, and Tax Transfers under the co-participation regime:

**Table 6**  
**Correlation Coefficients between Public Sector Relative Wages and Other Variables**

		FEDERAL TRANSFERS INCOME (PER INHABITANT)			
		PRIVATE SECTORS	TOTAL TAX TRANSFERS	CO-PARTICIPATION REGIME	CURRENT TRANSFERS
<b>PUBLIC SECTOR RELATIVE WAGE WITH RESPECT TO:</b>	All Sectors		0.388(b)	0.520(a)	0.096
	Primary Activ.		-0.018	-0.096	-0.087
	Manufactures		0.312(c)	0.424(b)	0.013
	Other Sector		0.523(a)	0.619(a)	0.200

(a) Significant at the 1% level; (b) significant at the 5% level; (c) significant at the 10% level.

Source: own calculations based on EPH and MECON

$$\ln(w_{i,t}) = a_1 AGE_{i,t} + a_2 (AGE_{i,t})^2 + \gamma_1 MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i,t} \quad (3)$$

$$+ \sum_{h=2}^3 \psi_h EDUC_{h,i,t} + \lambda_1 PUB_{i,t} + \lambda_2 [PUB_{i,t} \times \ln(TR_{p,t})] + B'X + u_{i,t}$$

where  $TR_{p,t}$  is the level of per capita transfer received by the province  $p$  person  $i$  lives in. As with equation 1, equation 3 is also estimated allowing for the interactions of  $PUB_{i,t} \times \ln(TR_{p,t})$  with the education dummies.

Similarly to what we did before, we estimate an alternative version of equation 3, but instead of using formal education to distinguish between workers with different skills, we use the four dummy variables to control for the skills required by the job person  $i$  is employed for:

$$\ln(w_{i,t}) = a_1 AGE_{i,t} + a_2 (AGE_{i,t})^2 + \gamma_1 MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i,t} \quad (4)$$

$$+ \sum_{h=2}^4 \psi_h QUAL_{h,i,t} + \lambda_1 PUB_{i,t} + \lambda_2 [PUB_{i,t} \times \ln(TR_{p,t})] + B'X + u_{i,t}$$

As with equation 2, equation 4 is also estimated allowing for the interactions of  $PUB_{i,t} \times \ln(TR_{p,t})$  with the qualification dummies.

Both, in equations (3) and (4), for any two persons with the same characteristics but the sector they work in, the change in the wage premium ( $WP$ ) for the public workers between two any periods  $t$  and  $t+j$  is given by:

$$WP_{t+j} - WP_t = (\lambda_{1,t+j} - \lambda_{1,t}) + \lambda_2 [\ln(TR_{t+j}) - \ln(TR_t)]$$

The first term on the RHS measures the change in the wage premium due to other reasons than changes in transfers, while the second term measures the change in the wage premium because of changes in transfers. The expression for the change in WP needs to be adapted accordingly when allowing for the interactions of  $PUB_{it} \times \ln(TR_{pt})$  with the education and qualification dummies.

Table 7 reports the outcomes for different specifications of equations 3 and 4. The first result that emerges is that the wage premium paid by the public sector has increased regardless of the evolution of public transfers: the coefficients  $\lambda_{1,t}$  increase as time moves forward. Additionally, this wage premium increases with the level of transfers received from the Federal government (coefficient  $\lambda_2$  is positive and statistically significant): a 1% increase in per capita transfers increases the public sector wage premium between 0.07% and 0.10%. When allowing for the effect of transfers to vary across workers with different education levels, we have that an increase in the transfers from the national to local governments has a positive and significant effect on the wage premium of workers independently of their formal education, with this effect being more important for workers with extreme skills. While for people with incomplete tertiary/university studies a 1% increase in per capita transfers raises the wage premium paid by the public sector by 0.04%-0.06%, for workers with incomplete high school or less or with complete tertiary/university the effect is twice as large, between 0.096%-0.11%. A similar result emerges when workers are distinguished in terms of the skill requirements of the job they do, now, a 1% increase in per capita transfers increases more the public sector wage premium of jobs requiring the least and most skilled workers (0.10% and 0.16% respectively) than for jobs which require an operative or technical qualification (0.067% and 0.08% respectively).

**Table 7**  
**OLS Regressions: Public wage premium and federal transfers**

VARIABLE	(1)	(1)	(2)	(2)	(1)	(1)	(2)	(2)
<b>PUB (1996)</b>	0.0838 <sup>a</sup> (0.007)	0.0841 <sup>a</sup> (0.007)	0.1340 <sup>a</sup> (0.008)	0.1347 <sup>a</sup> (0.008)	0.0736 <sup>a</sup> (0.007)	0.0725 <sup>a</sup> (0.007)	0.1299 <sup>a</sup> (0.008)	0.1255 <sup>a</sup> (0.008)
<b>PUB (1997)</b>	0.0954 <sup>a</sup> (0.006)	0.0957 <sup>a</sup> (0.006)	0.1451 <sup>a</sup> (0.007)	0.1461 <sup>a</sup> (0.007)	0.0742 <sup>a</sup> (0.006)	0.0736 <sup>a</sup> (0.006)	0.1299 <sup>a</sup> (0.007)	0.1260 <sup>a</sup> (0.007)
<b>PUB (1999)</b>	0.1202 <sup>a</sup> (0.006)	0.1206 <sup>a</sup> (0.006)	0.1675 <sup>a</sup> (0.007)	0.1686 <sup>a</sup> (0.007)	0.1009 <sup>a</sup> (0.006)	0.1002 <sup>a</sup> (0.006)	0.1541 <sup>a</sup> (0.007)	0.1499 <sup>a</sup> (0.007)
<b>PUB (1999)</b>	0.1326 <sup>a</sup> (0.007)	0.1328 <sup>a</sup> (0.007)	0.1795 <sup>a</sup> (0.007)	0.1802 <sup>a</sup> (0.007)	0.1167 <sup>a</sup> (0.006)	0.1160 <sup>a</sup> (0.006)	0.1695 <sup>a</sup> (0.007)	0.1652 <sup>a</sup> (0.007)
<b>PUB (2000)</b>	0.1396 <sup>a</sup> (0.007)	0.1399 <sup>a</sup> (0.007)	0.1844 <sup>a</sup> (0.007)	0.1849 <sup>a</sup> (0.007)	0.1234 <sup>a</sup> (0.007)	0.1228 <sup>a</sup> (0.007)	0.1739 <sup>a</sup> (0.007)	0.1700 <sup>a</sup> (0.007)
<b>PUB (2001)</b>	0.1667 <sup>a</sup> (0.007)	0.1669 <sup>a</sup> (0.007)	0.2191 <sup>a</sup> (0.008)	0.2195 <sup>a</sup> (0.008)	0.1516 <sup>a</sup> (0.007)	0.1510 <sup>a</sup> (0.007)	0.2106 <sup>a</sup> (0.008)	0.2062 <sup>a</sup> (0.008)
<b>PUB (2002)</b>	0.1724 <sup>a</sup> (0.007)	0.1736 <sup>a</sup> (0.007)	0.2302 <sup>a</sup> (0.008)	0.2315 <sup>a</sup> (0.008)	0.1462 <sup>a</sup> (0.007)	0.1456 <sup>a</sup> (0.007)	0.2112 <sup>a</sup> (0.008)	0.2059 <sup>a</sup> (0.008)
<b>TR*PUB</b>	0.0770 <sup>a</sup> (0.003)		0.0903 <sup>a</sup> (0.003)		0.0841 <sup>a</sup> (0.003)		0.1003 <sup>a</sup> (0.003)	
<b>TR*PUB*EDUC (INCOMPHS)</b>		0.0986 <sup>a</sup> (0.005)		0.1066 <sup>a</sup> (0.005)				
<b>TR*PUB*EDUC (INCOMPTR)</b>		0.0403 <sup>a</sup> (0.004)		0.0558 <sup>a</sup> (0.004)				
<b>TR*PUB*EDUC (COMPTR)</b>		0.0961 <sup>a</sup> (0.005)		0.1114 <sup>a</sup> (0.005)				
<b>TR*PUB*QUAL (NOQUAL)</b>						0.1007 <sup>a</sup> (0.007)		0.1050 <sup>a</sup> (0.006)
<b>TR*PUB*QUAL (OPERQUAL)</b>						0.0723 <sup>a</sup> (0.004)		0.0819 <sup>a</sup> (0.004)
<b>TR*PUB*QUAL (TECHQUAL)</b>						0.0675 <sup>a</sup> (0.004)		0.0822 <sup>a</sup> (0.004)
<b>TR*PUB*QUAL (PROFQUAL)</b>						0.1227 <sup>a</sup> (0.007)		0.1582 <sup>a</sup> (0.006)
<b>OBSERVATIONS</b>	265,673	265,673	265,673	265,673	265,346	265,346	265,346	265,346
<b>ADJUSTED R2</b>	0.459	0.459	0.459	0.459	0.467	0.467	0.467	0.467

Note: Other included variables are age, male dummy, tenure dummies, education (skill) dummies, time dummies, sector dummies, and city dummies. Robust standard errors in parentheses. (a) Significant at 1% level; (b) significant at 5% level; (c) significant at 10% level. In (1) the transfer variable is Total national tax transfers. In (2) the transfer variable is Tax national transfer due to Co-participation regime

### VI.3. Fiscal Transfers and Private Sector Wages

In the previous two sections we have shown that after controlling for personal and other characteristics, the public sector pays a wage premium relative to the wages paid by the private sector. This wage premium increases with the level of per capita transfers from the national government to local ones. In both cases, the results show that the effects are larger for the least and most educated/skilled workers, with a lower effect for workers with intermediate skills. These findings constitute evidence favouring our hypothesis that the private sector confronts a harder competition from the public sector at the moment of hiring employees in those provinces which receive larger transfers from the central government. This increasing competition from the public sector may help to explain why in these provinces the importance of footloose activities, such as the case of manufacturing production, is less important.<sup>11</sup>

The second issue we made reference at the beginning of this section was related to the question if there is a relationship or not between the level of transfers local governments receive from the federal administration, and wage rates in the private sector, more specifically those sectors which are more easily relocated among regions in the face of cost differentials, such as manufactures. To deal with this question we estimate a Mincer wage equation for workers employed in the manufacturing sector, and include as explanatory variable the level of per capita transfers received by the government of the province the worker live in. More specifically, we estimate the following two equations:

$$\ln(w_{i,t}) = \alpha_1 AGE_{i,t} + \alpha_2 (AGE_{i,t})^2 + \gamma MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i,t} + \sum_{h=2}^3 \psi_h EDUC_{h,i,t} + \theta \ln(TR_{p,t}) + B'X + u_{i,t} \quad (5)$$

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11. Excluding the province of San Luis, where the scheme of industry promotion has been, under certain criteria, very successful, there exists a negative and statistically significant correlation between Manufacturing GDP and Tax Transfers from the central government, both measured in per capita values. Further more, if we also exclude the province of La Rioja, where the large size of its manufacturing GDP is very suspicious considering other economic and social variables, the negative correlation between Manufacturing GDP and Tax Transfers from the central government becomes even stronger as well as more significant. When no province is excluded, the correlation coefficients remain negative, but they lose their statistical significance.

$$\ln(w_{i,t}) = \alpha_1 AGE_{i,t} + \alpha_2 (AGE_{i,t})^2 + \gamma MALE_i + \sum_{j=2}^5 \beta_j TENURE_{j,i,t} \quad (6)$$

$$+ \sum_{h=2}^4 \psi_h QUAL_{h,i,t} + \theta \ln(TR_{p,t}) + B'X + u_{i,t}$$

As with the previous equations, we allow for our variable of interest (TR) to interact with the education dummy variables (in the case of equation 5) and with the skill requirement dummies (in the case of equation 6). Table 8 reports the results from the estimation of equations 5 and 6. Overall, we find no statistical relationship between the wage rate in the manufacturing sector and transfers from the national to local governments. However, when we distinguish between different types of workers, there is a positive and significant effect of transfers on wages paid to workers with less formal education (incomplete high school or less), for the other two groups the coefficients are not significant. When workers are distinguished according to the skills required by the job they do, there is a positive and, in one out of two cases, significant relationship between transfers and wages for those jobs requiring no qualification or an operative qualification. In the case of jobs which requires more skilled workers, there is a negative and, in one out of two cases, statistically significant effect for jobs that requires a technical qualification. For the most skilled workers the estimated coefficients are not statistically significant. These results means that, if any, vertical transfers from the central government put a pressure on the wages paid by the private sector to workers that are at the bottom of the skill distribution.

## V. SUMMARY AND CONCLUSIONS

One of the main objectives of inter-governmental fiscal transfers in federal countries is to help alleviate regional disparities while laying the foundations for sustainable economic growth in the poorest regions. Similarly, theories from the regional economics literature predict that lower wages in the provinces would lead to higher accumulation fostering growth prospects. One striking observation in the Argentine context is that, despite the existence of a long-standing system of inter-governmental federal transfers and an excess labour supply in the poor provinces, there are no signs of economic convergence between rich and poor regions taking place.

**Table 8**  
**OLS Regressions: Private (manufacturing)**  
**wages and federal transfers. By education/skill level**

VARIABLE	(1)	(1)	(2)	(2)	(1)	(1)	(2)	(2)
TR	0.0369 (0.049)		-0.0001 (0.033)		0.0768 (0.050)		0.0270 (0.033)	
TR*EDUC (INCOMPHS)		0.0875(c) (0.049)		0.0401 (0.033)				
TR*EDUC (INCOMPTER)		0.0187 (0.049)		-0.0295 (0.033)				
TR*EDUC (COMPTER)		-0.0022 (0.051)		-0.0506 (0.038)				
TR*QUAL (NOQUAL)						0.0942(c) (0.050)		0.0344 (0.035)
TR*QUAL (OPERQUAL)						0.1100(b) (0.049)		0.0491 (0.033)
TR*QUAL (TECHQUAL)						-0.0226 (0.050)		-0.0863(b) (0.034)
TR*QUAL (PROFQUAL)						0.0121 (0.053)		-0.0536 (0.042)
OBSERVATIONS	30,844	30,844	30,844	30,844	30,809	30,809	30,809	30,809
ADJUSTED R2	0.420	0.422	0.420	0.422	0.409	0.412	0.409	0.412

Note: ohter included variables are age, male dummy, tenure dummies, education (skill) dummies, time dummies, sector dummies, and city dummies. Robust standard errors in parentheses. (a) Significant at 1% level; (b) significant at 5% level; (c) significant at 10% level. In (1) the transfer variable is Total national tax transfers.

In (2) the transfer variable is Tax national transfer due to Co-participation regime.

We argue that one likely explanation for this phenomenon is the existence of institutional wages (as opposed to productivity wages) which is explained by the prevalence of a nationwide labour market benchmark. In these conditions, the wage differential between regions is either absent or not large enough to stimulate investment and accumulation in the less favoured provinces. In line with earlier work, we also argue that this situation is the result of large federal transfers finding their way into the public administration rather than into the private sector. In other words, the private sector faces strong competition from the public sector in regional labour markets and this further discourages private investment in the provinces.

We approach our theoretical predictions using a Mincer-type equation. We find empirical support for our hypothesis that the public sector pays a wage premium relative to the wages paid by the private sector. As we expected, this premium is increasing in the level of federal transfers per capita. We find no significant evidence suggesting that federal transfers have an effect on wages in the private manufacturing sector at the aggregate level. However, when we incorporate the level of education and/or job qualification into the model, we find evidence suggesting a significant and positive relationship between federal transfers and wages paid to workers with less formal education or for jobs that requires less skilled workers. This latter finding suggests another channel through which large federal transfers discourage investment in the private sector and particularly in those activities intensive in unskilled labour.

Overall, our results in this paper confirm previous results while offering new light on the detrimental effects of an inter-governmental transfer system when regional labour markets operate in much the same way as the single nationwide labour market. Similarly, our findings go some way towards explaining the persistence of regional differences and the lack of economic convergence.

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