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Roberto Bande
IDEGA-Universidade de Santiago de Compostela

Marika Karanassou
Queen Mary Universtity of London and IZA

Héctor Sala
Universitat Autònoma de Barcelona and IZA

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**EMPLOYMENT IN SPANISH REGIONS: COST
CONTROL OR GROWTH-ENHANCING POLICIES?**

Employment in Spanish regions:
Cost control or growth-enhancing policies?[*]

Roberto Bande[†]

GAME-IDEGA, Universidade de Santiago

de Compostela

Marika Karanassou

Queen Mary Universtity of London[‡]

and IZA

Hector Sala[§]

Universitat Autònoma de Barcelona and IZA

Abstract

After the Great Financial Crisis, regional disparities in Spanish unemployment remain. Since generic labour market reforms have been fruitless on their attenuation, we explore whether Spanish regions react differently to key drivers of employment and wage setting. We find that low income regions are more reactive to a growth strategy based on estimulating investment, while the high income ones are more sensitive to a strategy that keeps unit labour costs low. Our results call for more region-specific policies and discard standard labour market reforms as a unique tool to manage the unemployment rate problem.

JEL Classifications: R11, E24, E22, J23, J31.
Keywords: Employment, Wage setting, Labour income share, Capital stock.

1 Introduction

Once the Great Financial Crisis (GFC) has been reversed, and most developed economies have resumed their long run growth paths, a new debate is open on both academic and political grounds: Is the recovery a natural consequence of the structural reforms undertaken by most countries, or is it just that economic forces that caused the recession are now pushing in the opposite direction? This discussion is especially relevant for the labour market, since many economies have focused their policies in generic labour market reforms, with the declared aim of fostering competitiveness. An intense process of deregulation of the labour market has thus taken place, especially in those economies where the external position before the GFC was more exposed (Bertola, 2017). Unemployment rates are simultaneously falling and employment is recovering. In this context, it is relevant to enquire whether this is a consequence of the undertaken reforms, or whether it would have happened to a large extent in any case, independently of such reforms.

The Spanish labour market represents an interesting case study. Since the onset of the GFC unemployment soared to 26.1% in 2013, the second highest, after Greece, among the OECD countries. In turn, the recovery has been characterised by the low quality of the new jobs, with massive use of non-regular contracts and lower-than-before starting wages. This is largely the consequence of the austerity and internal devaluation policies followed to achieve the external adjustment. These policies, in particular the labour market reforms, are common across regions (and to some extent even across countries) notwithstanding the fact that the labour market situation of such regions may be structurally different.[1] Furthermore, regional heterogeneities coexist with an extreme volatility of the aggregate unemployment rate, with acute convergence and divergence processes with respect to the European average across business cycle phases. Indeed, the jobless rate quickly converged to the EU average during the 'wild ride', evolving from 24% in 1994 to 8.2% in 2007, and diverged subsequently to reach 26.1% in 2013. These aggregate dynamics, however, did not modify the relative ranking of Spanish regions in unemployment terms. It seems natural, therefore, to ask if policies alternative to labour market reforms could be envisaged, and to what extent such policies would differ in their outcomes with respect to the implemented ones.

In this paper, we empirically assess whether Spanish regions react differently to key labour demand and wage setting determinants, and therefore evaluate the potential effect of the recent labour market reforms on the dynamics of spatial unemployment imbalances. We build on previous evidence as regards the existence of groups of regions with distinct labour market performance (e.g., Bande et al., 2008, Bande and Karanassou, 2009, 2014 or Triv\'in and Sala, 2016), and analyse whether labour demand and wage setting in two

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[1]These structural differences are the root of persistent unemployment disparities, which have been documented elsewhere (see for instance Bande and Karanassou, 2009, 2014).

broad groups of Spanish regions are driven by similar forces.[2] The finding of discrepant reactions to changes in labour demand and wage setting determinants would then call for region-specific policies that should be regarded as complementary to the generic labour market reforms.

Standard theoretical models show that wages (as the price of labour), capital stock, and some measure of efficiency appear as key determinants of labour demand decisions. Here we consider labour productivity as a relavant observable measure of efficiency, and focus on the role exerted by the labour share as a determinant of regional employment.[3] This represents an interesting contribution for two reasons. First, there is a growing literature on the causes of the fall of the labour share since the 1980's (see, for example, Karabarbounis and Neiman, 2014), but not much on its consequences. Second, in focusing on the labour share we are actually analysing the effects of changes in the wage-productivity gap. This implies that we can check the relative incidence on regional employment of (i) decreases in the labour share associated to internal devaluation policies, versus (ii) the enlargement of the capital stock – which can be associated to the alternative focus on growth policies. Our analysis can yield insights into the effects of some specific regional action connected to these two policy strategies.

Aside from studying the determinants of employment per group of regions, we also search for wage setting regional specificities. In a standard neoclassical framework, a one-to-one relationship between wages and productivity is to be expected (see, for instance, Hatton, 2007). This implies a constant wage-productivity gap in the long run (or, equivalently, a constant labour share). If this holds, employment swings cannot be dependent on such constant. However, if this unitary long run elasticity does not hold, there is room to examine the potential impact of the changing labour share on employment. It thus becomes crucial to asses this long run elasticity and check whether significant differences exist across regions.

Our empirical models uncover substantial regional differences in the determinants of employment. In addition, the estimation of wage setting equations reveal that the one-to-one long run wage-productivity link is not supported by the data, paving the way for a significant impact of the labour share on regional employment. We verify that this impact is different across regions and use our estimates to perform counterfactual simulations in which we explore how much of the variation in employment in each group

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[2]Specifically, we exploit the contrast in regional economic performance to cluster the 17 Spanish regions in two well-defined groups, based on the classification of Objective 1 Regions of the EU. These are regions that have been targeted by regional policy to promote the development and structural adjustment because their development is lagging behind. We thus classify Spanish regions into a Low Income group (the objective 1 regions) and a High Income group, and conduct our analysis accordingly.

[3]The labour share is the total compensation received by the labour factor over output (Y). Given that total compensation can also be seen as the average compensation per employee (W) times the number of employees (N), we have: $\frac{WN}{Y} = \frac{W}{Y/N}$. Empirically, we will use logs and deal with $w_t - pr_t$, where $pr_t = y_t - n_t$ (lowercase letters denote natural logs of the corresponding capital letters).

of regions can be attributed to changes in the labour share, and how much to changes in capital stock, which is the other crucial determinant. Our results verify the existence of a dual employment pattern: while the more developed regions respond to labour share and investment innovations, employment in the more lagging regions is mainly led by investment.[4] Given that changes in the labour share may be naturally connected to labour market deregulation processes, we reach the conclusion that this strategy is likely to show asymmetric regional outcomes in terms of employment creation, which do not necessarily favour the more lagging regions.

We also explore the role of productivity on wage setting, and how the dynamic interaction of these two variables shapes the evolution of the labour share and employment. In this way we find significant diverging labour share and employment trajectories in both groups of regions for different productivity growth scenarios.

The results from the counterfactual analysis can be used to provide some economic policy advice.[5] If high income regions are more sensitive to changes in unit labour costs, standard policies aiming at enhancing wage flexibility will have a larger incidence there than in the low income regions. Hence, a side effect in periods, such as the current one, in which this type of policies dominate in a context of low investment rates, will be a reinforced persistence of regional unemployment disparities. Complementary measures aiming at fostering investment in the low income group should also be implemented so that these regions are given the chance to catch up in terms of labour market performance. Therefore, regionally-targeted soft credit lines and region-specific capital taxes could be helpful in breaking regional sluggishness. It is not through cost control measures that regions seem to have more chances to catch up in (un)employment terms.

Our simulations show, in addition, that policies focused on the promotion of low productivity activities (which have led economic growth in Spain in the last two decades) are deemed to fail since their effects through wages would be at best employment-neutral in the more developed regions, and would compromise job creation in the low income group. Alternative policies aimed at increasing the link between wage and productivity growth would neither help in alleviating the unemployment problem if productivity growth remains stagnant. It is thus a rather growth-enhancing strategy with a clear region-specific orientation what should guide the design of policy.

The structure of this paper is the following. In Section 2, we revise the theoretical

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[4]This result was already hinted by Bande *et al.* (2008), who argued that wage imitation effects in a context of a semi-decentralised wage bargaining system could result in regional differences in unit labour costs, which were consistent with the evolution of regional unemployment disparities. Note that the concept of labour unit cost is intimately related to that of the wage gap.

[5]We are fully aware that the counterfactual analysis cannot be interpreted as evidence on how would the Spanish regional labour markets *actually* have evolved under the assumptions made (i.e., the chosen counterfactual). However, such analysis is enlightening when trying to account for (and learn on) the major drivers of employment in past significant periods.

background endorsing our empirical modelling. The data, empirical methodology, and estimated models are presented in Section 3. The obtained results are used in Section 4 to conduct dynamic simulations on counterfactual scenarios and learn on the recent experience of the Spanish regions. Section 5 concludes.

2 Theoretical background and estimated models

2.1 Labour demand

The labour demand function can be theoretically modelled departing either from profit maximization or cost minimization; it can be unconstrained (in this case factor prices – wages and the user cost of capital – are the main determinants) or constrained (the constraint may be the capital stock or the level of output, which are kept constant and appear as explanatory variables, respectively); factor prices may be considered in nominal or in real terms; and the product market from which the labour demand is derived may be modelled as in perfect or imperfect competition.[6]

In this context, authors have followed different routes depending on the type of analysis being conducted and existing data limitations.[7] Irrespective of the approach used, the crucial issue underlying the specific modelling of the labour demand is to provide a correct interpretation of the estimated coefficients.[8]

In our case, we work with a capital-constrained labour demand function such that:

$$N_t = f\,(\,W_t\,,\ R_t\,,\ K_t\,,\ PR_t\,),\tag{1}$$

where N denotes employment, W gross average compensation, R real interest rates, K capital stock and PR labour productivity. Other controls, based on data availability, are also included, which basically relate to demand-side and foreign determinants. Among the demand-side variables we include private consumption (over GDP) and factors affecting private consumption (direct and indirect taxes), which affect labour market outcomes through a diversity of channels, such as the price-elasticity of product demand (Lindbeck

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[6]Standard assumptions include that firms' costs are linearly homogeneous in nominal inputs prices; the production function is linearly homogeneous and features constant returns to scale; markets clear; labour and capital services are supplied elastically to the firm; there is perfect competition in the product market (and therefore prices equal their marginal cost), and factor prices are rewarded their marginal productivities.

[7]For example, Slaughter (2001) relies on unconstrained and constant-output-elasticity labour demands, while Hijzen and Swaim (2010) choose to work with a capital-constrained labour demand model in view of the measurement problems with the user cost of capital. In contrast, Adam and Moutos (2014) estimate a constrained labour demand holding output constant, not capital

[8]For example, in a capital-constrained labour demand equation, the estimated wage coefficient is a proxy of the total effect, as defined by Hamermesh (1993), while in a labour demand holding out constant it is just the substitution effect what is captured (that is, the elasticity of substitution between capital and labour).

and Snower, 1994). Foreign determinants (such as the degree of trade openness) may also play a role in labour demand, as explained in Rodrik (1997) and explored in Krishna *et al* (2001), Hijzen and Swaim (2010) or Adam and Moutos (2014) among others

It is standard in this literature (see, for instance, Antràs, 2004) to assume that technological progress grows at a constant rate. In the empirical counterparts, this variable is proxied through a linear trend, which in a Cobb-Douglas context, takes exactly the same coefficient than wages with opposite sign. In our empirical analysis, we substitute the standard linear trend by labour productivity. This is important for a twofold reason. First, in the context of Spanish regions it is hard to assume a linear trend, since it would imply a complete absence of technological (internal) catching-up, in spite of the policies implemented towards this objective (mainly through EU structural funds). Second, to have labour productivity not only allows variation in economic efficiency across regions, but also through time.[9] Finally, if the restriction that wages and labour productivity display the same coefficient with opposite sign is accepted, we may replace both variables by the labour income share, which would appear as a determinant of employment. Therefore, we could examine the effect of the falling trend of this variable since the 1980's on regional employment. Furthermore, by analysing this determinant of labour demand we may assess whether the pressure over the labour share (after the series of labour market reforms than have pushed wages down) has been successful in terms of job creation.

2.2 Wage setting

The wage setting curve represents a positive relationship between wages and employment (or negative with respect to unemployment). It can be obtained from nominal wage setting and price setting rules (Nickell, 1998; Nunziata, 2005), but it can also be conceived in terms of real wages (Hatton, 2007).

Two major strands of literature justify the positive relationship between wages and employment. The first one is related to efficiency wages, the second one to the insider-outsider models. The existence of imperfect information in labour markets gives rise to moral hazard and adverse selection problems. In order to minimise the relevance of such problems, firms have incentives to set wages above market clearing levels because such higher wages allow a better control of the workers and a more efficient selection process. The resulting involuntary unemployment resulting: (i) acts as a worker self-discipline device, and thus reduces the moral hazard problem (Shapiro, and Stiglitz, 1984); and (ii) allows for a tighter filtering of candidates thereby curtailing the adverse selection problem.

In the case of Insider-Outsider models (Lindbeck and Snower, 2001) the workers take

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[9]Adam and Moutos (2014) have also used labour productivity in their estimated labour demand models. However, their aim is "to control for shifts in labour demand arising from changes in firms' required labour to produce a given level of output, as well as in firms' ability to pay for labour services".

advantage of existing labour market regulations to push for higher wages. Firms have to face labour turnover costs (LTC) on account of these regulations, and are willing to accept higher than equilibrium wages to avoid incurring in such costs. For a given level of LTC, the higher the employment levels, the more strong is the workers' position and the more they press to secure a better compensation.

The idea of effort or enhanced productivity surrounding the efficiency wage models, in their moral hazard or adverse selection versions, connects wages with labour productivity in the associated microfounded models. In turn, the idea of labour turnover costs and, more generally, the incidence of labour market regulations and institutions on labour costs and the wage bargaining position of workers, is what brings into the scene the so-called wage pressure factors.

Blanchard and Katz (1999) reconciled these two strands of literature, which are to be seen as complementary, by postulating a benchmark wage setting equation such that:

$$W_t = f\left(\ PR_t\ ,\ u_t\ ,\ wage - push\ elements\right), \tag{2}$$

where PR denotes labour productivity, u is the unemployment rate, and the wage-push factors are representative of four wide areas of regulation: (i) Union power; (ii) Employment protection legislation; (iii) Unemployment protection legislation; and (iv) Fiscal wedges.

There is abundant literature on the role of such wage-pressure factors on unemployment, which is of course conditioned on data availability for the economy under scrutiny. In our case, we consider two relevant elements. The real minimum wage, which is a regulation protecting employees and has been operational during all our sample period; and social security benefits (as a percent of GDP), which are representative of the overall welfare state, and we regard as a summary variable of the regulations affecting workers (note that such benefits are the counterpart of payroll taxes and, simultaneously, reflect all protecting legislation channelled via the Social Security). This is in addition to oil prices, considered on account of the pressure they are likely to exert on prices, which could have a detrimental impact on real compensation (hence the expected negative sign).

A key elasticity amid the wage setting curve is the one measuring how sensitive wages are with respect to labour productivity. Blanchard and Katz (1999) state that real wages and productivity should be homogeneous of degree 1 in the long run because this is consistent with the fact that technological change does not lead to a persistent trend in unemployment. However, the fact that growth drivers in general, and technological change in particular, have no persistent effects on unemployment has been contested in the literature (see, for example, Karanassou *et al.*, 2010, and references therein).

In our study we leave this issue as an empirical matter. We do not a-priory constrain this long run elasticity because this could conceal relevant contrasts in regional behaviour.

Moreover, in case this one-to-one relationship does not hold, it would imply the existence of a persistent wage-productivity gap (since wages do not catch up with productivity even in the long run). We explore the consequences of such situation on employment because most of the labour market policies implemented in Spain have tended to focus on controlling labour costs, mainly (in successive waves of labour market reforms) through a universal use of temporary jobs, a generous system of payroll tax allowances on new permanent contracts, and cuts in the actual cost of severance payments. In contrast, there has been little emphasis in policies aiming to foster labour productivity as indicated (in labour market terms) by the low development of active labour market policies, and the low incidence of on-the-job training, which has not been targeted by public administrators. As a result, labour productivity in Spain behaves in a complete counter-cyclical manner since the rise and fall in employment, in good and bad times respectively, always exceeds the rise and fall in output.

How does the wage-productivity gap affect employment across types of regions? How has the emphasis of recent implemented policies on internal devaluation affected job creation across regions? Would fostering growth and gross capital formation be an alternative? Where and to what extent? These are questions we seek to answer with the analysis that follows.

2.3   Estimated models

Following the previous discussion, we estimate the following dynamic models.

The labour demand model is specified as:

$$n_{i,t} = v_i^N + \mu_t^N + \sum_{j=1}^J \alpha_j^N n_{i,t-j} + \sum_{j=0}^J \beta_j^N ls_{i,t-j} + \sum_{j=0}^J \gamma_j^N k_{i,t-j} + \sum_{j=0}^J \delta_{s,i,j}^N \mathbf{X}_{s,i,t-j}^N + \varepsilon_{i,t}^N, \quad (3)$$

where n is employment, ls is the labour income share, k is the stock of capital, and $\mathbf{X}$ is a vector of s additional controls; t denotes time, i denotes region, and j denotes lags; v_i represent regional dummies, μ_t represent time dummies; the α's, the β's, the γ's and the δ's are parameters to be estimated; and ε is the error term.

In turn, the wage setting model is represented by:

$$w_{i,t} = v_i^W + \mu_t^W + \sum_{j=1}^J \alpha_j^W w_{i,t-j} + \sum_{j=0}^J \beta_j^W pr_{i,t-j} + \sum_{j=0}^J \delta_{s,i,j}^W \mathbf{X}_{s,i,t-j}^W + \varepsilon_{i,t}^W, \quad (4)$$

where w is the gross real wage, and pr is labour productivity.

3 Results

3.1 Data

Our data sources are diverse and include the OECD's *Economic Outlook*, the BD-REMS dataset (from the Spanish Ministry of Finance), and Datastream. All regional data are taken from the BD-MORES, supplied by the *Instituto Valenciano de Investigaciones Económicas* (IVIE) and the Spanish Ministry of Finance. This dataset provides regional accounting-type data on gross value added, labour compensation (including an imputation for self-employed), capital stock, total employment, wage-earners, and the unemployment rate.[10]

Full details on each variable, and its respective source, are given Table 1. Employment (n_i) is the log of total employees in region i; k_i is the log of total regional capital stock; pr_i is regional productivity, measured as the log of total regional gross value added to the number of employees; and w_i is the log of the real wage. To capture the effects of aggregate product demand on labour demand, we include the ratio of regional consumption over regional GDP (cs_i) as a regional control variable. The labour demand equation also includes several nation-wide exogenous variables: *open* is the log of openness, defined as total exports plus total imports over GDP, while r is the real interest rate, defined as the difference between the nominal three-month interest rate minus the inflation rate, which in turn is defined as the one-year percentage change in the GDP deflator. The degree of openness measures the impact of increased trade flows on labour demand due to globalization, whereas the interest rate aims at proxying the real user cost of capital. In the wage-setting equation we also consider several nation-wide control variables, capturing wage-push determinants. These are social security benefits as a percent of GDP (b), the real minimum wage (mw), real oil prices (oil), and the unemployment rate (u) as a measure of labour market tightness.

We have tried several additional controls, such as financial wealth (measured as the ratio of the Madrid stock exchange index over productivity), direct and indirect taxes as a percent of GDP, or the real effective exchange rate. None of them were significant in our estimations. Furthermore, we explored an alternative to the use of the real interest rate, such as the change in real money balances. Results were similar to those reported below.

A final word of caution must be given. When empirically working with the labour

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[10] The Spanish Labour Force Survey has undergone major methodical breaks during our period of analysis, which precludes the use of long time series. One of the advantages of the BD-MORES is that it provides homogeneous data on labour market variables for the 1980-2011 period.

share we should recall that the definition of the labour share is

$$ls = \frac{wage\ bill}{GDP} = \frac{wage\ bill\ /\ employees}{GDP\ /\ employees} = \frac{avg.\ wage}{pr} \tag{5}$$

In our case, the wage bill provided by the BD-MORES includes an imputation for the labour income of the self-employed, which makes the adjustment suggested by Gollin (2002) or Karanassou and Sala (2014) unnecessary. In addition, the standard measure of GDP is provided at market prices, which includes taxes on production and imports, but not subsidies. Since these taxes and subsidies are not regarded as components of generated income, they need to be excluded from the definition of GDP. This is the reason why we make use of the GDP at basic prices (also provided by the BD-MORES).

For the reasons given, the labour income share is computed according to equation (5). Subsequently, we retrieve the average wage as $W = \frac{ls*Y}{N}$, where Y is GDP and N is total employment (not in logs). Therefore, our measure of the labour share can be regarded as the wage-productivity gap, $w - pr$, and is fully consistent with the variables used in the estimation of the wage setting equation.

Table 1. Definitions of variables.

REGIONAL VARIABLES		NATIONAL VARIABLES	
ls_i	labour share $(= w_i - pr_i)$	$open$	openness (%)
n_i	total employment	r	real interest rate (%)
k_i	total capital stock	b	social security benefits (% of GDP)
w_i	average real total compensation	mw	real minimum wage
pr_i	labour productivity	oil	real oil prices
cs_i	private consumption (% of GDP)	u	unemployment rate (%)

Notes: all variables in logs unless otherwise indicated.

Sources: OECD ($open$, b, mw), IMF (oil), BD-REMS (r) and BD-MORES (rest of the variables).

3.2 Empirical methodology

Before estimating our models, our first modelling choice was the split of the 17 Spanish regions into two groups, based on the behaviour of their relative income. We have followed the classification used by the EU to target structural funding, and thus classified Spanish regions into a Low Income (high unemployment) group, made of the 9 Spanish Objective 1 regions plus Cantabria, which has been awarded a transitory status, and a High Income (low unemployment) group, made of the remaining 7 regions. Table 2 summarises our classification.

Estimation of equations (3) and (4) involves several steps. We follow the ARDL approach to cointegration analysis proposed by Pesaran (1997), Pesaran and Shin (1999)

and Pesaran *et al.* (2001), which overcomes many of the problems of the traditional approach to the analysis and identification of long run relationships, especially those related to unit root tests (see inter alia Cochrane, 1991; or Perron and Ng, 1996). These authors show that tests for unit roots have low power in finite samples against the local alternative of a root close to, but below unity (Cochrane, 1991). In this context, the main advantage of relying on the ARDL approach as a testing and estimation strategy is that it can be applied irrespective of whether the involved regressors are stationary or not, and therefore can avoid the pre-testing problems associated with the standard cointegration analysis.

Table 2. Classification of Spanish regions.

HIGH INCOME REGIONS	LOW INCOME REGIONS
Aragon	Andalusia
Balearic Islands	Asturias
Catalonia	Canary Islands
Madrid	Cantabria
Navarre	Castilla-La Mancha
Basque Country	Castilla and Leon
La Rioja	Extremadura
	Galicia
	Murcia
	Valencia

Note: Regions clustered depending on their relative income.

The initial step consists in identifying the optimal lag structure of each model. Thus, for each group of Spanish regions, we construct a panel (including regional fixed effects) and run a first estimation of equations (3)-(4) by OLS. Then we used standard statistical information criteria (e.g., the Akaike Information Criterion, AIC) to determine the optimal lag length for each endogenous and exogenous variables. However, the presence of the lagged endogenous variable on the right hand side in the standard fixed effects model gives rise to the well-known Nickell bias (Nickell, 1981). Following the usual procedure in the literature (Wooldridge, 2010) we first difference the data to eliminate the fixed effects, and apply the General Method of Moments (GMM) estimator, as suggested by Arellano and Bond (1991) or Blundell and Bond (1998).

Consequently, we estimate the selected specification of the labour demand and wage setting equations by GMM to identify the short run and long run elasticities by group of regions. The former refers to the estimated coefficients from equations (3) and (4), whereas the latter refers to the long run solution of the models. This involves assuming that growing variables stabilise around a long run value, so that the long run solution of the dynamic models may be derived as:

$$n_i^* = \frac{v_i^N}{1 - \sum_j \alpha_j^N} + \frac{\sum_j \beta_j^N}{1 - \sum_j \alpha_j^N} ls_i^* + \frac{\sum_j \gamma_j^N}{1 - \sum_j \alpha_j^N} k_i^* + \frac{\sum_j \delta_j^N}{1 - \sum_j \alpha_j^N} \mathbf{x}_i^{N*} \qquad (6)$$

and

$$w_i^* = \frac{v_i^W}{1 - \sum_j \alpha_j^W} + \frac{\sum_j \beta_j^W}{1 - \sum_j \alpha_j^W} pr_i^* + \frac{\sum_j \delta_j^W}{1 - \sum_j \alpha_j^W} \mathbf{x}_i^{W*} \qquad (7)$$

where an asterisk denotes the long run value of the variable. These solutions measure the long run impact of a unit change in each exogenous variables, once the dynamics have been settled down.[11]

3.3 Estimates

Tables 3 and 4 summarise our results for the labour demand and wage-setting equations. Each table supplies the results for the High and Low income groups of regions, and the corresponding OLS and GMM estimates. In general, all variables are statistically significant at the standard confidence levels and show the expected signs.

The validity of the instruments in the GMM approach can be tested by the Sargan test, as well as the Arellano-Bond $M1$ and $M2$ autocorrelation tests. Tables 3 and 4 show that the $p-$value for the Sargan tests does not allow rejection of the null that the over-identifying restrictions are valid. Moreover, the $M1$ and $M2$ statistics indicate that residuals in both equations, and for both groups of regions, show first-order but not second-order autocorrelation.

The overall picture that emerges from these estimates, together with the long run solutions of the models (summarised in Tables 5 and 6), is the existence of a dual regional employment growth pattern.

Starting with the labour demand equation, we observe that the degree of persistence is rather large and similar in both groups: 0.84 and 0.91 in the high and low income groups, as obtained from the addition of the two lagged dependent variables. This is a crucial feature which, on one side, reflects some larger average adjustment costs in the low income regions; and, on the other, implies that differences in the long-run impact of the variables will mainly arise from the short-run coefficients on those variables –recall equations (6) and (7). Note, for example, that the addition of the labour share coefficients implies a much larger sensitivity of employment to this variable in the high income regions. This is then translated into the long-run elasticities of -0.94 and -0.49, respectively, as shown

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[11]See Karanassou *et al.* (2010) for a discussion about short run, long run and steady state solutions of a dynamic equation.

in Table 5. In turn, the level of the capital stock is only significant in the high income group, while the impact of investment (Δk) is significant in both groups, but with a larger sensitivity in the low income regions.

Table 3. Labour demand equation.

| | HIGH INCOME REGIONS | | | | LOW INCOME REGIONS | | | |
| | OLS | | GMM | | OLS | | GMM | |
	coef.	p-val.	coef.	p-val.	coef.	p-val.	coef.	p-val.
n_{t-1}	1.336** (21.23)	0.00	1.298** (20.58)	0.00	1.294** (26.21)	0.00	1.216** (27.35)	0.00
n_{t-2}	−0.490** (−8.21)	0.00	−0.462** (−7.81)	0.00	−0.348** (−7.22)	0.00	−0.307** (−7.82)	0.00
ls_t	0.244** (4.56)	0.00	0.225** (4.20)	0.00	0.118** (2.66)	0.00	0.091** (2.86)	0.00
ls_{t-1}	−0.365** (−6.79)	0.00	−0.380** (−7.08)	0.00	−0.142** (−3.19)	0.00	−0.136** (−2.99)	0.00
k_t	0.066** (4.30)	0.00	0.070** (4.50)	0.00	0.002 (0.26)	0.78	0.021 (0.98)	0.32
Δk_t	1.104** (5.19)	0.00	1.085** (5.20)	0.00	1.182** (7.87)	0.00	1.315** (5.85)	0.00
Δk_{t-1}	−0.549* (−2.49)	0.01	−0.451* (−2.06)	0.04				
Δk_{t-2}					−0.871** (−6.16)	0.00	−0.804** (−4.82)	0.00
$open_t$	0.218** (4.81)	0.00	0.229** (5.16)	0.00				
$open_{t-1}$	−0.230** (−4.37)	0.00	−0.224** (−4.35)	0.00				
$\Delta open_t$					0.200** (5.58)	0.00	0.186** (6.87)	
r_t	−0.421** (−5.78)	0.00	−0.421** (−5.93)	0.00				
r_{t-1}	−0.155** (−2.57)	0.00	−0.162** (−2.73)	0.00	−0.320** (−6.88)	0.00	−0.321** (−6.64)	0.00
c_{t-1}	0.205** (4.04)	0.00	0.260** (4.87)	0.00	0.063** (1.52)	0.12	0.120** (2.46)	0.01
LL	571.91		$Sargan$	187.05 (0.422)	LL	767.85	$Sargan$	229.08 (0.13)
AIC	−5.265		$m1$	−7.51 (0.00)	AIC	−5.15	$m1$	−7.53 (0.00)
			$m2$	1.73 (0.10)			$m2$	0.994 (0.31)

Notes: OLS refers to the one-way fixed effects model. GMM refers to the Arellano-Bond first-difference generalised method of moments. Standard-errors in parentheses for estimated coefficients. LL is the maximised value of the log-likelihood function, AIC is the value of the Akaike Information Criteria. $Sargan$ is the value of the Sargan test. $m1$ and $m2$ refer to the Arellano-Bond autocorrelation test for residuals. p-values in parenthesis for the $Sargan$, $m1$ and $m2$ tests. ** significant at 1%; * significant at 5%.

A dual pattern is thus identified, in which the high income group is more reactive to the labour share, and the low income group is more sensitive to investment. This may be related to different technological levels at the regional level. It is likely that investment generates a greater income and employment effect on the low income regions due to larger economies of scale. The remaining variables in the labour demand equations behave in line with theoretical priors. Real interest rates have the expected negative influence on employment, which is remarkably similar across groups of regions (note that both estimated long run elasticities are around -3.5). In turn, consumption impacts positively on labour demand, reflecting significant aggregate product demand effects which, again, have similar long-run elasticities (1.58 and 1.33 for the high and low income regions). Finally, the degree of openness impacts positively on employment only in the high income group of regions (0.03), probably reflecting their better level of competitiveness.

Table 4. Wage setting equation.

	HIGH INCOME REGIONS				LOW INCOME REGIONS			
	OLS		GMM		OLS		GMM	
	coef.	p-val.	coef.	p-val.	coef.	p-val.	coef.	p-val.
w_{t-1}	0.752** (12.85)	0.00	0.753** (12.92)	0.00	0.687** (14.88)	0.00	0.601** (12.52)	0.00
w_{t-2}	0.128* (2.21)	0.02	0.132* (2.31)	0.02	0.145** (3.45)	0.00	0.144** (3.09)	0.00
pr_t	0.463** (7.58)	0.00	0.462** (7.62)	0.00	0.483** (8.11)	0.00	0.460** (7.87)	0.00
pr_{t-1}	−0.407** (−6.70)	0.00	−0.415** (−6.87)	0.00	−0.375** (−8.68)	0.00	−0.310** (−6.04)	0.00
b_t					2.132** (7.40)	0.00	2.366** (7.12)	0.00
b_{t-1}					−1.820** (−6.85)	0.00	−1.446** (−5.99)	0.00
Δb_t	1.41** (5.06)	0.00	1.423** (5.20)	0.00				
u_t					−0.067 (−1.38)	0.16	−0.175** (−2.47)	0.01
mw_t	0.094** (2.76)	0.00	0.094** (2.81)	0.00	0.067 (1.46)	0.14	0.022 (0.51)	0.60
oil_t	−0.011** (−3.41)	0.00	−0.011** (−3.52)	0.00				
oil_{t-1}					−0.018** (−5.19)	0.00	−0.017** (−5.30)	0.00
LL	546.19		Sargan	188.00 (0.40)	LL	766.36	Sargan	243.59 (0.10)
AIC	-5.068		$m1$	−8.315 (0.00)	AIC	−4.98	$m1$	−8.561 (0.00)
			$m2$	0.793 (0.42)			$m2$	−0.435 (0.66)

Notes: see notes to Table 3

As regards the wage setting equation (Tables 4 and 6), the hypothesis of a unitary long-run elasticity of wages with respect to productivity is strongly rejected by the data. It just attains 0.41 in the high income regions and 0.58 in the low income ones. This is essentially the outcome of the larger short-run sensitivity in the latter (0.15 versus 0.05), and also of its mild smaller persistence (0.754 versus 0.885, arising from the addition of the two lags of the real wage).

The control variables have also a diverse impact across regions. Minimum wages appear as a much relevant wage pressure factor in the high income regions than in the low income ones. This is consistent with their larger sensitivity of employment to the wage gap. In contrast, it is not the level of Social Security benefits what impacts in the rich regions, but its change (hence the absence of a long-run elasticity with respect to the level). In the low income regions, on the contrary, the long-run elasticity of wages with respect to benefits is high (3.62). This larger pressure of benefits is probably reflecting greater labour market difficulties in these regions which, in turn, would be reflected in the wage response to the rate of unemployment. Wages react significantly to higher rates of unemployment in the low income regions, but not in the rich ones.

Table 5. Labour demand. Long run elasticities.

		ls	k	Δk	$open$	r	cs
HIGH INCOME REGIONS:	OLS	−0.779	0.432	3.598	−0.075	−3.738	1.330
	GMM	−0.943	0.425	3.855	0.030	−3.548	1.585
LOW INCOME REGIONS:	OLS	−0.434	0.051*	5.754	-	−5.948	1.180*
	GMM	−0.493	0.234*	5.626	-	−3.541	1.330

Notes: values computed from estimated coefficients in Table 3; * denotes non-significant level coefficient.

Table 6. Wage equation. Long run elasticities.

		pr	mw	b	u	oil
HIGH INCOME REGIONS:	OLS	0.469	0.799	−	−	−0.098
	GMM	0.412	0.826	−	−	−0.104
LOW INCOME REGIONS:	OLS	0.639	0.404*	1.861	−0.402∗	−0.109
	GMM	0.587	0.087*	3.620	−0.690	−0.067

Notes: values computed from estimated coefficients in Table 4; * denotes non-significant level coefficient.

These results suggest the existence of a dual pattern in the Spanish regions, both in terms of employment growth and wage setting, in spite of sharing the same institutional setting. Moreover, our findings confirm and reinforce those in Bande *et al.* (2008).

Figure 1 shows the fitted values corresponding to the employment and real wage equations estimated for the low and high income regions. The fitted values track very

closely the actual evolution of the explained variables, with mild discrepancies only in the 1980s for real wages in the high income regions. Note, however, that our simulations comprise the 1990s and 2000s and are therefore based on a faithful representation of the facts.

Figure 1. Fitted values.
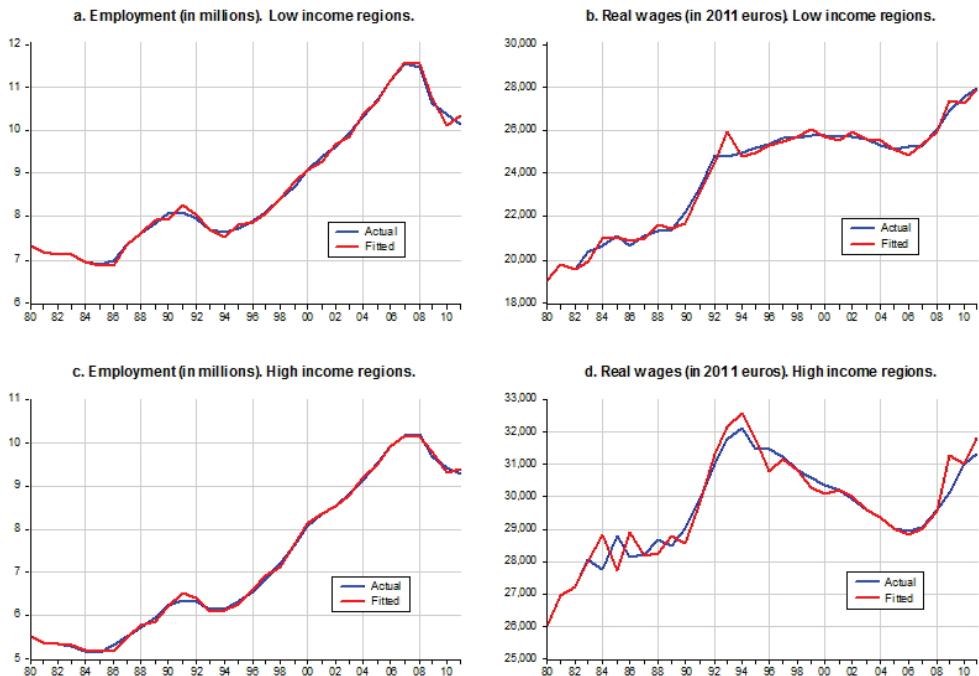
4   Learning from counterfactuals

Having found that the labour share and investment impact quite differently on the High and the Low income groups of regions, we may wonder what has been the contribution of these variables to the actual evolution of employment. To this end, and following the methodology proposed by Karanassou and Sala (2014), we now run a number of counterfactual simulations. These consist in fixing the value of one of these exogenous variables at a certain level, and solve dynamically the estimated labour demand, allowing the remaining exogenous variables to take their actual values. The corresponding simulated employment level may be interpreted as the level of employment that the group of regions would have showed had the exogenous variable under scrutiny remained constant. In addition, the difference between the two (actual and simulated trajectories) is the dynamic contribution of that exogenous variable to the trajectory of employment.

4.1 Counterfactual scenarios

We focus on three significant periods: 1993-1999, 1999-2007, and 2007-2011. The first two cover a long span of job creation (starting in 1995) and coincide with significant institutional and regulatory changes such as the achievement of the Common Market, in the first case; the achievement of the European and Monetary Union in the second; and a variety of labour market and fiscal reforms that plagued those years. In turn, the third period covers the aftermath of the Global Financial Crisis (GFC) with the burst of the housing bubble and the collapse of the saving banks (which accounted for more than half of the financial sector in Spain in terms of credits, deposits and customers).

Figure 2. Counterfactuals.

a. Labour share. Low income regions.

b. Rate of capital accumulation. Low income regions.

c. Labour share. High income regions.

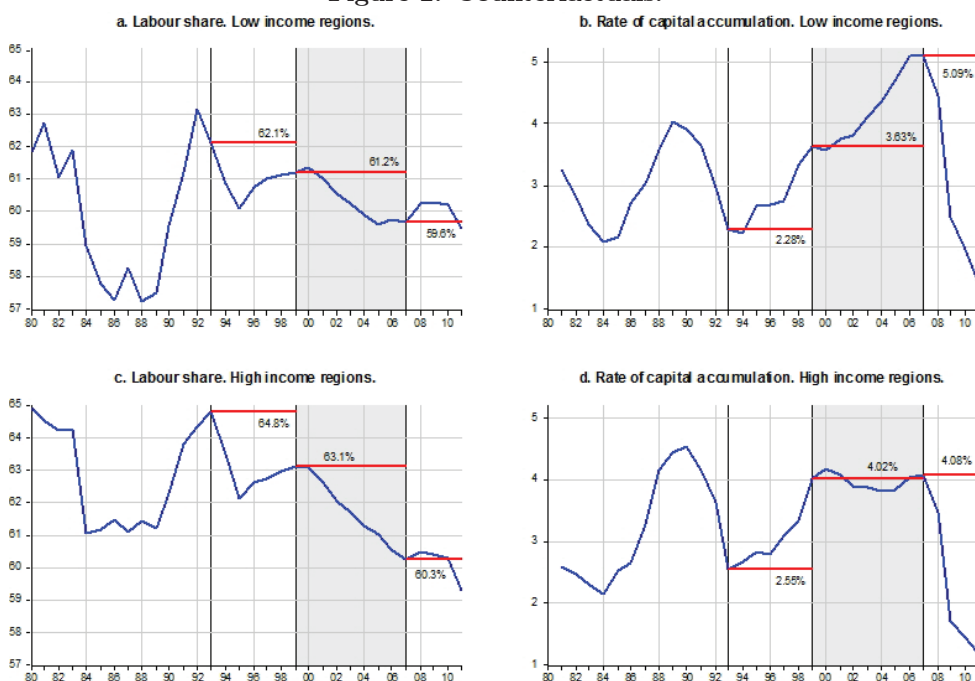d. Rate of capital accumulation. High income regions.

Figure 2 shows that 1993, 1999 and 2007 broadly coincide with inflection points in the time path of the labour share and the rate of capital accumulation. Regarding the labour share, 1992 and 1993 were the peak years in the Low and High income groups, respectively, resulting from the break in the income policy agreements that lasted until 1987, and the subsequent period of real wage growth (see Figures 1b and 1d).[12] Therefore,

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[12] After democracy restoring (1977), and up to 1987, different agreements between representatives of firms, trade unions and the governement were in place to break the wage-price spiral brought by the oil price shocks. The result was a slow progess in real wages in a context of intensive job destruction. Hence the fall in the labour share. When sustained growth was regained in the second half of the 1980s, income

when fixing the values of the labour share in 1993 we will be able to evaluate the impact of its fall during the three periods examined. On this account, note that the shock is larger in the high income regions (Figure 2c), where it falls by 1.7 percentage points (pp) between 1993 and 1999 (0.9 in the low income regions, Figure 2a); 2.8 pp in 1999-2007 (1.6 in the low income regions); and 1 pp in 2007-2011 (0.1 in the low income regions) after increasing mildly, along with the collapse in output, during 2008-2010.

With respect to the rate of capital accumulation, there is a first, long span of accelerating growth rates, followed by a steep deceleration along with the burst of the housing bubble. In contrast to the changes in the labour shares, the low income regions display wider oscillations than the high income ones. In the first period, the rate of capital accumulation changes by a similar magnitude in both areas: 1.35 percentage points in the low income regions and 1.47 in the high income ones. However, in the second and third periods both the rise and fall of these rates are larger. There is an increase of 1.46 pp in the low income regions between 1999-2007, in contrast to the flat trajectory in the high income regions, while there is a steep fall of 3.69 pp in 2007-2011 (from 5.09% to 1.50%), larger than the 2.88 pp deceleration recorded in the high income regions.

4.2   Employment simulations

Figures 3 and 4 show the results of the dynamic simulations for the employment trajectories corresponding, respectively, to the low and high income regions.

Employment grew by 1.0 million between 1993 and 1999 in the low income regions, and 1.5 millions in the high income regions. The labour share and capital accumulation jointly account for between a third and 40% of this evolution, with significant differences across areas.

In the low income regions, the incidence of the labour share is negligible, as shown by Figure 3a, and only accounts for 3% of the progress in employment (30,000 jobs, out of 1 million increase). In contrast, the acceleration in the rate of capital accumulation explains 37% of the job creation (close to 370,000 jobs). These contributions are much more balanced in the high income regions, where the labour share explains 18.4% of the jobs created (around 270,000), while capital accumulation accounts for another 15.5% (close to 230,000 jobs). In total, half million jobs out of 1,5 millions in this area.

The contribution of the labour share in the low income regions remains negligible in 1999-2007 (Figure 3c). In turn, the acceleration in the rate of capital accumulation accounts for 23.9% of more than 2.8 million jobs created in this area, which amounts to 670,000 jobs (Figure 3d). This outcome is somewhat reversed in the high income regions, where the fall in the labour share accounts for 360,000 jobs out of 2,5 millions (14.4%),

policy agreements came to an end, and the massive general strike in 1988 gave rise to a new period of real wage growth.

while there is virtually no contribution from changes is the capital stock. This is the outcome of the stability in the rate of capital accumulation around 4% (Figure 2d). We are not claiming, therefore, that the boom in investment was innocuous to job creation; the exercise just highlights the fact that low income regions did benefit more from the continued acceleration in the rate of capital accumulation, in contrast to the high income regions, where the flat evolution of that rate did not contribute by more than it was doing in 1999.

Figure 3. Dynamic simulations for employment. Low income regions.
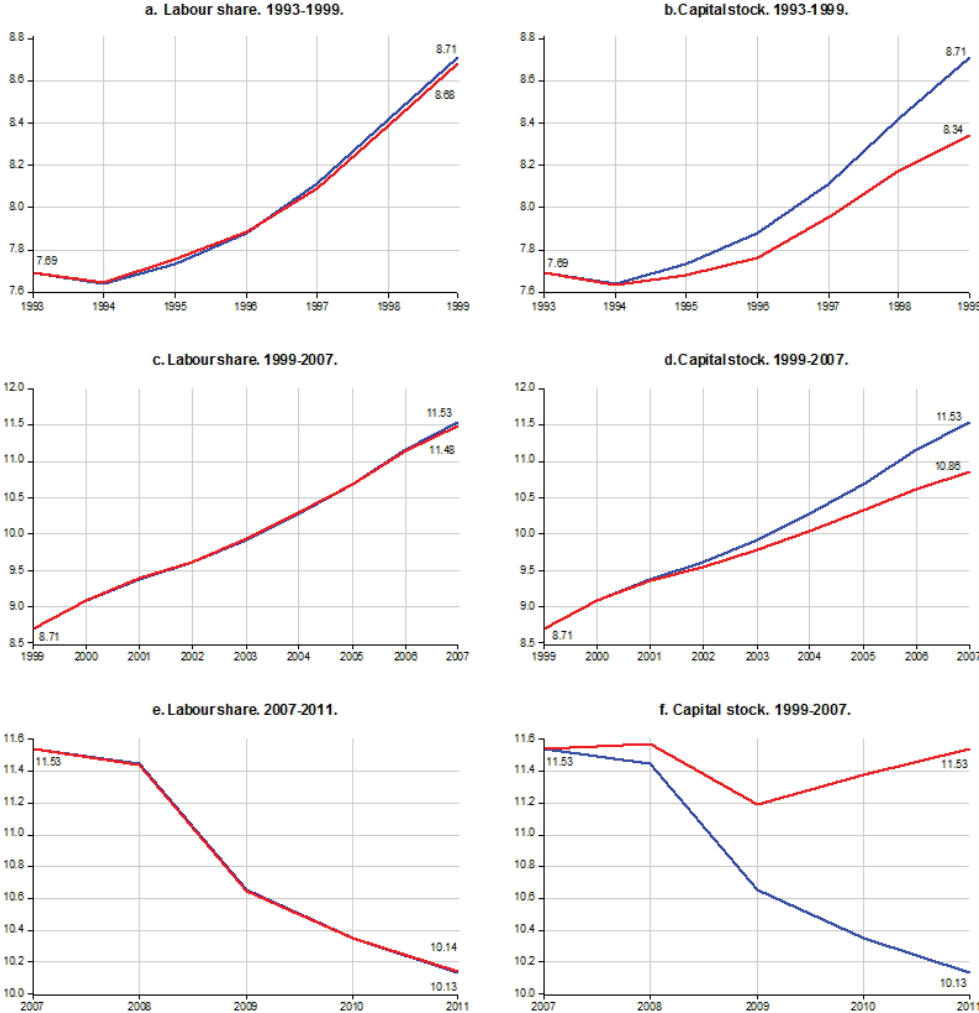
In contrast to the dissimilar experiences of 1993-1999 and 1999-2007, the third period reveals a common behaviour. The evolution of the labour share is non-influential even in

the high income regions (recall the little magnitude of the shock, as depicted in Figures 2b and 2d), while fading investment and the corresponding steep fall in the rate of capital accumulation is able, on its own, to fully explain the employment trajectories (Figures 3f and 4f).

Figure 4. Dynamic simulations for employment. High income regions.
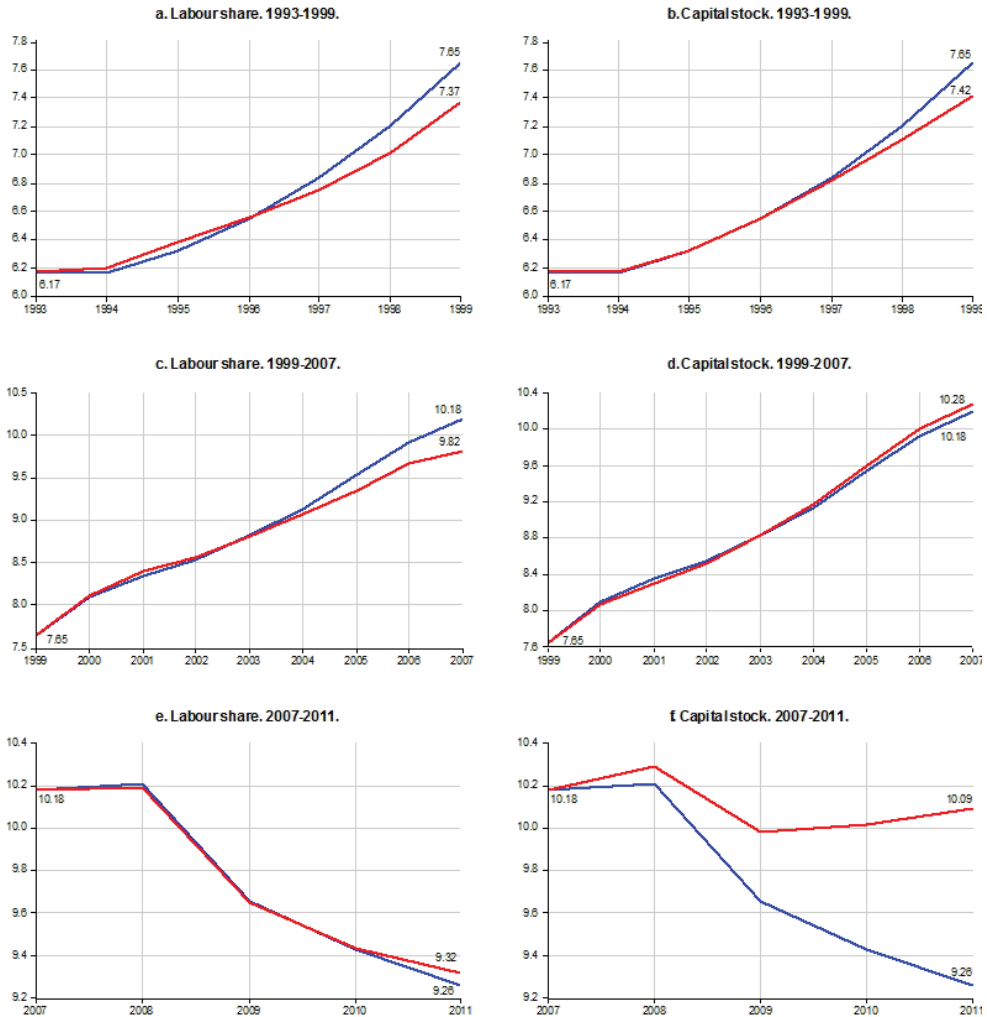
More precisely, it explains 100% of the fall in the low income regions, since employment would have remained exactly at 11.53 millions in the absence of the collapse in investment. In contrast, actual employment went down by 1.4 millions to 10.13. In the high income regions, it explains 90.2% of this fall; that is, more than 800,000 jobs out of an actual loss of 920,000.

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Overall, the loss in Spain of 2.2 million jobs in those years (1.4+0.8) can be fully ascribed to the fall in investment. We know that the big collapse in investment took place immediately afterwards the GFC. Therefore, the years up to 2011 depict a period in which the rate of capital accumulation exerted utmost influence on economic activity and job creation. Subsequently, austerity policies were further emphasized with the extensive 2012 labour market reform. This may have had significant influence on the recent labour market performance and requires further analysis. Meanwhile, our estimated models of wage setting can be used to highlight the role played by labour productivity on the wage trajectories.

4.3 Real wage simulations and employment effects

The most crucial finding of our wage setting estimates is the absence of a one-to-one long run relationship between wages and productivity. If this relationship was to hold, the labour share would stay constant (in the long run), and in a Cobb-Douglas setting no jobs would be gained from improving labour productivity. What would be the consequence for wages of such one-to-one relationship? To respond to this question, we force the current coefficient on productivity to take a value such that this relationship holds (while maintaining the estimated coefficients on lagged productivity). Hence, we use the following simulation elasticities instead of the estimated ones:[13]

Estimated elasticities:	Simulation elasticities:
$\frac{\beta_1^W + \beta_2^W}{1 - \alpha_1^W - \alpha_2^W}$ [notation from equation (4)]	$\frac{\beta_1^{W'} + \beta_2^W}{1 - \alpha_1^W - \alpha_2^W}$ so that $\varepsilon_{w-pr}^{LR'} = 1$

HI: $\varepsilon_{w-pr}^{LR} = \frac{\hat{\beta}_1^W + \hat{\beta}_2^W}{1 - \hat{\alpha}_1^W - \hat{\alpha}_2^W} = \frac{0.46 - 0.41}{1 - (0.75 + 0.13)} = \frac{0.05}{0.12} = 0.42 \quad \rightarrow \quad \varepsilon_{w-pr}^{LR'} = \frac{0.53 - 0.41}{1 - (0.75 + 0.13)} = \frac{0.12}{0.12} = 1.0$

LI: $\varepsilon_{w-pr}^{LR} = \frac{\hat{\beta}_1^W + \hat{\beta}_2^W}{1 - \hat{\alpha}_1^W - \hat{\alpha}_2^W} = \frac{0.46 - 0.31}{1 - (0.60 + 0.14)} = \frac{0.15}{0.26} = 0.58 \quad \rightarrow \quad \varepsilon_{w-pr}^{LR'} = \frac{0.57 - 0.31}{1 - (0.60 + 0.14)} = \frac{0.26}{0.26} = 1.0$
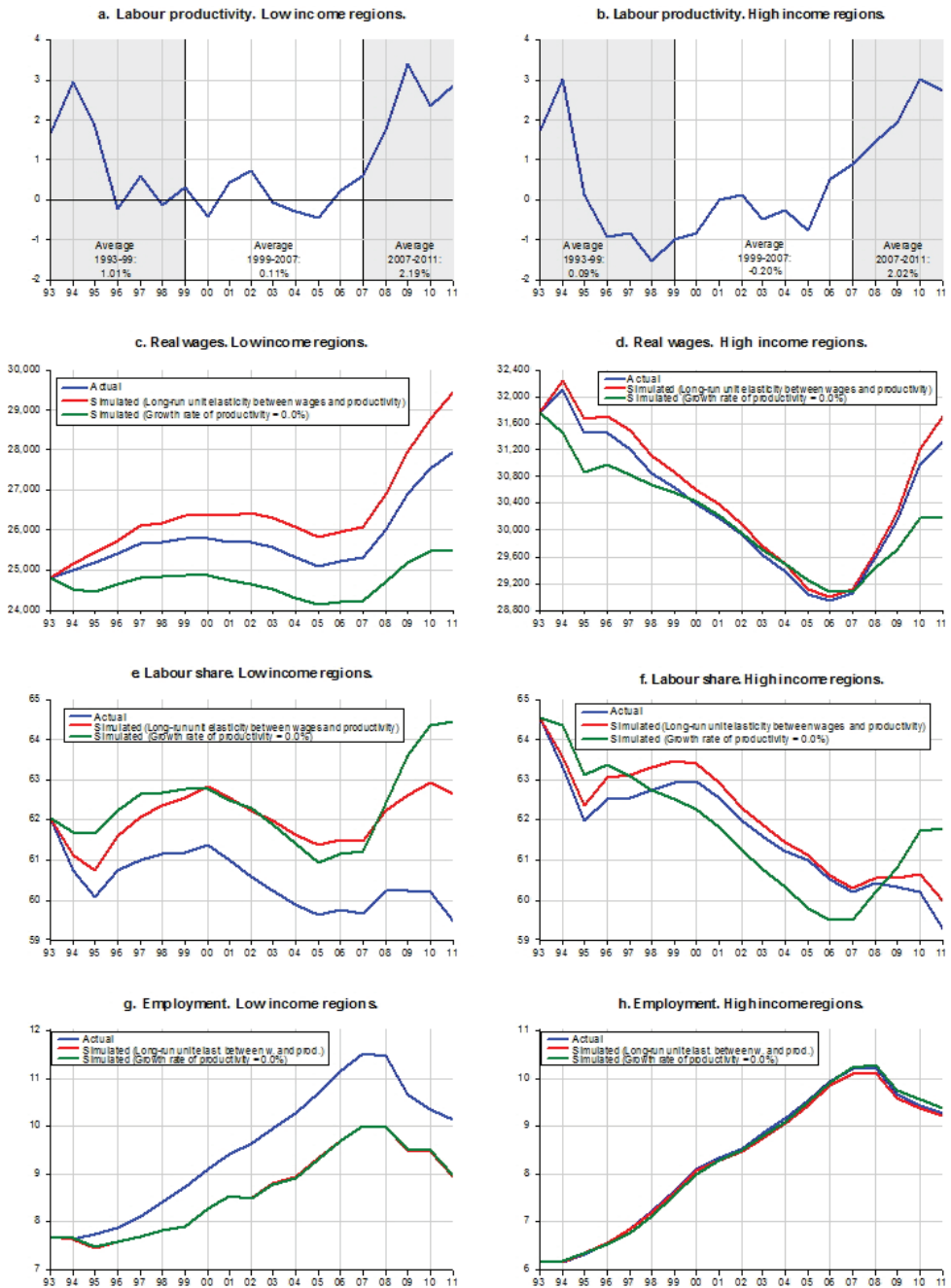
Moreover, we also explore how real wages would have behaved in case of zero productivity growth. This provides us with two extreme scenarios, one in which there are no productivity gains and thus the elasticity of wages with respect to productivity becomes irrelevant, and one in which wages are fully responsive to actual productivity gains. These wage trajectories have strong consequences for the labour share, and can be used to simulate the evolution of employment to see how it would react to policies that leave wages fully independent from productivity changes or policies that try to close the wage gap (and push towards a one-to-one relationship).

Figure 5 presents information on the evolution of labour productivity together with the results of the dynamic simulations for the real wage, labour share, and employment

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[13] ε_{w-pr}^{LR} denotes the long-run elasticity of wages with respect to productivity; HI denotes the High income regions; LI denotes the Low income regions.

trajectories emerging from these two simulated scenarios.

Figure 5. Dynamic simulations for real wages.

a. Labour productivity. Low income regions.

b. Labour productivity. High income regions.

c. Real wages. Low income regions.

d. Real wages. High income regions.

e. Labour share. Low income regions.

f. Labour share. High income regions.

g. Employment. Low income regions.

h. Employment. High income regions.

In Figures 5a-5b, we show that labour productivity has followed a similar path in

both the low and high income regions. There is, however, a difference in the magnitudes recorded in the first period, 1993-1999, in which productivity grew at 1.0% in the former and 0.07% in the later. This stark contrast in the first part of the sample causes the average growth rate of productivity in the low income regions to double the one in the high regions: 0.95% versus 0.46% in 1993-2011.

Figures 5c and 5d show how real wages would have evolved had the growth rate of productivity been 0.0% since 1993. In the low income regions, average real wages would have increased by 3.9% instead of the actual 12.8% (which took them to 28,000 euros). In the high income regions, wages would have decreased by 4.3% instead of falling by just 1.4% (until 31,328 euros). This information illustrates, with specific values, what we learnt from the estimated elasticities: since not all productivity gains end up translated into real wages, the wage gap widens and the labour share falls.

If we take the actual evolution of productivity, but assume a one-to-one long run relationship between wages and productivity, then wages would reflect to a greater extent all productivity gains which, as we have seen, have been very low but still positive since the 1990s. In that case, wages would have increased by 18.8% (to 29,445 euros) in the low income regions, while they would have fallen in the high income regions by 8.7% until 2006, to virtually regain their initial values by the end of the period. This difference is partly due to their different productivity dynamics, with mild positive rates in the low income regions and negative rates in the high income regions in 1995-2007.

This analysis yields one significant outcome: the low income regions, which are the ones were the wage elasticity with respect to productivity is larger and the growth rate of productivity has been higher, would be the most sensitive ones to policies that: (i) increase labour productivity; and (ii) increase the sensitivity of wages with respect to productivity. The first type of policy could be a growth-type policy aiming at improving technology, and thus labour and capital efficiency. The second type of policy could be a change in legislation promoting wage agreements in which wage progress becomes more connected to the workers' performance in terms of productivity (for example, the 2012 labour market reform in Spain).[14] What would be the consequences for employment?

Figures 5e and 5f show the consequences of our wage scenarios for the labour share, while Figures 5g and 5h show them for employment. In the scenario of flat productivity growth, the wage gap in the low income regions narrows and the labour share evolves systematically above its actual trajectory: between 61% and 63% until 2008, then reaching 64.5% in 2011. This implies 5 pp above its actual value. In contrast, in the high income group, the zero productivity growth causes the labour share to display a steeper falling trend during most of the sample period (it ends up above its actual level due to the steep

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[14]See the OECD (2014) assessment of this reform, where the greater priority given to collective bargaining agreements at the firm level is noted as a key measure, and is highlighted as crucial to enhance the internal flexibility of firms.

rise that would have occurred in the absence of productivity growth during the crisis, which is similar to the one in the low income regions).

The narrowing of the wage gap in the low income regions, and its widening (in most of the sample period) in the high income regions, has distinct effects on employment. In the first case (depicted in Figure 5g), it is much lower than actual employment (by more than 1 million in 2011), as a consequence of the higher unit labour costs due to stagnant productivity. In the second case (Figure 5e), the evolution of simulated employment closely tracks actual employment, and no significant effects can be perceived. In the high income regions, not only the elasticity of wages with respect to productivity is lower (as reported in Table 6), but also the average productivity growth rate (Figure 5b), hence rendering this area to be much less sensitive in terms of employment.

These simulations show that policies trying to foster employment through a low productivity growth strategy –i.e., based on a low value added economic model– are deemed to fail. Their effects would tend close to neutral in developed regions, while employment would be reduced in more lagging regions. Thus, not only employment growth would be limited at best in some areas, but regional disparities would markedly increase.

The second scenario in which productivity gains end up fully translated into wages is equally eloquent. Now productivity takes its actual values (it grows), while wages reflect them more intensively (in the short-run) and fully (in the long-run). As a consequence, the simulated labour share is higher than the actual one in the low income regions (Figure 5e). It is remarkable that the resulting path is very similar to the one arising from the previous scenario but, given this similarity, it should come as no surprise to find a very similar employment response (Figure 5g).

In contrast, in the high income regions actual productivity gains have been, on average, about half those in the low income regions, with much of the difference occurring in the early 1990s (Figures 5a an 5b). This explains why, even though simulated wages are also higher, they do not detach much from their actual values (Figure 5d). This is reflected in the trajectory of the labour share, which is also above the actual one (reflecting the enhanced translation of productivity gains into wages), but not much (Figure 5f). Although for different reasons (before we had $\Delta pr = 0$ and $\varepsilon_{w-pr}^{LR} < 1$), this same outcome in terms of the labour share causes similar negligible employment effects.

This second scenario ($\Delta pr > 0$ and $\varepsilon_{w-pr}^{LR} = 1$), therefore, suggests that policies aimed at enhancing the link between wage and productivity growth (i.e., increasing wage responsiveness to productivity gains) may not have the desired effects, since they would cut employment growth in low income regions, while generating a neutral effects in high income regions. Focusing exclusively on the response of wages to productivity would widen regional disparities.

4.4   Discussion

The design of policies to foster employment is not an easy task, especially in the presence of marked regional disparities in labour market performance and a common set of labour market institutions. Our analysis sheds lights on the two main strategies that may be followed.

First, the implementation of growth-enhancing policies focusing on capital accumulation so that high productivity growth can be achieved. Under this approach, employment would be the natural outcome of the combined effect of an aggregate demand boost (due to greater investment) and aggregate supply developments from embodied technological change. Second, cost-control strategies which essentially try to keep wages in line with productivity growth, or gain competitiveness by allowing wages to fall short of productivity growth, i.e., by increasing the wage gap.

These alternatives are not mutually exclusive, and may be combined. In case of weak productivity growth, however, pursuing job creation by increasing the wage gap may require wages to be reduced further and cause unavoidable effects on income distribution (Karanassou and Sala, 2014). Therefore, our results call for more region-specific policies and discard standard labour market reforms as a unique tool to manage the unemployment rate problem. Furthermore, to the extent that investment serves both at fostering capital accumulation and labour productivity (which, in turn, reduces the ULC), regionally-targeted soft credit lines and capital taxes could be helpful in breaking regional sluggishness.

Achieving such policy goals, however, is certainly more difficult today than before for a twofold reason. On the one hand, the restructuring of the Spanish banking system after the GFC has swept regional saving banks, which use to have more regionally-oriented credit strategies. On the other, capital taxes are fully ruled out from the political debate at the national level.

What is left, then? Looking at the recent policies applied in Spain to tackle the high and persistent unemployment problem under the lens of our results does not allow to be optimistic as regards the future evolution of regional employment disparities, let alone aggregate employment. First, growth-enhancing policies have been essentially neglected, since job creation in Spain during the expansionary years before the GFC, and its aftermath (2014-2016), has been based on low value added activities such as building construction, tourism, wholesale and retail. The focus on labour-intensive industries has resulted in weak productivity growth and has prevented wages to progress, as implicitly signalled by our simulations. Wage growth recorded a yearly average of 0.64%, which would have been 0.15% in the absence of productivity growth in the low income regions (Figure 5c). In the high income regions, these rates are, respectively, 0.06% and -0.14% (Figure 5d).

Second, in a context of endemically slow productivity growth, labour legislation has exerted systematic downward pressure on wages to secure job creation via the widening of the wage gap. To exploit this mechanism, the Spanish legislation has tended to foster the atomization of job categories. This has been done by allowing a large variety of contracts and job situations, in which only the compensation of the so-called insiders copes with progress in productivity, in contrast with a vast segment of temporary and outsourced workers liable to a multiplicity of (task-targeted) contracts. Even the few temporary work agencies that dominate the market use their monopsonistic power and enforce flat tariffs not specifically connected to the workers' performance.

In this context, changes in the legislation driving collective agreements to set wages much more in connection to progress in productivity (as expected from the 2012 reform in Spain), could even harm the situation unless significant reforms are undertaken to reduce workers' discrimination issuing from the type of contract. The reason is straightforward: in the event of a wide distribution of productivities across branches of activity and size of firms (Spain is an economy essentially made of SMEs), firm-level agreements connected to specific productivity performances in a context, in addition, of structural difficulties to achieve productivity gains, will surely deliver growing wage dispersion and income inequality. The recent promotion of firm-level agreements does not even guarantee that wages will trail productivity, thus precluding significant employment effects.

5   Conclusions

Labour market reforms are recursively invoked from academics and global institutions to solve the poor performance of the (Spanish) labour market. Policy makers in Spain have responded to this call by introducing systematic legislative changes in last decades (in 1984, 1994, 1997, 2001, 2002, 2010, 2011, and 2012) so as to fight the so-called "unfriendly labour market institutions" and enhance flexibility. As a consequence, the Spanish labour market displays worrying symptoms of a multiple personality disorder. On one side, it is highly volatile and very sensitive to business cycles; on the other side, regional asymmetries are extremely persistent.

In such disturbing context, our main claim is that a more targeted approach is needed. Targeted, to be precise, in a twofold dimension.

First, in regional terms. Although it is true that regions react differently to common policies due to compositional differences (age, gender, education, industry composition or unemployment duration), such compositional differences need to be carefully identified so as to ensure the most efficient outcome of new, and increasingly targeted, economic policies. Second, in orientation. While labour market performance may be more sensitive to legislation changes in some specific regions, other may require other type of measures

more focused on growth stimulus. Examples of such measures are industrial policies that care on R&D&I activities; policies that boost investment (via soft-credit lines or the promotion of joint ventures); and regionally-targeted tax incentives.

Our analysis has shown that the performance of the labour market in the Spanish high income regions is more reactive to capital accumulation, while in the low income regions is more sensitive to low costs (low relative to productivity). This is a useful piece of evidence, that of course will need to be further contrasted, but hopefully will contribute to change the perspective under which we tend to approach the labour market problem.

To conclude, it should be made explicit that our recommendations aim only at identifying the best mechanism to break regional (un)employment persistence in a labour market characterised by its volatility at the aggregate level. The design of policies aiming at regional convergence is far beyond the scope of our analysis, although coordination between the two would certainly be a plus.

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