

The Impact of Privatisation on Wages: Evidence from the Portuguese Banking Industry*

Natália Pimenta Monteiro[†]

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Abstract

This paper adopts a *difference-in-differences* estimator to examine the impact of privatisation on wages in the Portuguese banking industry for the period 1989-97. The design of the reform and the nature of dataset employed (matched employer-employee) provided a particularly important opportunity to analyse the effects of privatisation on different demographic groups, using multiple control groups, and considering the timing of the effects. The empirical evidence suggests a U-shaped relationship between wage variation and time period of restructuring, regardless of the choice of the comparison group, for those employees, either men or women, retained by privatised firms.

Keywords: privatisation, wages, Portuguese banking industry, difference-in-differences.

Jel classification: J31, J45, L33.

1 Introduction

The impacts of privatisation on labour market outcomes are potentially substantial. On the one hand, public sector industrial relations are to some extent separate from private sector ones and have distinct features. For instance, public sector organisations tend to pursue a multiplicity of often conflicting objectives whereas private sector firms can focus more narrowly on generating

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[†]Doctoral Researcher, Department of Economics, University of Warwick, Coventry CV4 7AL, UK. Telf.: +4424 7652 8415, Fax: +4424 7652 3032, E-Mail: N.Monteiro@warwick.ac.uk

profits. In addition, public pay determination tends to respond more to political pressures rather than to markets or firm performance. In the past, public union leaders have often been able to gain advantages by exploiting public corporation managers contacts with politicians and members of government, in a near or total monopoly bargaining position. On the other hand, much of the debate about the desirability of privatisation has included labour market outcomes (employment and pay levels). In contrast to trade unions, the proponents of privatisation hope that privatisation restructuring will reduce overmanning and excessive pay levels and benefits.

However, many of the studies of privatisation to date have focused on processes and institutions. In fact, most of the work has actually been concerned with whether or not the transfer of ownership from public to private sector leads to an improvement in corporate performance¹. Important distinctions between cost/defensive and revenue/strategic restructuring have been observed by Grosfeld and Roland (1996) but the exact channels through which the expected efficiency improvements of the firm occur are still not known. Research focusing on the effects of privatisation on labour market outcomes (both theoretical and empirical) is, in general, scarce, inconclusive and almost exclusively confined to the United Kingdom experience². One exception is the (empirical) effect on the total level of employment of the firm, which is often examined in the industrial literature as an extra firm performance indicator. In respect to the impact of privatisation on wages (both employee pay and non-pecuniary benefits) there is no systematic exploration in the literature. But the scarce empirical evidence presented so far, refutes the effects that are traditionally predicted: pay levels are relatively inflexible and tend to increase above-average after privatisation (Pendleton, 1997).

This study looks at the effects of privatisation on wages in Portugal³ where public ownership was widespread. More specifically, the effects of direct transfer of ownership from public to private sector⁴, are examined in a single sector: the Portuguese banking industry. A number of different arguments form the basis of this industry selection. First, until the mid1990s, the privatisation program was asymmetric and biased sectorially. Its major incidence, in terms of number of firms comprised or in terms of volume of revenues generated, was in the banking industry (Ministério das Finanças, 1999, page 15). The privatisation comprised eleven compa-

¹The research on this topic is voluminous, see for instance, the review by Megginson and Netter (2001).

²In contrast, the effect of market's deregulation, a related policy, has deserved a relatively remarkable attention in the labour literature, although mainly reflecting USA experience. For a recent survey, see Peoples (1998).

³Portugal is classified as the third largest privatiser in the OECD countries, after the New Zealand and the United Kingdom (OECD, 1998).

⁴Although there are different forms of privatisation, this study only focus the effects of sales of public companies on wages.

nies, which accounted for more than 83% of banking employment in 1985, and raised about 3,3 billions of EUROS, the bulk (48%) of the total sales of state enterprises until the second quarter of 1995. Moreover, the privatisation of the whole industry was started and completed between 1989 and 1996, whilst it is less advanced and still ongoing in some other economic sectors. In addition, the developments of the Portuguese financial sector, privatisation and deregulation, are considered a remarkable success: “the main reform objectives were met” without “the *concomitant financial instability* experienced by many other OECD countries” (OECD, 1999, page 94).

Second, the design of the privatisation program and the structure of the banking sector provide a notable and promising opportunity to evaluate the economic effects of a change in ownership. Indeed, in contrast with the remaining industries, the privatisation in the financial sector did not affect all public firms. There still continues to be a large state-owned financial group, which provide us with a valuable natural candidate as a control group to examine the effects of the reform. Moreover, the Portuguese banking industry structure is diverse (as will be described below) allowing a variety of possible ways of defining a control group, and therefore provides multiple and fruitful comparisons.

Finally, although there is little research focusing on the banking labour market, prior research provides evidence of rent-sharing behaviour in the industry, which potentially raises the privatisation effect. In fact, the structure and the industrial relations in the banking industry (namely role of unions, level and trend of unionisation density, wage bargaining mechanisms, firms size and ownership structure) contrasts sharply with those prevailing in the remaining sectors. Given these dissimilarities, the effects of privatisation are likely to differ across industries. Comparison of the effects of privatisation in different sectors is beyond the scope of this study. Therefore, this work only focuses on the case of privatisation in banking industry.

This study uses individual-level data from a particularly appropriate dataset collected annually by the Portuguese Ministry of Labour and Solidarity, *Quadros de Pessoal*, to evaluate the impact of privatisation on the wages of workers whose firms were transferred from the state to the private sector. The longitudinal nature of the dataset allows us to build a panel dataset covering a period before and after the reform and a difference-in-differences estimator is adopted to infer the impacts of the policy reform.

This work is structured as follows. Next section 2 reports critically the findings of recent studies (theoretical and empirical research) concerning the impact of privatisation on wages. It also includes related literature such as wage differentials in public and private sectors with particular reference to Portuguese industrial sectors. The following section 3 explores the historic

context of the privatisation reform and discusses the singularity of the banking labour market in the context of the Portuguese economy. Section 4 describes the methodology implemented to evaluate the effects of the policy reform. The description of the data used and the empirical evidence/results are outlined in Section 5. The last section summarises the main conclusions of this study.

2 Privatisation and Wages: Theoretical and Empirical Literature Review

The theoretical literature regarding the effects of privatisation on wages although fairly limited is not consensual. In the first model developed (Haskel and Szymansky, 1992 and 1993), privatisation implies a shift in the public firms' objective function towards profit maximisation and a reduction on the union bargaining power. As a result, a convergence of pay levels between privatised and other private firms is expected to occur. This result confirms the prediction made from the well established public/private wage differential literature: if on average, workers with similar attributes are better paid in the public sector than in the private sector, then privatisation will put the former in a worse position. In contrast, the predictions which emerged from the subsequent works, resulting from either extensions of the previous model (Haskel and Sanchis, 1995) or using completely different analytical frameworks (De Fraja, 1993 and Goerke, 1998) are ambiguous. Wages may either increase or decline, depending on the assumptions made regarding the firms' market power, unions role and nature of wage determination.

Apart from these models, which look at the effects on the overall wage distribution, there is a vast growing literature concerning the conditions that effect the remuneration of one specific occupation: top or chief executive managers⁵. According to this line of reasoning, the compensation of top managers/executives tends to rise after privatisation as pay scale constraints are released, executives are more explicitly linked to observable measures of firm performance and have more bargaining power. In addition, if privatisation is associated with an increase in the firm scale, managers have direct oversight of more activities, and hence may expect a higher remuneration.

The empirical evidence concerning the effects of privatisation on wages does not generally reflect the diversity of results predicted by the theory. In fact, the work by Bishop and Kay (1988), Haskel and Szymansky (1993) and Parker and Martin (1996) with reference to the United

⁵See for example Rosen (1992) for both theoretical and empirical survey.

Kingdom, the work present by La Porta and Silanes (1999) relating to the Mexican economy and the recent work by Brainerd (2002) regarding privatisation in Russia, show an unanimous pattern: average real (employee) wage tends to increase after privatisation, whenever the control group is defined as the private/public sector or the whole economy.

This striking finding should nevertheless be treated with some caution for different reasons. First, excluding the recent work by Brainerd (2002), all previous research presented so far used data collected from company accounts. Thus, an increase in the average wage (calculated as wage costs divided by the total level of employment) over time, can be distorted by changes in the hours worked or changes in the composition and attributes of the workforce. For instance, if firms disproportionately fire low wage workers after privatisation, then the average wage may rise. Moreover, even if workforce composition remains constant, the wage increase might reflect wage increases in narrow and specific occupations such as top or executive managers. Second, the monopolistic position of many of the privatised firms studied, makes it impossible to compare them with similar industry-matched firms. In this case, the comparison with the whole economy may not allow us to isolate privatisation effects from specific industry factors (only from the business cycle). As Parker and Martin (1996) referred “*each privatised company has its own particular performance determined by the environment in which it operates*”. Finally, in all but Parker and Martin’s (1996) work, the timing period of post privatisation analysis varies widely, spanning from 3 to 6 years, according to the privatisation date of each firm. As a consequence, transitional and long term privatisation effects can not be separated and these might be quite different⁶.

The empirical literature on the executive labour market corroborates the predictions suggested by the theory. Although the main focus of this work relies on finding which is the best explanation, among competing theories, to account for changes in executive remuneration, all research seems to confirm a significant increase on the wage level of executive managers after privatisation. For instance, Wolfram (1998) reports a wage increase of 200% for the chief executive officers after privatisation of British electricity industry. The same conclusion is obtained when a broader concept of executives is used. For example, Bishop and Kay (1988) detected an increase of 173%, 79% and 81% on the director remuneration on 12 privatised firms, 5 public firms and a sample of leading private companies, while La Porta and Silanes reported a relative wage increase of 47% for white collar employees.

There is little research explicitly concerned with the Portuguese banking labour market. In

⁶Gupta *et al.*(2001) discuss the impacts of privatisation on labour outcomes over time and Villalonga (2000) detects opposite privatisation effects on efficiency when the analysis includes a timing dimension.

particular, Vieira *et al.* (1997) and Kiker and Santos (1991) attested to a significant but unstable wage premium to banking workers relative to the average paid by other industries. Apart from this, there is further (but indirect) evidence of rent-sharing behaviour in banking industry. In fact, while Portugal and Centeno (2001), found that the public/private wage differential in Portugal is the widest within European countries, Vieira *et al.* (1997) points out that there is a significant wage premium to large firms and for workers covered by collective bargaining agreements - these are two important features of banking industry as will be discussed in the following section.

3 The Portuguese Banking Industry

The Portuguese banking industry was subject to a nationalisation process, between 1974 and 1976, which entirely changed the firm ownership structure in the country. Before 1974, the economy was dominated by seven large national private conglomerates which controlled most of the economy, around 75 per cent of the GDP and 99.6 per cent of total deposits in the financial system (Sousa and Cruz, 1995). These conglomerates were then dismantled. As a result, all institutions in the banking sector (in the total 24 organisations) were expropriated and became public. Only foreign-owned banks and very small financial institutions escaped from this reform.

During this period, the State interference was also reinforced by a number of legal changes enacted for the purpose of establishing a scheme of heavy regulation. These include the establishment in the Constitution that the process of nationalisation was *irreversible*, a law blocking free entry into the industry and the imposition of tight restrictions on banking operations such as credit ceilings and limits to deposit and credit rates. Even long after, when complete restrictions to free entry were removed in 1984, the State was still omnipresent in the banking industry: public-owned banks employed 95 per cent of banking workers in 1988, the highest proportion of public workers of any European country while it accounted for 80 per cent of the banking market in 1989 (OECD, 1994 and OECD, 1991).

Privatisation reform introduced substantial changes in the ownership structure of this industry. Accelerated by economic and political stability (achieved for the first time, since the nationalisation period) and by an exceptional boom in 1986/87 in the usual thin stock market, the first law permitting partial privatisation was adopted in 1988 (law 84/88 from 20th July). In April 1990, after the second Constitutional Amendment was laid down in June 1989, the *lei Quadro das Privatizações*, (decree-law 11/90 from 5th April) was passed allowing full privatisation of enterprises nationalised after 1974.

The privatisation program started in the financial sector given the advanced liberalised stage prevailing in the industry and its strategic position with regard to the development of the remaining economic sectors. In addition, the success of privatisation reform depended largely on the level of development of the capital markets. In contrast with some other economic sectors, and in part because other profound challenges that have occurred in this sector (namely deregulation and technological development) the government opted for a policy of no interfering in the public banks during the period before privatisation (Naumann, Reinhard (1995) and Sousa and Cruz (1995)), leaving the economic restructuring for future private owners.

In terms of scheduled order of privatisation, firms were selected among those with a solid financial base operating according to the market rules (OECD, 1989). In practice, the timetable was affected by the economic and political cycles' and by the international context (conflict in Persic gulf in the end of 1990). Table 1 includes the number of banks in the industry, categorized by ownership owner, between 1988 and 1997.

Table 1: Ownership structure in the banking industry

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Public	12	11	10	8	7	6	3	3	2	2
Privatised*	0	1	2	4	5	6	9	9	10	10
Private	27	27	28	26	29	32	36	36	40	43
National	22	19	18	14	16	18	22	23	23	28
Foreign	5	8	10	12	13	14	14	13	17	15
Total	39	39	40	38	41	44	48	48	52	55

*The date of first tranche sell of each firm is considered the date of effective privatisation.
Source: Computations based on Portugal, MTS (from 1988 to 1997)

During eight years, ten⁷ out of the twelve public banks gradually became fully private. These banks, which are included in the *privatised* category, are large long-established institutions of more than 100 years old that employ on average about 3500 workers during the analysis' period . These institutions were initially private, became public via nationalisation process, and were then privatised. In most cases, ownership rights were re-acquired by the Portuguese groups,

⁷Despite there were 11 and not 10 banks that were privatised between 1989 and 1997, I worked with only 10 banks. Two banks were excluded from the initial list. One bank didn't appear in the data, while the other bank was eliminated from the analysis because although privatised it was never a state firm. Rather, it resulted from the transformation of a mutual agricultural credit cooperative into a bank in which the state had a minority participation (15%). I also comprised the indirect privatisation of a public bank thorough the privatisation of the group to which it belongs (Ministério das Finanças, 1999, page 22)

which had owned them prior to the nationalisation wave (OECD, 1994). Due to this *private-public-private* ownership path, privatisation reform in Portugal is termed as *re-privatisation*. The remaining two public banks are included in the *public* category. Despite also including long-established institutions, this group is more heterogeneous: at the end of the reform, it comprises the largest institution in the market (around 10 000 employees) that was always in public hands and a smaller institution (around 4000 employees) that became public after the nationalisation wave. In contrast with previous categories, the group of *private* banks consists mainly of newly arrived⁸, national or foreign, small firms (average around 200 employees).

The developments at the ownership level conditioned the type of industrial labour relations in the industry. In particular, the structure of the unions and the decentralised mechanisms of wage setting are unique to Portugal. Covering three different geographical areas, the oldest labour unions in the mainland⁹ represent *all* banking employees in the wage bargaining process, *regardless of the ownership* of the bank. In fact, banking labour unions and a group of employers, public and private (national and foreign), or their representatives meet each year to negotiate the *vertical collective bargaining agreement*. This collective agreement, the most detailed and extensive in Portugal, regulates the employability conditions (age and level of education), the systems of remuneration and the normal number of workhours in the industry. In particular, it delimits the starting wage level and the compulsory wage progressions for each of the 18 *levels* in the 4 groups defined to cover *all* the banking workforce. Firms are not obliged to subscribe to all parts of the agreement, exemptions are mentioned at the end of the bargaining contract¹⁰.

Beyond this broad scope of the collective agreement, banking unions also have the monopoly of providing a recognised health system supporting both active and retired employees. Therefore, it is not surprising the strong attachment to unionism existent in the sector. In fact, this labour segment displays the highest unionisation density in the economy. Furthermore, in contrast with the decline of unionisation density in most economic sectors, the average unionisation rate in the banking sector has been expanded markedly between the period 1974-78 and 1991-95, from 71% to 106%, Cerdeira (1997).

Despite this notable reinforcement of the union power, banking trade unions did not act against privatisation. The resistance offered was very limited, not co-ordinated, mostly being made through internal speeches and pamphlets which rarely reported in the national press. An

⁸ After the openness of the market to new entries in 1984.

⁹ There is also a recent union, *Sindicato dos Quadros Técnicos Bancários*, covering different professional categories in the banking industry.

¹⁰ Foreign firms are more likely to not subscribe all parts of the agreement.

interesting indicator of the tranquillity existent in the banking sector is the total absence of any strike action (see Portugal, MTSS) during a turbulent period, between 1985 and 1997, marked by lasting challenges: liberalisation, privatisation and technological advance.

Table 2: Mean characteristics of banking employees by firm ownership

Variables	Time	Public	Privatised	Private	
				National	Foreign
Log hourly wage*	1989	7.20 (0.33)	7.13 (0.35)	7.25 (0.47)	7.55 (0.55)
	1997	7.49 (0.33)	7.44 (0.37)	7.45 (0.48)	7.72 (0.49)
Years of schooling	1989	9.7	9.2	10.5	10.7
	1997	10.9	10.6	12.3	12.8
Age	1989	40	41	35	37
	1997	41	44	36	37
Tenure	1989	13	14	8	10
	1997	15	17	7	7
% Female	1989	34	24	17	40
	1997	41	29	33	25

*Wages are inflated to 1998 level using the Consumer Price Index. Standard deviation in paratheses.
Source: Computations based on Portugal, MTS (1989, 1997)

In terms of earnings and individual attributes, Table 2 exhibits the major trends during the period of privatisation for the four firm categories described above. As the table reveals despite the fact that this period was characterised by a strong increase of the real wage in the industry, privatisation led to a convergency on the hourly pay level between privatised, public and private national firms. On average, hourly wage increased more (31 percent) in privatised firms when compared to public (29 percent), national (20 percent) or foreign firms (17 percent), between 1989 and 1997. This increase is even more impressive when the level of schooling and tenure are taken into account. In fact, employees in privatised firms, who are substantially better paid, are the oldest, the least educated and the most experienced in the banking sector. Hence, this result confirms the findings of previous literature: if one doesn't control for changes in the attributes/composition of the labour force and for the timing of the effects, privatisation leads to a remarkable increase in the wage level whenever public or private (national or foreign) firms are used as control groups.

4 Econometric Considerations

This study estimates the impacts of privatisation on the wages of workers, whose firm's ownership was transferred from state to private hands. In particular, for those affected by the reform, the main question is: what would their wage have been if the privatisation program had not been introduced? The design of the policy reform previously described in previous section 3 makes the difference-in-differences¹¹ approach a natural one to take. This approach considers the privatisation reform itself an experiment, *the treatment*, and tries to find a naturally occurring *comparison* group that could reflect the properties of a control group in a properly designed randomised social experiment. The average effect of the reform on the individuals whose firms were privatised, also referred to as the *effect of the treatment on treated*, is recovered by comparing the difference in average behaviour before and after the reform for the *treated* with the before and after behaviour of the *comparison* or *control* group. Thus the selection of the comparison or control group becomes a central part of this evaluation procedure.

To be more precise about the evaluation procedure, define by W_{ijt}^1 the logarithm of wage for individual i in firm j at time t if firm j is exposed to the privatisation reform (treatment) and W_{ijt}^0 to be the logarithm of wage of individual i in firm j at time t if firm j is not exposed to the treatment. Thus the impact for the i - th individual of the policy is $W_{ijt}^1 - W_{ijt}^0$. The average privatisation effect for those individuals whose firms' ownership was transferred from state to private hands ($FO_j = 1$, if ownership of firm j was transferred to private sector, = 0 if not) is one's main question, $E(W_{ijt}^1 - W_{ijt}^0 | FO_j = 1)$. Clearly, the evaluation problem in observational studies can be regarded as a missing data problem since one can not estimate $E(W_{ijt}^0 | FO_j = 1)$ directly. Suppose that $t = 0$ and $t = 1$ represent respectively the period before and after the implementation of the reform. The key identifying assumption of this approach consists of,

$$\begin{aligned} E(W_{ijt}^0 | FO_j = 1, t = 1) - E(W_{ijt}^0 | FO_j = 1, t = 0) &= \\ E(W_{ijt}^0 | FO_j = 0, t = 1) - E(W_{ijt}^0 | FO_j = 0, t = 0). & \end{aligned} \quad (1)$$

This assumption implies that the change in the logarithm of wage in firms whose ownership was transferred from state to private hands, would have been the same as in the other firms that belong to the control group, if the privatisation reform had not taken place. Equivalently, the wage growth over time is the same for each group in absence of the reform. In this case, the

¹¹This approach is widely used to evaluate "interventions" of this nature in different contexts. See for example Card and Krueger (1994).

missing counterfactual value can be replaced by,

$$E(W_{ijt}^0 | FO_j = 1, t = 1) = E(W_{ijt}^0 | FO_j = 1, t = 0) + \theta,$$

which is simply the logarithm of wage level in state firms that would become private, before the privatisation, adjusted for wage growth in the control group given by,

$$\theta = E(W_{ijt}^0 | FO_j = 0, t = 1) - E(W_{ijt}^0 | FO_j = 0, t = 0).$$

This gives rise to a straightforward difference-in-differences estimator,

$$\begin{aligned} \theta &= E(W_{ijt}^1 - W_{ijt}^0 | FO_j = 1) \\ &= \mathbb{E} E(W_{ijt}^1 | FO_j = 1, t = 1) - E(W_{ijt}^0 | FO_j = 1, t = 0) - \\ &\quad \mathbb{E} E(W_{ijt}^0 | FO_j = 0, t = 1) - E(W_{ijt}^0 | FO_j = 0, t = 0). \end{aligned}$$

Clearly, the first key identifying assumption in the difference-in-differences estimator requires common time effects across all groups. If macro time effects have differential impacts across groups, then the difference-in-differences estimates will not remain valid¹².

Under this assumption, the difference-in-differences estimator can also be obtained by a regression using micro data pooled across all treated and control groups and all time periods,

$$W_{ijt} = \beta_0 + \beta_1 FO_{ij} + \beta_2 A_t + \beta_3 FO_{ij} * A_t + \alpha_i + \gamma_j + \varepsilon_{ijt} \quad (2)$$

where $FO_{ij} = 1$ if individual i belongs to a firm j subject to the privatisation reform, $FO_{ij} = 0$ otherwise. A_t is a set of time dummies that identify for each individual the period after ($A_t = 1$) and before ($A_t = 0$) the implementation of the policy reform. The unobservable term is specified to be $\alpha_i + \gamma_j + \varepsilon_{ijt}$, where the term α_i captures the effects of unobserved time-invariant person characteristics, γ_j refers to the unobserved time-invariant firm effects and ε_{ijt} is assumed to be a white noise term.

Under this setup, it is also clear that the validity of this estimator also depends on the implicit composition of the error term. In particular, if the expected logarithm of wage conditional on the treatment status depends on transitory individual-specific components, then the difference-in-differences estimator will be inconsistent¹³. This can happen if individuals adjust their behaviour in response to the introduction of the reform. For instance, if high skilled workers self select or migrate after privatisation from public to privatised firms. Hence, special care is needed when choosing the individuals that form both the control and treatment groups.

¹²See Meyer (1995) for a detailed list of “threats to validity” of this estimator.

¹³See Blundell and Dias (2000) for a precise description of this condition.

In this specification, both treated and control groups are identified by one single dummy variable. When there are more than one control group, it is also required additional dummies variables to identify each group and its interaction with time period dummies.

This simple difference-in-differences approach can also be extended, by adding a vector of individual characteristics, in order to control for differences in observable attributes between groups. In this case, the “adjusted” difference-in-differences estimator is obtained by the following wage equation,

$$W_{ijt} = \beta_0 + \beta_1 FO_{ij} + \beta_2 A_t + \beta_3 FO_{ij} * A_t + \phi X_{ijt} + \alpha_i + \gamma_j + \varepsilon_{ijt} \quad (3)$$

where X_{ijt} represents a vector of observable attributes of individual i in firm j at time t . The coefficient of primary interest is the coefficient of $FO_{ij} * A_t$, which corresponds to the difference-in-differences estimator. It indicates the percentage variation in the wage differential between the treated and control groups during the period considered. This effect here is termed as *privatisation* or *ownership* effect.

5 Data and Empirical Results

The difference-in-differences estimator laid out above is obtained using individual-level data from a particularly appropriate dataset, *Quadros de Pessoal*, collected by the Portuguese Ministry of Labour and Solidarity. This is an extensive database of matched employer-employee information based upon mandatory employer reports. It provides detailed information about each unit, firm or employee, observed. For instance, information about location, total level of employment, economic activity, type of management, total sales and social capital is available for each firm. For each employee, gender, date of birth, level of schooling, occupation, full-time/part-time status, earnings, duration of work and the mechanism of wage bargaining are known, as well as the location and industry of the employing firm.

The creation of the analysis data set involved the selection of the individuals that form both the control and treatment group, the definition of the time period of analysis and the construction of the outcome variable(s) of interest from the variables already in the data set. Following the principle “the more comparison groups the better”, (Meyer, 1995), this study uses information about wages from the four firm categories that prevail in the banking industry (described in section 2) to perform the analysis. Public, private national and private foreign firms (hereafter referred to just as national and foreign firms, respectively) are defined as the three comparison/control groups while privatised firms constitute the treatment group. Thus,

as all firm groups belong to the same sector, it is guaranteed to equate macro trend effects across groups¹⁴.

Public firms form the natural candidate control group given their ownership. On the other hand, comparing the change in the wage differential with private (national and foreign) firm groups can be viewed as measuring the wage effort of catching up with the wage pattern paid by these groups. This is particularly appealing when private national firms are considered. As mentioned in section 3, almost all new owners of privatised firms were the previous owners before the nationalisation wave took place in the 1970s. Foreign firms appear as a neutral control group as they were not subject to the reform but experienced common macro effects.

In terms of the time period for performing the analysis, the first step consisted of drawing individual information from banking employees and firms for the period between 1989 and 1997. This selection of the time period was based on the economic context of the banking sector. The year 1989 corresponds to the beginning of a competitive environment¹⁵, ¹⁶ in the banking market, whilst 1997 is the last year of analysis as the privatisation reform finished in 1996 and during 1998 the first merger in banking industry involving recently privatised firms occurred.

In the second step, after selecting the control and treatment firm groups for each of the ten firms privatised, samples including employees that remained in all firm groups after t years of the implementation of privatisation (year 0) were extracted¹⁷. In particular, independent samples were constructed for each t varying between one and four years. Thus, the effects of the reform are examined on 63%, 51%, 46% and 43% of the total banking workforce after one, two, three and four years, respectively, of the introduction of privatisation. This choice is particularly convenient in order to control the effects of individual self selection and worker mobility within firms during the period of the analysis. The sample is restricted to those employees aged between 18 and 65 according to the vertical collective agreement definition. Only observations with missing variables needed to perform the analysis were dropped.

The logarithm of hourly wage was used as output measure¹⁸. This was computed as the

¹⁴Implicitly, it is assumed common effects for firms with different portfolio of customers, namely, consumers and firms.

¹⁵The deregulation process of the financial system started in 1984 but by the time privatisation was implemented (1989) most of the price and entry barriers had already been removed, although the complete freedom was not reached until the end of 1992 (OECD, 1999).

¹⁶This choice is not particularly disturbing since the privatisation of the first bank started on the 10th of July of 1989 whereas the inquiry occurred in March

¹⁷As mentioned previously on section 3, restructuring occurred after and not before the implementation of the reform. Also note, that now, t doesn't correspond to a calendar year.

¹⁸This variable is commonly used in the related literature of the impact of market's deregulation on wages. See

logarithm of the sum of monthly base wage plus the regular and irregular components of the wage¹⁹, payment indexed to tenure and overtime divided by normal and extra hours worked. Wages were converted to real terms (1998 prices) using a consumer price index.

In the presence of a balanced panel built as described, the difference-in-differences estimator may also be obtained by differencing from period 0 equation 3, previously adjusted to include three comparison or control groups. In practice, a separate equation²⁰, ²¹ was estimated for each t equals to 1, 2, 3 and 4,

$$W_{ijt} - W_{ij0} = \lambda_0 + \lambda_1 P_{ij} + \lambda_2 N_{ij} + \lambda_3 F_{ij} + \phi(\mathbf{X}_{ijt} - \mathbf{X}_{ij0}) + \sum_k \delta_k + \varepsilon_{ijt} - \varepsilon_{ij0} \quad (4)$$

where P_{ij} , N_{ij} and F_{ij} are binary variables that identify if individual i works in a privatised, national or foreign firm j , respectively. The workers from public firms form the omitted group. In this specification, λ_1 corresponds to the difference-in-differences estimator from equation 3, β_3 , when public firms form the control or comparison group. When national (foreign) firms work as control group the difference-in-differences estimator is given by $\lambda_1 - \lambda_2$ ($\lambda_1 - \lambda_3$). The vector \mathbf{X} includes control variables for the number of schooling years (education), seniority, potential experience and its square, logarithm of firm size and logarithm of total duration of work²². The term $\sum_k \delta_k$ consists of time dummy variables added to the specification in order to account for differences in the economic cycle during the time period of privatisation. Looking at Table 1 and when $t = 1$, this term would represent six indicator variables according to each privatisation date. Given the omission of the year 1990 in the dataset, the term $\sum_k \delta_k$ corresponds either to five (when $t = 1$), four (when $t = 2, 3$) or three (when $t = 4$) binary variables.

Table 3 and 4 provide the results of the estimated privatisation effect on wages for men and women, respectively. As discussed previously in section 2, for these two demographic groups, for example, the work by Black and Strahan (2001) that examines the effect of deregulation on earnings in the American banking industry. Nevertheless, there are no substantial changes when monthly wage is alternatively used.

¹⁹ Irregular component of the wage relates to the amount paid in March relative to Christmas, holiday or other irregular subsidies while regular component of the wage includes the allowances paid such lunch, transportation, lodging, children or productivity premia.

²⁰ This flexible specification allows different structure of real wage-change over time is referred in Heckman and Hotz (1989). McGuckin and Nguyen (2001) applied this specification to explore the effects of ownership changes on wages and employment, using plant-level data.

²¹ The potential endogeneity of privatisation is not addressed here, given the missing firm's key variables in the dataset, namely total sales and social capital, for the period and industry covered.

²² Other variables such as regional dummies, bargaining regime status, part-time status and occupation indicators although available from the data were not, individually and jointly, statistically significant and thus, excluded from the analysis.

the expected theoretical effects of privatisation are ambiguous. In the following table, each row corresponds to the difference-in-differences estimate of the effect of privatisation according to the control group specified on the left handside of the table. For example, the figure -.084 (first row, second column) from table 3, indicates an erosion of 8.4-percent²³ on the wage differential of retained men by privatised firms when compared to retained male employees in public firms, after two years of the introduction of the reform.

Table 3: DinD estimates of the impact of privatisation on log hourly wage of men

	Time Effect	+ 1 year	+ 2 years	+ 3 years	+ 4 years
Control Group					
Public		-.074 (.003)	-.084 (.004)	-.058 (.004)	.086 (.004)
National		-.033 (.002)	-.091 (.003)	-.110 (.003)	-.040 (.004)
Foreign		-.037 (.009)	-.070 (.005)	.055 (.016)	.158 (.028)
Sample Size		110,601	69,388	53,064	33,752

Notes: Robust standard errors in parantheses. All coefficients are significant at the 1 percent level.

As Table 3 reveals, the effects of privatisation, in contrast with previous literature, varied according time and control group considered. Nevertheless, one can detect an obvious U-shaped relationship between time of restructuring and wage variation rate regardless the choice of the control group, confirming the existence of privatisation dynamic effects detected by Villalonga (2000). In fact, men experienced negative wage growth rates during the first two years after privatisation, which were clearly reversed in the subsequent period.

These wage growth losses were particularly intense after two years of implementation of the reform, although quite similar across the three comparison groups. This result supports the general objective of restructuring (cost reducing) implicit in the implementation of the policy and indirectly confirmed by Pinho (1999). This author detected for the Portuguese banking industry, a significant improvement in the efficiency level between 1988-97, more pronounced among the privatised institutions. Moreover, this result is also consistent with McGuckin and Nguyen (2001) findings regarding the effects of ownership changes in the US manufacturing sector: around 76% of employees experienced lower wage growth rates after the ownership change. On the other hand, deregulation of the product market, a related policy implemented in order to increase market's level of competitiveness, yields in general to declines in the wage growth rate. For instance, Black and Strahan (2001) find that in the US banking industry male

²³The tables already present wages differentials in percentage calculated as $(e^{coefficient}-1)$.

wages fell by 12.5 percent

Three years post-reform the effects of privatisation are mixed whereas in the fourth year after privatisation wages grew faster for those workers who retained their jobs in privatised firms when compared to public or foreign firms, respectively. For this period of analysis, the results are then comparable to those found by Parker and Martin (1996) despite the fact that their analysis include all workforce regardless the gender. These authors find that after four or five years privatisation, wages on average, had increased more between 0.0 and 8.4 percent in 7 out 11 privatised firms in UK, when compared to whole economy.

These results then reflect a change in the pay policy of privatised firms. In fact, after firms have completed the main adjustments (elimination of redundant labour force and reduction of wage growth), the remaining and more likely productive labour force has to be rewarded in order to reduce turnover. In line with efficiency wage theories and due to the higher homogeneity of the employees (in terms of observable characteristics) prevailing in the four firms' categories, privatised firms have to pay higher wage growth rates in order to equate the wage level paid by the remaining firms (either public or private) in the industry. On the other hand, workers may also had employed a recognized higher level of effort and thus increased productivity, as a response of fearing an eventual threat of dismissal given the uncertainty introduced by the reform.

Table 4: DiD estimates of the privatisation impact on log hourly wage of women

	Time Effect	+ 1 year	+ 2 years	+ 3 years	+ 4 years
Control Group					
Public		-.030 (.004)	-.106 (.006)	-.057 (.006)	.043 (.007)
National		-.027 (.003)	-.090 (.005)	-.097 (.005)	-.052 (.008)
Foreign		-.043 (.010)	-.080 (.014)	.079 (.020)	.176 (.033)
Sample Size		41,551	23,948	19,480	13,209

Notes: Robust standard errors in parantheses. All coefficients are significant at the 1 percent level.

For women, similar conclusions can be inferred from Table 4. In particular, the same U-shaped relationship between wage variation and time restructuring is observed, regardless of the choice of the control group. Wage growth cuts are again stronger and analogous across comparison groups after two years of the reform. The major difference is that the intensity of wage decline with respect to public firms is lower to women in the first year of analysis. This difference may reflect a less favourable wage differential between privatised and public firms for

women than men before the implementation of privatisation. As a result, women felt a lower wage decline when compared to public firms in the first year.

The results presented so far regarding the effects of privatisation on male and female workers are surprising, as they seem to contradict the predictions of the Gary Becker model that product market competition drives out gender discrimination. If this were the case²⁴, then women, who earn on average less than men, would have improved their relative position either experiencing lower wage losses or stronger wage gains, according to the timing of the effects. Unless strong composition effects occurred at the same time as privatisation, such as relatively more women moving into higher skilled occupations after privatisation, the results shown above would corroborate Gary Becker's prediction. Nevertheless, the variable variation in occupation was not significant in equation 3, which rules out this hypothesis.

Table 5: DiD estimates of the privatisation impact on log hourly wage of managers

Time Effect	+ 1 year	+ 2 years	+ 3 years	+ 4 years
Control Group				
Public	-.087*** (.012)	-.162*** (.019)	-.207*** (.022)	-.029 (.022)
National	.009 (.008)	-.132*** (.016)	-.164*** (.016)	-.095*** (.020)
Foreign	-.098*** (.024)	-.160*** (.022)	-.143*** (.038)	-.088 (.079)
Sample Size	7,702	4,742	3,573	2,087

Notes: Robust standard errors in parantheses. *** Statistically significant at the 1 percent level

Next Table 5 contains the results for male managers. Following Lopes and Silanes (1999) work, a broad concept of top managers was adopted including only those managers that performed the same function before and after the implementation of the reform. For this group, the theoretical predictions point to a clear increase in the wage growth rate. Surprisingly, the empirical evidence indicates the opposite effect. The wage differential has been reduced significantly during the period of wage decline previously identified. Further, the magnitude of the slower wage growth, between 13 and 16 percent, is substantially larger than the wage loss detected before. In addition, the evidence on wage growth gains after the second year are less compelling.

These findings may suggest that this group had been enjoying substantial rents before the

²⁴Research on the impact of the market's product deregulation on racial and gender discrimination, is typically supportive of shrinking differentials. For instance, Black and Strahan (2001) reports that in the US banking industry wages fell by 12.5 and 2.9 percent, for men and women respectively, after branching deregulation.

Table 6: DiD estimates of the privatisation impact on log wage components of managers

		Public	National	Foreign	Sample
Time Effect	Wage Components				
+ 1 year	Effective hourly wage	-.00* (.005)	.00 (.005)	-.03 (.021)	7,702
	Irregular subsidies	.48* (.203)	.09 (.204)	-.26 (.203)	1,530
	Regular subsidies	.04** (.020)	.18*** (.017)	.08 (.031)	7,366
+ 2 years	Effective hourly wage	.01 (.007)	-.09*** (.006)	-.02 (.013)	4,742
	Irregular subsidies	-.83*** (.423)	-.73*** (.415)	-.84*** (.471)	853
	Regular subsidies	.12*** (.033)	.11*** (.028)	.27*** (.032)	4,437
+ 3 years	Effective hourly wage	.05*** (.011)	-.08*** (.009)	-.01 (.024)	3,573
	Irregular subsidies	-.91*** (.613)	-.54 (.652)	-.70*** (.431)	483
	Regular subsidies	-.39*** (.054)	-.39*** (.043)	-.49*** (.073)	3,435
+ 4 years	Effective hourly wage	.17*** (.016)	-.03* (.018)	-.05 (.055)	2,087
	Irregular subsidies	-.67*** (.298)	-.40 (.449)	1.34 (.903)	287
	Regular subsidies	.35*** (.075)	-.17*** (.072)	-.51*** (.147)	2,057

Notes: Robust standard errors in parantheses

***, ** and * denote statistically significant from zero at the 1, 5 and 10 percent levels.

implementation of the reform. In order to examine the robustness of this hypotheses, the equation previously specified was also estimated considering each of the three components of the logarithm of hourly wage. In particular, the equation was estimated using the logarithm of the *hourly effective wage* as defined by the vertical collective agreement, the logarithm of irregular subsidies and the logarithm of regular subsidies of the wage. Table 6 presents the difference-in-differences estimates for these three wage components.

As suspected, two or three years after the introduction of the reform, the main driving force explaining the wage differential decline was the irregular component of the wage. In fact, during this period, the irregular wage subsidies differential was reduced between 73 and 91 percent. However, this was observed only for a narrow subsample of managers. For the remaining managers, the pattern is not clear unless the effects are examined three years post-reform. These results are however, not free from criticism. Although there is no recorded data, it is well-known that in the banking industry, managers enjoy fat bonuses not included in their

cash compensation such as free car or excellent insurance schemes.

6 Concluding Remarks

This paper has examined the impact of privatisation on wages in the Portuguese banking industry for the period 1989-1997 using individual-level longitudinal data from *Quadros de Pessoal*. The design of privatisation reform and the quality of the data employed, allows us, not only to overcome the main limitations of the previous labour market privatisation literature, but also to improve it in a number of ways.

Firstly, because privatisation reform did not affect all public banks and the structure of the industry is diverse, the effect of privatisation is evaluated taking into account three comparison firm groups within the banking sector. Thus, the comparison with groups within the same industry guarantees, in principle, that the impact of any other economic factor not controlled for can be adequately eliminated by the difference-in-differences estimator.

Secondly, the quality/nature of the matched employer-employee dataset let us to built a balanced panel data and thus, analyse the privatisation impacts on *dimensions* not yet explored. The effects were examined on those individuals who remained in privatised firms after the introduction of the reform. In particular, the effects were analysed on three different demographic groups: men, women and male top managers. Further, in contrast with almost previous research, this paper uses the *actual* instead of estimated (total labour costs divided the level of employment) wage paid to individuals and also uses human control variables. Finally, the longitudinal nature of dataset permits us to assess the magnitude of the privatisation effects over time. The effects of privatisation on wages were examined after one, two, three and four years of its introduction.

The main lesson of this study is that the time dimension of analysis is highly important. For both men and women, a clear U-shaped relationship between time of restructuring and wage variation was found, regardless of the choice of the comparison group. During the first and second years after the introduction of reform, both demographic groups experienced similar wage losses, which were reversed after the third year. Hence, the results presented in this study confirm the previous research if long term effects are considered. Nevertheless, wages in privatised firms, again for both men and women, tend to align with the pattern paid by the remaining firms in the industry. Estimates for managers surprisingly contradict the theoretical predictions as this group experienced stronger and lasting wage growth losses than the overall distribution.

There are at least two areas of further work. First, the effects of privatisation on wages have

been examined on those workers who kept their jobs in the same firms in the banking industry. A full evaluation needs to consider the wage variation of banking workers that moved to firms in and out of the industry after the reform. A second hypotheses includes the analysis of whether or not privatisation led to different remuneration of observable individual attributes.

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