

Wage adjustments during a severe economic downturn¹

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ABSTRACT

In this article we present the recent developments of the wage distribution in Portugal. The behaviour of nominal wages reflects the effect of a severe contraction of economic activity which translated, above all, into a marked increase in

the proportion of zero nominal wage changes (wage freezes). The consequences of the pent-up wage deflation may decisively influence the future development of the Portuguese labour market.

Introduction

The Portuguese labour market has recently been confronted by very severe economic shocks that translated into a dramatic destruction of jobs and into historically high levels of unemployment, thus revealing a weak resilience. The adjustment of the labour demand was exploited in the study of Carneiro, Portugal and Varejão (2014). In this article, we will focus on wage developments, looking in particular to the reaction of nominal and real wages to breaks in economic activity, comparing the wages of newly hired workers with the wages of job stayers.

The bulk of the empirical research that has analysed the behaviour of wages based on microeconomic data has been focused predominantly on ongoing labour relations. In contrast, the rigidity of wages of newly hired workers has received much less attention in the literature.³ This occurs despite the recognized importance of wages of this particular labour force group for job creation and to understand the behaviour of wages over the business cycle (see Pissarides, 2009): the newly hired workers are the workers in the adjustment margin that decisively affect firms' hiring decisions.

An important branch of this research distinguishes the wages of newly hired workers from the wages of job stayers analysing their different behaviour over the business cycle. These studies show that the wages of the newly hired workers are considerably more sensitive to the economic cycle. However, since the number of workers in ongoing jobs is higher than the number of new hires, the aggregate wage becomes invariably more rigid.

These studies have highlighted the idea that the wage response to aggregate labour conditions differs considerably between workers in ongoing jobs and the newly hired workers. Vroman (1977) shows that the patterns of real wage increases for job stayers and job changers are broadly consistent with the theory of the Philips curve formulated by Robert Hall.⁴ Devereux and Hart (2006) and Barlevy (2001) study the wages of job changers and both conclude that their wages are much more sensitive to the cyclical swings than the wages of incumbent workers. Pissarides (2009) provides a survey of these and other empirical micro labour studies and finds that the wages of job changers respond much stronger to unemployment than the wages of workers in ongoing jobs. Carneiro *et al.* (2012) use matched employer-employee data for Portugal in the period from 1986 to 2005 and find that, after controlling for both firm and worker heterogeneity, entry wages are much more procyclical than wages of job stayers.⁵

The main objective of this study is to update the analysis of the cyclical behaviour of entry wages and assess the extent to which firms' internal factors are important for determining the wages of newly hired workers. In particular, we analyse the relative importance of internal and external factors

(such as the wages of workers with similar qualifications and experience or the availability of workers with similar characteristics on the market) for determining entry wages. *Bils et al.* (2014) present evidence that supports the notion that entry wages are partly determined by the wages of stayers. As Blanchard and Summers (1987) point out, if wages are essentially determined by internal factors (such as the internal pay scale or the wages of workers who are in the same job title), this may generate hysteresis in the economy, so that the impact of economic shocks can last longer.

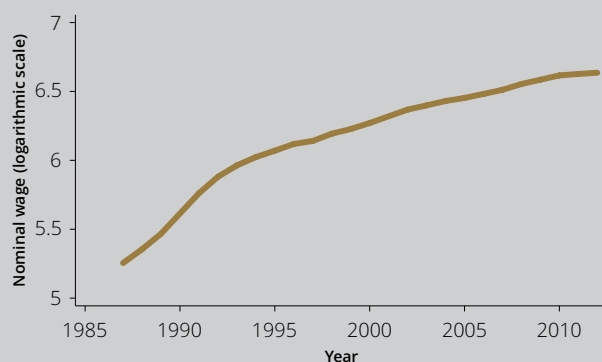
In this context, the relevant theoretical framework of this article is tributary of the well-known insider-outsider theory. This theory emphasizes the idea that established workers (insiders) have most often better employment opportunities than the outsiders. One reason for this to happen is the costs that firms have to bear when they replace insiders by outsiders. These costs include, for example, those related to hiring, firing or training new employees (see Lindbeck and Snower, 2001, Cahuc and Zylberberg, 2004, and Teulings and Hartog, 2008). The specific character of insiders' qualifications and the presence of hiring and firing costs give a comparative advantage to insiders that they can explore to negotiate wages above those that outsiders would be willing to receive, without threatening their job post. The result is that these potential workers may become unemployed involuntarily or have their professional possibilities limited to less desirable jobs.

A number of studies has confronted the insider-outsider theory and the empirical evidence. One of these lines of research has tested the extent to which wages are affected by firms' internal conditions and not only by external conditions (Holmlund, 1991 and Lever 1995 present good summaries of the first studies in this area). Generally, empirical tests are consistent with the hypothesis that both the internal factors and the external factors affect the wages of newly hired workers.

Recent developments in nominal and real wages aggregates

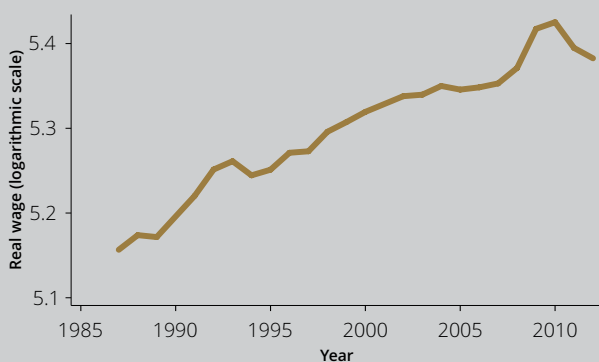
Computing wage aggregates based on the information of the individual records from the *Quadros de Pessoal*, we can see in Charts 1 and 2 that in the latest period nominal wages have maintained a weak growth trajectory (grew 1.1 per cent in 2011 and 0.9 per cent in 2012), while the aggregate

Chart 1 • Behaviour of nominal wages (1986-2012)



Sources: *Quadros de Pessoal* (1986-2009) and *Relatório Único* (2010-2012).

Chart 2 • Behaviour of real wages (1986-2012)



Sources: *Quadros de Pessoal* (1986-2009) and *Relatório Único* (2010-2012).

real wage has observed a significant drop in the recent economic downturn (-2.9 per cent in 2011 and -1.2 per cent in 2012).⁶

Recent developments in nominal wages reflect a conspicuous increase in the fraction of workers with frozen wages, which in 2012 amounted to nearly four-fifths of workers who remained in the same firm (Charts 3 and 4). In contrast, the fraction of workers who benefited from nominal wage increases declined significantly whereas the proportion of workers whose wages were cut remained at low levels. The latter result is consistent with the institutional framework of wage formation that sets legal (and psychological) barriers to the nominal fall in wages. It is well known that the Portuguese labour market is a remarkable case of nominal wage rigidity (Dickens *et al.*, 2007). It is revealing to note that both the indicator of wage freezes and the indicator of nominal wage increases are significantly influenced by the inflation rate changes and by the unemployment rate. In contrast, the indicator of nominal losses does not seem to respond to changes in the unemployment rate or in the inflation rate (Table 1).

Table 1 • Cyclical sensitivity of nominal wage changes: freezes, cuts and increases
| OLS estimates

	Nominal Wage Freezes	Nominal Wage Cuts	Nominal Wage Increases
Inflation rate change	-1.993 (0.700)	-0.606 (0.700)	0.915 (0.136)
Unemployment rate change	0.119 (0,040)	0.007 (0.014)	-0.007 (0.003)
Number of observations	27,026,518	1,441,018	19,543,112
R ²	0.093	0.003	0.049

Sources: *Quadros do Pessoal* and *Relatório Único* (1986-2012).

Note: Wage freezes are defined as a dummy variable that takes the value 1 for those workers whose nominal wages were frozen. Wage cuts and wage increases are defined on the basis of changes in the total amount of base wages. Robust standard errors in parenthesis.

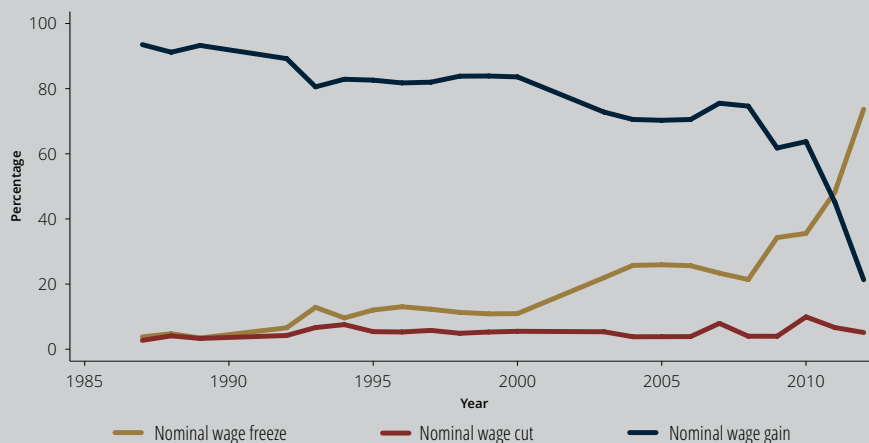


Chart 3 •
Freezes, cuts
and increases
in base wages
(share of workers
covered)

Sources: *Quadros de Pessoal* (1986-2009) and *Relatório Único* (2010-2012).

On the cyclical sensitivity of real wages

The indication of strong nominal wage rigidity could lead us to suspect that this rigidity may contaminate the cyclical sensitivity of real wages. In particular, it is well-known that the adjustment of real wages can be problematic in low inflation and low productivity growth regimes, since it may require nominal wage cuts that are unwanted both by workers and employers.

Empirical research on the cyclical behaviour of real wages in Portugal has shown a strong sensitivity of real wages to the economic cycle, especially in the case of wages of newly hired workers (Martins *et al.*, 2012, Carneiro *et al.*, 2012). These conclusions are reinforced when isolating the changes associated with cyclical compositions of the skill levels of employees, types of jobs and firms' remuneration policies.

Extending the analysis of the cyclical behaviour of real wages up to 2012, thus including the period of the Great Recession, it seems that there was no structural break. That is, the recent behaviour of real wages seems aligned with the indication that an increase of one percentage point in the unemployment rate is associated with a fall of 2.1 per cent for job stayers and 2.4 for new workers (Table 2).

Table 2 • Cyclical sensitivity of real wages

OLS		
	Stayers	New hires
Unemployment Rate	-0.90 (0.29)	-0.22 (0.29)
Number of observations	42,444,841	
R ²	0.101	
Worker fixed effects		
	Stayers	New hires
Unemployment Rate	-2.09 (0.21)	-0.34 (0.04)
Number of observations	42,444,841	
R ²	0.878	
First differences		
	Stayers	New hires
Unemployment Rate	-1.23 (0.44)	-0.71 (0.20)
Number of observations	27,026,518	
R ²	0.014	
High-dimensional fixed effects		
	Stayers	New hires
Unemployment Rate	-2.00 (0.15)	-0.20 (0.03)
Number of observations	42,444,841	
R ²	0.925	

Sources: *Quadros do Pessoal* and *Relatório Único* (1986-2012).

Note: Dependent variable: log of the CPI-deflated base wage. Additional regressors: age, square of age and a quadratic time trend. Robust standard errors corrected by yearly clusters in parenthesis.

The relative importance of internal and external determinants of entry wages

The distinction between internal and external wages has several implications for the definition of entry wages. First, companies can choose not to negotiate entry wages above the floors set by collective bargaining because of relative fairness or other strategic reasons such as competition or human resources management.

Secondly, recent empirical evidence shows that entry wages are at least partially influenced by the wages of stayers (see, for example, Bils *et al.*, 2014). By negotiating wages above the external options of each newly hired worker, firms reduce the rotation of workers, retaining these workers and reducing the number of separations.

Third, since a significant percentage of firms pay wages above the floors defined by the pay scales (typically sectoral), they can benefit from the so-called “wage cushion” (Cardoso and Portugal, 2005) that results from the difference between the wages actually paid and the wages floors for each job title established by collective bargaining. In the face of an adverse demand or cost shock, these firms are in a more comfortable position to make wage adjustments *vis-à-vis* those firms that pay wages close to the minimum values.

Finally, there is convincing empirical evidence that shows that firms’ wage setting policies are clearly heterogeneous. The fact that the heterogeneity in wage policy contributes significantly to the wage change (Torres *et al.*, 2013) is a clear sign that firms in many cases cannot be considered as wage takers. Webber (2013) argues that the labour supply elasticities faced by firms are relatively low, indicating that firms have some monopsony power (Manning, 2003). If, in fact, firms’ monopsony power has an important role this should influence the relative importance of internal and external factors in determining starting wages.

In order to better understand the relative importance of internal and external factors in determining entry wages, we will focus this analysis on the behaviour of newly hired workers. The analysis is also confined to cases in which for each newly hired worker there is at least one worker in the same firm, year and job title with a job tenure higher than 12 months.

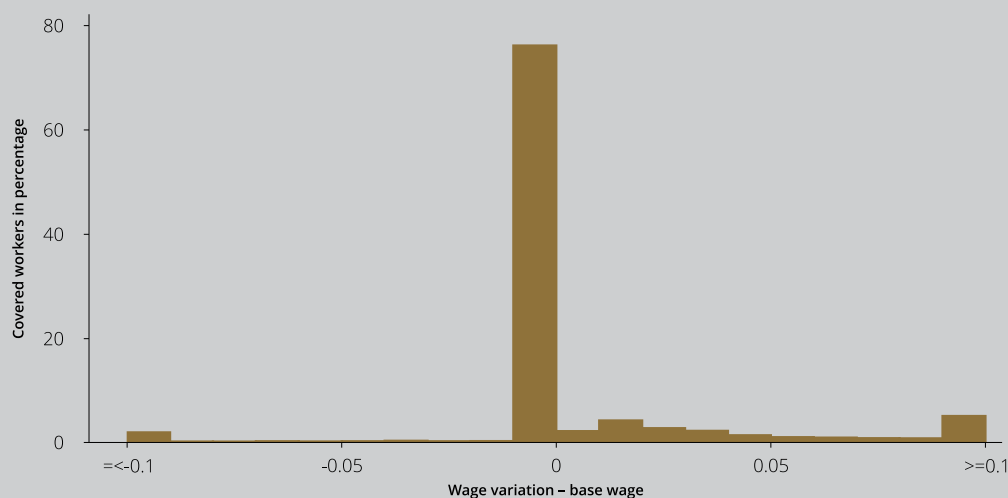


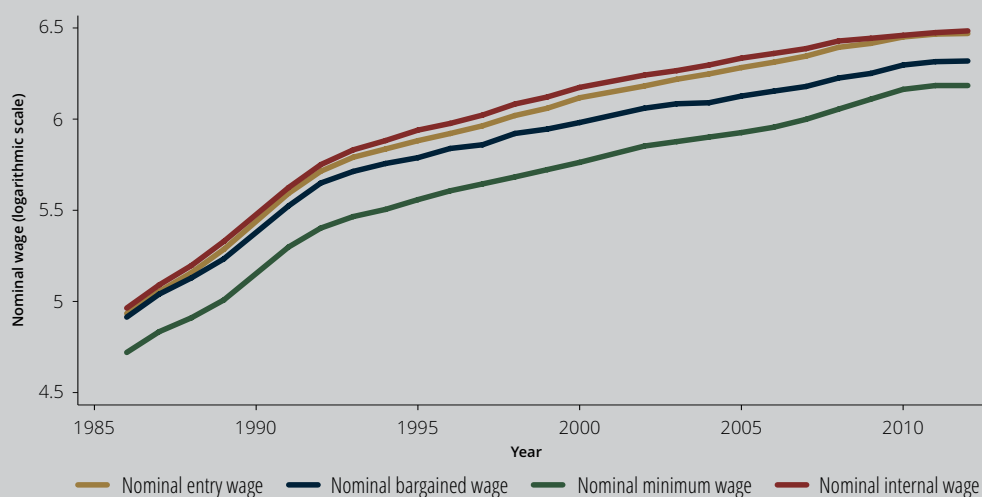
Chart 4 •
Change in base wages in 2012
(share of workers covered)

Sources: *Quadros de Pessoal* (1986-2009) and *Relatório Único* (2010-2012).

In order to separate the internal from the external factors that determine entry wages, for each newly hired worker we calculate an “internal wage” and an “external wage”. The latter is simply the modal wage in each year corresponding to the job title of the newly hired worker defined in the context of collective bargaining, while “internal wage” is the mode of the base wage of all workers with a job tenure higher than 12 months in the same year, firm and job title. Chart 5 shows the behaviour of nominal wages. Interestingly to observe the proximity between the entry and the internal wages and, more generally, the comovement of the four series.

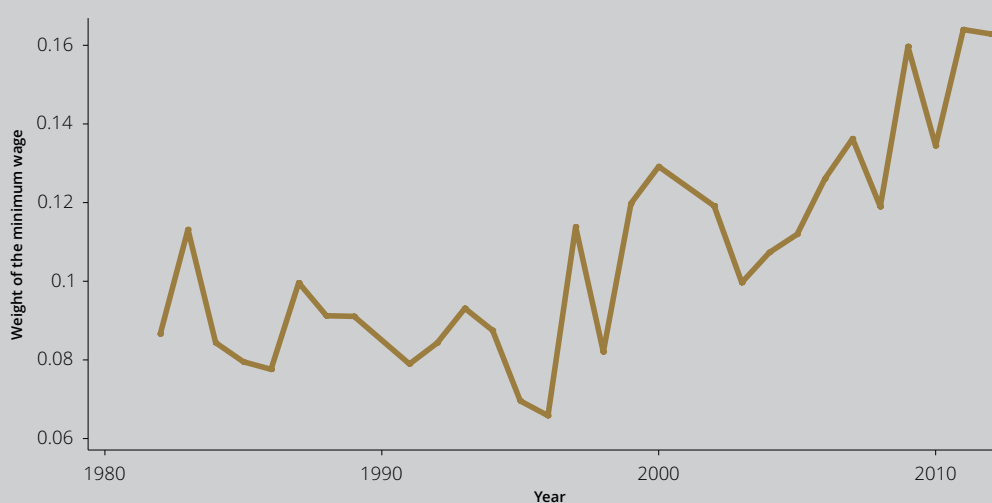
The way we measure the relative importance of the internal and external determinants of entry wages is simple but unconventional. Essentially, what we do is to estimate a regression model where the entry wage is regressed on the internal, the external and the minimum wages.

Chart 5 •
Behaviour of
entry wages
and the three
determinants



Sources: *Quadros de Pessoal* (1986-2009) and *Relatório Único* (2010-2012).

Chart 6 •
Contribution of
minimum wages to
entry wages



Sources: *Quadros de Pessoal* (1982-2009) and *Relatório Único* (2010-2012).

The model coefficients for the three wage variables can be interpreted as measuring the weights assigned by firms to each component in the formation of the entry wage. A question of interest is to evaluate the behaviour of the effect of the minimum wage, the bargained (or market) wage and the internal wage in determining the entry wage. Charts 6, 7 and 8 show that behaviour.

The results show that the internal wage structure of firms is relatively more important for the determination of entry wages: it represents on average about 70 per cent in the determination of entry wages in the period 1982-2012. However, the external and the minimum wages are also important, representing on average, respectively, 21 and 13 per cent of entry wages. More telling is the sharp downward trend of the weight of bargained wages. This development may be associated with the sustained decline of union representation discussed in Portugal and Vilares (2013). On the



Chart 7 •
Contribution
of bargained
wages to entry
wages

Sources: *Quadros de Pessoal* (1982-2009) and *Relatório Único* (2010-2012).

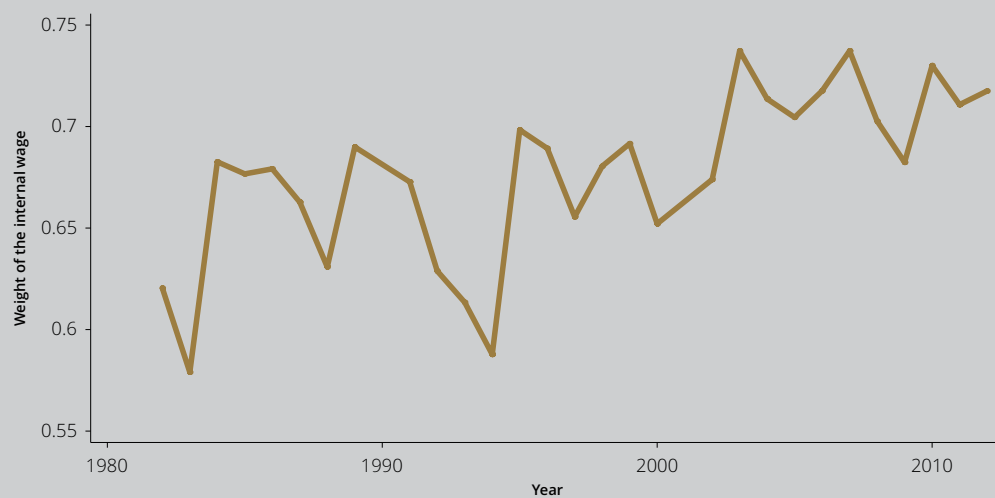


Chart 8 •
Contribution
of internal wages
to entry wages

Sources: *Quadros de Pessoal* (1982-2009) and *Relatório Único* (2010-2012).

other hand, the importance of the minimum wage has increased, especially in recent years, which could mean that the bargained wage increasingly depends on the union power which is guaranteed by the mechanisms of political decision. In general, estimates of the importance of the various components faithfully reflect the presence of workers who are paid according to the minimum wage, the external wage and the internal wage.

Conclusions

The recent behaviour of wages in the Portuguese labour market reflects the consequences of a sharp drop in economic activity and, in this way, the demand for labour. The most remarkable fact of the nominal wage adjustment was the significant increase of zero wage changes. The fact that almost 80 per cent of workers have their wages frozen in 2012 could mean that firms and workers have resisted an adjustment through nominal wage cuts. Workers for obvious reasons. Firms because they realize the devastating effect on the morale of workers triggered by nominal wage cuts. This lack of adjustment, however, may mean that the prospects for future wage increases may be partially compromised by the effect of the so-called “pent-up wage deflation”, an effect that has been pointed out in particular by Janet Yellen (2014).

The Portuguese labour market seems to have maintained up to 2012 a behaviour consistent with a significant cyclical sensitivity of real wages. However, it is not guaranteed that, in a climate of very low inflation rates or even deflation, accompanied by low productivity growth, wages will allow additional accommodation margins. In a scenario with these horizons, rising unemployment, again, may be the leading edge of adjustment.

Wage policies of Portuguese firms are very heterogeneous. These policies are differently affected by the minimum wages, by the wages negotiated through collective bargaining and by the internal rates of remuneration. The indication that minimum wages have had a growing influence on the formation of entry wages should be taken with some concern since this could mean that firms are losing autonomy in their wage setting decisions.

Finally, it should be emphasized that the debate on wage adjustment in Portugal has not valued enough the labour costs adjustments that can be made through movements that are not exhausted in of nominal wage cuts. In an environment of low inflation, in particular, it would be important to consider reductions in payroll taxes (reductions in the single social security tax or fiscal credits for earned income) directed mainly to workers with low qualifications.

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Notes

1. The opinions expressed in this article are those of the authors and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.
2. Banco de Portugal, Economics and Research Department.
3. Rigidity in this context refers to the absence of deviations between wages of new hires and wages of incumbent workers with similar qualifications.
4. According Hall (1974), movements in the aggregate wage rate are dominated by changes in wage rates paid to newly hired workers.
5. An increase of one per centage point in the unemployment rate decreases the entry wage by 2.7 per cent and by 2.2 per cent the wage of job stayers in the same job title.
6. For consistency reasons and to make the presentation clearer, this analysis will be based on base wages of full-time workers included in *Quadros de Pessoal*. Base wages account for 80 per cent of total wages.