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HIGHLIGHTS IN THIS ISSUE:

Wage adjustment in Spain: slow, inefficient and unfair?

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Summary

- At the aggregate level, average real wages decreased moderately in Spain between 2010 and 2013
- However, the reduction in average remunerations was higher, and it was partly offset by significant composition effects
- The wage reduction for temporary workers started already in 2009 and was quantitatively much larger than the adjustment observed amongst employees with open-ended contracts

Our analysis of microeconomic data between 2008 and 2013 suggests that the wage adjustment process in Spain, which began in earnest only in 2010, has been slow and inefficient and has hit temporary workers disproportionately hard.

Whereas total employment fell by more than 16%, real aggregate wages in Spain fell by about 4.5% over the period 2008-2013. However, this aggregate figure masks a greater underlying reduction in individual wages, which occurred at the same time as changes in the composition of the employed population: as massive labour shedding was taking place, more tenured, more educated, and more qualified workers tended to be relatively less affected.

Our analysis also looks into the implications for this adjustment of the high degree of segmentation of the Spanish labour market between workers with open-ended contracts and those with temporary ones. It emerges that temporary workers were both more likely to lose their jobs and more likely to suffer larger wage cuts.

The data also indicate that the selection bias was even stronger for temporary workers: the average quality of the temporary labour force appears to have improved more than the average quality of employees with open-ended contracts. This could be partly explained by different productive needs among firms that primarily employ workers on open-ended contracts, but it is also consistent with possible distortionary effects of the relatively higher degree of employment protection afforded to employees with open-ended contracts under Spanish legislation. Because companies' decisions about lay-offs are affected by dismissal costs, it is possible that factors unrelated to performance, such as tenure, may have influenced companies' decisions on which of their employees with open-ended contract they should dismiss.

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The expansionary cycle before the bursting of the housing bubble added 7 million jobs

In the wake of crisis, the net outflow of workers was in the order of 4 million

Introduction

The period between the second half of the 1990s and 2007 was characterised by an unprecedented surge in employment. Strong economic growth was accompanied by a surge in employment of about 7 million. Despite this positive performance, the Spanish labour market remained highly dysfunctional: wage and productivity dynamics diverged markedly, eroding the competiveness of the Spanish economy; structural unemployment persisted at a high level; and almost a third of the employees were employed under short-term contracts.

The outbreak of the crisis in the context of a dual and rigid labour market and large sectoral shifts related to the sharp downsizing of the construction sector and – to a lesser extent – the financial sector triggered a dramatic increase in unemployment. The massive labour shedding hit first and foremost temporary workers. Between 2008 and 2013, almost 3.5 million jobs were destroyed. As unemployment rose from less than 10% to over 25% and the share of temporary workers dropped from 29% to 23% (Graph 1). But, as the crisis deepened, dismissals occurred more and more also amongst the relatively well-protected workers employed under permanent contracts.

Graph 1: Evolution of fixed-term and open-ended contracts and unemployment rate



Graph 2: Average wages by type of contract



Source: INE, own calculations

Source: INE, own calculations

Real wages increased only mildly in the expansionary phase and have accordingly decreased moderately during the recession. In particular, real wages appear to have contracted by about 4.4 pps between 2008 and 2013 – according to the Households' Budget Survey (Graph 2) and about 3.2 pps according to the national accounts. The reduction has been sharper since 2010, since real wage still increased in 2009, despite the negative stage of the economic cycle.¹

The empirical literature has highlighted the role of composition effects in explaining the sticky behaviour of wages. The observed change in the average wage is the result of changes in the characteristics of the employees and their employment (i.e. a composition effect) and changes in the remuneration of these characteristics (i.e. a price or returns effect). In a labour market characterised by high inflows and outflows, aggregate wage behaviour may be significantly affected by changes in the composition of characteristics of employees and structure of employment.

Carrasco et al. (2011) relate the subdued growth of real wages in the period before the crisis to structural changes, such as the rise in the weight of employment in the construction and services sectors, the increase in female employment participation,

Average wages appear to have reacted slowly to these sharp fluctuations in the labour market

Changes in the labour force composition might partially obfuscate changes in the structure of remunerations

Issue 10|November 2014

The extent and nature of wage adjustment are likely to differ between employees with open-ended contracts and employees with fixedterm contracts

Changes in average wages can be decomposed in changes in the structure of returns on characteristics of the labour force and changes in the composition of the labour force

The framework can be expanded to take into account the duality of the labour market and the arrival of large immigration inflows. Likewise, according to Puente and Galán (2014), in the prolonged recession which started in 2008, job destruction concentrated in sectors employing lower skilled and less experienced workers whose average wage was below the overall average (i.e. mostly – but not exclusively – in the construction sector). This selective labour shedding process partially obfuscated the extent of the adjustment of the remuneration structure.

Beyond structural elements, wage setting institutions also contributed to a slow adjustment that operated mainly through quantities rather than through prices. Before the 2012 labour reform, Spain's collective bargaining system featured an intermediate degree of centralization (at the sectoral and regional levels), which did not allow for a sufficient adaptation either to the macroeconomic conditions or to the microeconomic conditions of the company.² This favoured principally employees hired under open-ended contracts, who also benefited from relatively generous employment protection legislation (EPL). On the other hand, the high turn-over of temporary workers is likely to have contributed to a more significant adjustment of returns on employee characteristics at the moment of renewal of contracts, while the short duration of contracts allows for an almost costless dismissal at the time of the expiry of the contract. Graph 2 clearly shows that the reduction in the average wage of employees with fixed-term contract started before that of employees with open-ended contracts and was considerably larger than for employees with an open-ended contract (about 20% and 5%, respectively over the period between 2008 and 2013).

We assess how the cost of the observed wage adjustment was shared amongst employees hired under open-ended and fixed-term contracts. We propose a technique which allows us to decompose the observed change into price and composition effects for both classes of employees.

Estimating framework

The decomposition technique popularised by Blinder (1973) and Oaxaca (1973) is widely used to study mean outcome differences between groups. The technique has often used to analyse wage gaps by sex or race, or to analyse changes in average wage over time. In the Spanish labour market, it has also been applied to estimate wage discrimination associated with temporary contracts (see for example Davia and Hernanz, 2004).

Let us assume that the logarithm of the wage of an employee *i* in periods *t* and *s* can be modelled as a linear combination of observable characteristics *x*, weighted by a vector of coefficients β and an error term ϵ :

$$w_{ir} = \beta_r(x_{ir}) + \epsilon_{ir}$$
, $r = t, s$

Denoting $\hat{\beta}_r$ the vector of coefficients estimated by Ordinary Least Squares (OLS), \overline{w}_r the average wage and \overline{x}_r the vector of average characteristics (with r=t, s), the following decomposition will always hold by construction:³

$$\overline{w}_t - \overline{w}_s = \underbrace{\hat{\beta}_t(\overline{x}_t - \overline{x}_s)}_{(1)} + \underbrace{\overline{x}_s(\hat{\beta}_t - \hat{\beta}_s)}_{(2)}$$

where the summands (1) and (2) can be interpreted respectively as the change in the characteristics of the employed population and the change in the estimated returns on these characteristics between period t and s.

Let us extend the above framework to take into account the duality of the labour market. It is possible to decompose the aggregate change in real wage as the sum of: composition effects in the sub-sample of (1) employees with an open-ended contract and (2) employees with a fixed-term contract; the price effects for employees with

(3) an open-ended contract and (4) a fixed-term contract; and (5) the change in the share of temporary workers:

$$\overline{w}_{t} - \overline{w}_{s} = \underbrace{\underbrace{\theta_{t}^{F} \widehat{\beta}_{t}^{F} (\overline{x}_{t}^{F} - \overline{x}_{s}^{F})}_{(1)}}_{(1)} + \underbrace{\underbrace{\theta_{t}^{O} \widehat{\beta}_{t}^{O} (\overline{x}_{t}^{O} - x_{s}^{O})}_{(2)}}_{(2)} + \underbrace{\underbrace{\theta_{t}^{F} \overline{x}_{t}^{F} (\widehat{\beta}_{s}^{F} - \widehat{\beta}_{t}^{F})}_{(3)}}_{(4)} + \underbrace{\underbrace{\theta_{t}^{O} \overline{x}_{t}^{O} (\widehat{\beta}_{s}^{O} - \widehat{\beta}_{t}^{O})}_{(5)}}_{(5)} + \underbrace{\underbrace{\theta_{t}^{O} \overline{x}_{t}^{O} (\theta_{s}^{O} - \theta_{s}^{O})}_{(5)}}_{(5)}$$

where the subscripts F and O, indicate fixed-term and open-ended contract and θ^{F} and θ^{O} are the share of employees hired under fixed and open-ended contracts.⁴

The results of the decomposition are clearly affected by the choice of the variables in the wage equation. One could opt for a relatively compact Mincer wage equation, relating earnings to the product of human capital endowments such as education and experience (Mincer, 1974). In this case the observed characteristics would only include schooling and professional experience. Alternatively, one could opt for a richer specification that also takes into accounts characteristics of employment or of the characteristics of the local labour market. In the first case, the price and the composition effect focuses on subjective characteristics of the labour force. In the latter case, it focuses on subjective and objective characteristics of the labour force – and also captures structural changes in the economy and not just in the labour force. In typical applications of the Oaxaca-Blinder decomposition, the choice of the explanatory variables is of core relevance, since the analysis is often normative in nature and aims at assessing justifiable and non-justifiable (i.e. discriminatory) differences in wages. In this context, the difference in the constant (interpretable as a return rate on non-observable characteristics, or a wage-drift component) is sometimes isolated in the decomposition.

We follow a positive approach and aim at assessing the extent to which the difference in the real wages can be attributed to changes in broadly defined observable characteristics of the employed population and changes in the rates of return on these observable and non-observable characteristics (i.e. without isolating the change in the constant). The preferred specification therefore includes characteristics of the employee (age, age squared, educational dummies, gender and nationality) and characteristics of employment (occupation, sector, industry and region).⁵ Incidentally, this also allows us to control for significant sector specific shocks (i.e. the sharp downsizing of the low-skill intensive construction sector) that would otherwise bias the results. We do not expect the decomposition to be strongly dependent on the selection of the characteristics in the wage equation, since the changes in the rate of return of observable characteristics and non-observable characteristics tend to offset each other as the vector of regressors is extended or restricted. To test the robustness of results, both the standard and the extended decompositions are also estimated with a more compact Mincer equation.

The data

The Structure of Earnings Survey (SES) is in principle the most appropriate survey to assess changes in the wage structure.⁶ The major shortcoming is that it is conducted every four years. The Spanish National Institute of Statistics (INE) conducted the last available survey in 2010 and the next survey is being conducted in 2014. This makes the SES unsuitable for monitoring short-term developments of wages. Finally, the SES also risks being biased: it surveys only companies working in industry, services and construction. Furthermore, there is a risk that informal employment is not systematically covered.⁷

In order to overcome these limitations, we rely on the Household Budget Survey

In quantifying the wage adjustment, we consider subjective characteristics (related to the worker) and objective characteristics (related to employment)

In order to monitor recent developments, we rely on information on earnings from the Households' Budget Survey (HBS). The survey is conducted on a yearly basis with the primary aim of collecting information on expenditures of households. The sampling unit is the household and information on expenditure is collected at both individual and household levels. In order to check the consistency of information supplied, the survey also collects information on revenues. Finally, the survey collects a limited set of information on the working conditions of the principal earner and his/her net monthly income.

The fact that information is only gathered for principal earners is, however, problematic – as this tends to under-represents the number of youngsters, women and temporary workers. In order to overcome this representativeness bias, we reweight the sample, by correcting the original weights using a weights structure derived from the Labour Force Survey and based on the following categories: sex, age, and type of contract. Since we focus on the population of employees, we approximate regular income by labour earnings. Revenue from capital is in fact typically recorded at household level, while employees typically receive no (or negligible amounts of) social transfers.

Table 1: Employees: Descriptive statistics (HBS and LFS weights)

	HBS weights		LFS weights	
	2008	2013	2008	2013
Real gross wage				
All employes	21,627	20,541	21,867	20,901
Fixed term contract	13,777	12,376	14,212	12,201
Open ended contract	22,146	23,231	22,831	23,359
Type of Contract				
Fixed term	24%	25%	29%	22%
Open ended	76%	75%	71%	78%
Gender				
Male	74%	68%	55%	51%
Female	26%	32%	45%	49%
Nationality				
Spanish	88%	88%	81%	84%
Non Spanish	12%	12%	19%	16%
Education				
Illiterate	2%	2%	1%	0%
Did not finish compulsory education	25%	14%	15%	6%
Secondary education (first level)	27%	32%	28%	29%
Secondary education (second level)	11%	13%	14%	15%
Technical education (first level)	6%	6%	8%	8%
Technical education (second level)	7%	9%	9%	11%
Tertiary education	8%	9%	9%	12%
Post university education	12%	14%	15%	18%
Age	50	52	40	43
Obs	16140	16605	16140	16605

Source: INE, own calculations

Table 1 presents the descriptive statistics for the estimation sub-sample before and after re-weighting. Applying LFS weights, we obtain a sample that is on average younger, more educated and contains a larger share of female employees. It is interesting to note that with both weights, the labour shedding that occurred between 2008 and 2013 led to significant changes in the composition of the labour force: more tenured and better educated, but also characterised by a higher share of females and a lower share of foreign employees. The most striking change, however, is the change in the share of temporary workers: whereas the share of temporary workers was relatively stable amongst primary earners, re-weighting using the LFS increases considerably the weight of temporary workers in 2008 and reduces it in 2013. The gross real wages were reconstructed by applying grossing-up factors defined for broad brackets of net wage, using information on the tax structure gathered by OECD (OECD, 2008 and OECD, 2013), and by deflating the result with the private consumption deflator.⁸

Estimation results

We estimate the standard and the duality-augmented decomposition with a compact Mincer equation (model I and III respectively) and with a wage equation that also controls for characteristics of the employment (model II and IV respectively).⁹ The

We adjust the more recent Households' Budget Survey data in order to obtain gross wages for a representative sample of the working population We find evidence of a significant adjustment in the structure of returns, partially offset by a productivity enhancing labour shedding process results of the decomposition are summarised in Graph 3, where the total change in real wage has been normalised to -100.¹⁰ Looking at the standard decomposition, it is clear that the specification of the wage equation plays a relatively minor role, although clearly the inclusion of sectors and industries tends to reduce the magnitude of the offsetting composition and price effects. Yet, the adjustment in returns is in both cases more than twice the total reduction in real wage, since it is partially offset by composition effects. These results are in line with evidence provided by Puente and Galán (2014), who – based on an analysis of administrative data – provide evidence that net of composition effects, real wages would have decreased by twice as much in 2011 and 2012.



Source: INE, own calculations

Source: INE, own calculations

The other two bars in Graph 3 summarise the results of the extended decomposition. Here we take full account of the dual nature of the labour market and estimate separate wage equations for the two sub-groups and the two periods. Here too, the specification of the wage equation does not qualitatively impact on the results. Furthermore, we find evidence of strong adjustments in the wage structure, partially offset by composition effects in both groups. In particular, the aggregate change in the rate of remuneration of productive characteristics – i.e. the price effect – is about twice the size of the change in the average wage.

The most striking difference is the reduction of the impact of the composition effect, which is about half of that found in the previous decomposition. This augmented decomposition clarifies that a share of the adjustment captured in the previous decomposition, actually corresponds to an increase in the wage penalty associated with temporary work. More importantly, around half of what was previously qualified as a composition effect is actually due to selective labour shedding of workers with fixed-term contracts. This later specific effect is captured in the second decomposition in the component "change of duality", which reflects the lower weight of temporary workers between 2008 and 2013.

There is another aspect of the adjustment that is not fully captured by Graph 3, in which the composition and the price effects for each category of employees are weighted – for aggregation purposes – by the relative weight they have in the labour market. Looking at the un-weighted price adjustments in model III and IV, as in

A significant share of dismissals were related to the nature of the contract – rather than to the characteristics of the workforce

The adjustment in the remuneration structure appears to have been much sharper amongst temporary workers Composition effects were also much stronger amongst temporary workers, signalling a more selective labour shedding process

There is evidence that the dual labour market has made the wage adjustment not only slower but less efficient

Moreover adjustment costs disproportionally penalised temporary workers

These results call for a critical revision of the current dual setting in the Spanish labour market Graph 4, the price adjustment appears to be three to four times as large and the offsetting composition effect twice as large for employees with fixed-term contracts than for employees with open-ended contracts. In other words, temporary workers appear to have been penalised twice: not only did labour shedding affect temporary workers disproportionally, but their wages suffered from a sharper adjustment of returns. This is not surprising considering the size of the outflows and the possibility of re-negotiating wages at the end of each contract. In addition, it appears that the dismissal of temporary workers has been more selective than for employees with an open-ended contract: composition effects were significantly stronger for temporary workers. This effect may be explained by different needs of sectors employing prevalently under open-ended or fixed-term contracts. However it is clear that in the case of dismissal of employees with open-ended contracts, the costs of dismissal constitute an important variable in employers' labour shedding strategies. It is therefore possible that relatively stricter EPL has partially distorted the dismissal strategy of firms employing employees under open-ended contracts and limited their capacity to conduct a more selective dismissal based on the productive

Conclusion

characteristics of their employees.

We provide broad evidence that, net of composition effects, the changes in the real wage would have been almost twice the reduction in the real average wage during the period 2008 to 2013. We further show that the size of the adjustment in returns was about three times larger for employees with fixed-term contracts than for employees with open-ended contracts. This is hardly surprising considering the possibility of renegotiating wages at the expiry of fixed-term contracts. It also suggests that temporary workers have been penalised twice: being exposed to a higher risk of dismissal and subject to a sharper adjustment in returns.

Finally, we note that the improvement in the average characteristics of the labour force was about twice as important for temporary workers than for employees with open-ended contracts. This may be related to specific needs of firms employing prevalently employees with open-ended or fixed-term contracts. It is however likely that dismissal strategies were partially distorted by the relatively higher degree of employment protection afforded to employees with open-ended contracts under Spanish legislation. Because companies' decisions about lay-offs are affected by dismissal costs, it is possible that factors unrelated to performance, such as tenure, may have influenced companies' decisions on which of their employees with open-ended contract they should dismiss. On the other hand, amongst temporary workers, the economic rationale prevailed and employers were able to retain the most productive labour force.

All in all, these results support evidence that high duality in the labour market can lead to a slow and inefficient adjustment process, which disproportionately penalises temporary workers. These results call for a reform of the labour market legislation that reduces the ELP gap between employees with open-ended and fixed-term contracts and facilitates responsiveness of wages also amongst employees with open-ended contracts.

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$$w_t - w_s =$$

= $\theta_t^F \overline{w}_t^F + \theta_t^O \overline{w}_t^O - \theta_s^F \overline{w}_s^F - \theta_s^O \overline{w}_s^O$

and apply the previous decomposition to each subgroup.

⁵ We do not suggest that gender is a determinant of human capital. However, in Spain – just like any other country – women tend to be discriminated against on the basis of ex-ante expectation of reduced availability – owing to social norms for care responsibilities. In the same vein, the inclusion of nationality reflects employers' expectations that foreigners' experience acquired in a different context is less valuable.

¹National accounts also show that the contraction in aggregate wages only started in 2010.

² This rigid system was exacerbated by the so-called ultra-activity, i.e. the indefinite prolongation of the expired terms of contract in the absence of new contractual agreements. The latter applied de facto only to open-ended contracts, since temporary contracts were terminated on their natural expiry and, in case of re-employment, new terms could be negotiated. In addition, the conditions for opting out of the collective agreements were too strict and rendered its use very difficult. Thus, the bargaining structure largely prevented wages from being configured as an additional adjustment element, while also hindering their role as an incentive mechanism.

³ By construction, in OLS estimations, the expected value of the error terms is zero.

⁴ The decomposition follows from standard disaggregation techniques used in shift-share analysis, augmented by the Oaxaca-Blinder decomposition for between groups differences. We decompose the average in the weighted averages of wages in open-ended and fixed-term contracts:

⁶ These surveys typically use firms as a sampling unit and are able to get accurate information on gross wages and their components – including nonmonetary benefits.

⁷ For the purpose of the analysis, we consider employees that declare work without a contract (about 2.5% of the sample of employees) as temporary workers. Other surveys, like the European Union Survey of Income and Living Conditions (EU-SILC) or the Survey of Households' Finances (EFF) by the Bank of Spain, were also considered. These surveys can and have been used extensively for analysing changes in wage structure/dynamics. Guner et al. (2014), for example, use the EU-SILC to assess the gender pay gap, while a large number of studies rely on the EU-SILC for cross-country comparisons of gender, part-time and migrant workers pay gap. The drawback of the Spanish module of the EU-SILC is the recent switch in the methodology for imputing wages: since the EUSILC 2013 (for 2012 incomes), earnings and other income variables are imputed using administrative data, thus reducing comparability with previous results. As per the EFF, the frequency of the survey also makes it unsuitable for monitor short-term dynamics. An alternative data to decompose the impact of composition effect and changes in the returns on workers characteristics. The issue with using the administrative database is that it excludes informal employment. Furthermore, administrative databases typically have limited information on the personal characteristics of the employees.

[°] In order to validate the procedure, the average gross nominal wage obtained by grossing up re-weighted HBS data was compared with the gross wage obtained from the SES in 2010. The grossing up provided a reasonably good approximation of earnings all in all 22,790 EUR according to the grossed-up HBS wage as opposed to 22,460 derived from the SES. The discrepancy in the average wage of temporary workers however was more substantial (possibly due to the aforementioned coverage issues).

⁹ Note that the wage equations in model I and II also include a dummy for fixed-term contract, which clearly cannot be included in wage equations III and IV since the equations are regressed separately for the two sub-groups. In the first equation, the dummy can be considered as a shift variable that accounts for a reduced rate of human capital development on the job. This is consistent with available information showing significantly lower investments in training and skill developments in employees with fixed-term contracts. In the second equation, it can be interpreted not as a subjective characteristic, but rather as a characteristic of the employment conditions.

¹⁰ We do not present the results of the wage equations. Coefficients have the expected signs and almost all are highly significant. The fit of the model is also relatively good (considering the data shortcomings) and within the range found in the literature. When extended wage equations are estimated jointly for employees with open-ended and fixed-term contracts the R^2 is in the range of .43 for both sub-periods, i.e. well within the range in the literature. The R^2 decreases to a range of .3 to .4 when equations are estimated for the two sub-groups – with the fit being lower for temporary workers. This result is also typically found in the literature, since the wage equations now only explain intra-group and not inter-group differences. The fit of the more compact Mincer equation is, as expected, less strong.