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Unemployment in Spain: The failure of wage devaluation

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Abstract
This article analyses from a Keynesian approach the effect of wage devaluation on the Spanish labour market during the Great Recession post-2008. It challenges the pro-flexibility literature, which attributes to labour relations reforms the prevention of larger job destruction in the recession and a larger reduction in unemployment during the subsequent expansion. Instead, we examine the role of wage devaluation in the operation of Okun's law and gross domestic product, using an extended version of the Bhaduri–Marglin model. We find that wage devaluation has not significantly modified Okun's law and that through its impact on income distribution, the unemployment rate rose by 1.9 percentage points. We therefore provide evidence for the negative effect of wage devaluation on gross domestic product and the positive effect on the unemployment rate.

JEL Codes: C22, E11, E24

Keywords
Bhaduri–Marglin, labour market, Spanish economy, wage devaluation

Introduction

During the post-2010 debt crisis, European Union (EU), European Central Bank (ECB) and International Monetary Fund (IMF) authorities insisted on the need to address strict fiscal austerity packages (Perez and Matsaganis, 2018) as well as internal devaluation policies through labour market reforms (Armingeon and Baccaro, 2012) in order to correct macroeconomic imbalances. In the case of Spain, these imbalances took the form of an increasing external deficit and debt associated with loss of competitiveness, a growing public deficit and debt, labour market dualism and high levels of unemployment (European

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Commission (EC), 2012). The fundamental aim of the 2010 and 2012 Spanish labour reforms was to increase flexibility in order to improve labour market performance. These structural reforms of the labour market had three main lines of action. First were measures to reduce labour market dualism through a reduction of employment protection of open-ended contracts. Second were measures to decentralise collective bargaining, thus adapting agreements to the particular conditions of firms and employers. Third were measures to encourage the use of internal flexibility tools of firms by reducing restrictions on employers' power to modify work conditions. Along with other programmes, the coverage of labour protection was substantially decreased (Picot and Tassinari, 2017).

In this sense, one might say that the labour market reforms aimed to reduce the countervailing power of workers. According to the theory of power of John Kenneth Galbraith (1983), the goal of countervailing power is to counteract the force of an original power. For instance, employment protection legislation counterweighs the power of employers to hire, fire, organise working time, set wages, and so on. Moreover, Baccaro and Howell (2018) have pointed out that the liberalisation process leads to political and institutional changes aimed at expanding the discretionary power of employers; therefore, liberalisation narrowed the countervailing power of workers.

According to the advocates of flexibilisation (Ministerio de Empleo y Seguridad Social (MEYSS), 2013), the institutional change in the employment and industrial relations systems has a twofold impact as a result of wage moderation and increases in employment flexibility. On the one hand, it prevents an economy from larger job destruction during recessions, generally those provoked by a macroeconomic shock. On the other hand, flexibilisation fosters larger job creation in the expansionary phase of the business cycle of an economy.

As summarised in Glyn et al. (2006), the pro-flexibility literature considers that high levels of protective labour institutions hinder the labour market from adjusting to exogenous shocks. Changes in these institutions can explain unemployment performance over time and across countries. According to the extensive literature devoted to the quantitative impact of labour market institutions on unemployment (Avdagic and Salardi, 2013; Baccaro and Rei, 2007; Baker et al., 2005), the evidence on deregulation's effectiveness in reducing the unemployment rate is weak, not to mention on its negative effect on income inequality (Tridico and Meloni, 2018).

With regard to the evidence on the Spanish case, the significant reduction of employment regulation on both individual and collective dismissals had no direct link to the evolution of employment and unemployment rates (Horwitz and Myant, 2015). Moreover, and prior to the implementation of the labour reforms, Howell and Rehm (2009) conducted a comparative approach and found no positive relationship between unemployment compensation (gross replacement rate) and the unemployment rate. In addition, as Amable and Mayhew (2011) point out, protective labour market institutions (strict employment protection laws and high collective-bargaining coverage) were related to a relatively lower increase in unemployment. Nevertheless, these authors underline that the Spanish case is singular as it combined relatively higher employment protection with rapid growth in unemployment, unlike other countries during the crisis.

Despite the weak evidence on the negative relationship between worker-protective labour laws and unemployment, institutional changes may affect the wage-setting

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mechanism and the functional income distribution. For instance, Deakin et al. (2014) found a positive correlation between employment protection institutions and the labour share.

Our objective is to analyse the effect of wage devaluation on the unemployment rate from a Keynesian approach (Sawyer, 2002; Stockhammer, 2008). To our knowledge, most of the post-crisis Keynesian literature has focused on the impact of fiscal austerity on unemployment and gross domestic product (GDP) (Lopes and do Amaral, 2017), whereas the relationship between wage devaluation and unemployment has received little attention. Spanish supporters of 2010 and 2012 labour market reforms followed the insights of the pro-flexibility perspective. This strand of the literature, usually in a Layard–Nickel framework, considers wages as costs. As a result, the implementation of a wage devaluation strategy fosters unemployment reduction. From a Keynesian point of view, real wages constitute both a production cost and a major source of demand. This implies that wage adjustments may provoke a positive impact on the unemployment rate via its negative effect on aggregate demand.

Following the latter approach, we estimate an extended Bhaduri and Marglin (1990) model with an Okun's law equation. Thus, our model offers the advantage of considering the two-sided role of real wages, the impact of wage restraint on aggregate demand and therefore its impact on unemployment. Depending on the relative size of a change in the labour share on the different aggregate demand components, the demand regime of the economy is wage-led or profit-led.

In order to calculate these effects, we follow a single-equation methodology as it reflects the contribution of each aggregate demand component to GDP growth, whereas simultaneous equation models are more suitable for considering exogenous shocks. This methodology is largely found in the literature (Álvarez et al., 2018; Onaran and Obst, 2016; Storm and Naastepad, 2012).

In addition, numerous studies pointed to capital accumulation having more explanatory power than labour institutions when explaining the unemployment rate (Bande and Karanassou, 2014; Karanassou and Sala, 2014; Rowthorn, 1999; Sala, 2009). Despite these studies' focus on medium-term dynamics, they also stress the role of aggregate demand and, especially, investment in GDP growth.

Our contribution is therefore to clarify the relationships (1) between a change in the output growth threshold for the reduction of unemployment and (2) between wage devaluation and aggregate demand. We show how the structural reforms had a positive impact on the unemployment rate in a wage-led economy like Spain. This is relevant since Spain has frequently been portrayed as a successful case of structural labour reforms (IMF, 2010; MEYSS, 2013; Organisation for Economic Cooperation and Development (OECD), 2014). Essentially, this is because Spain has been one of the countries where the labour share has fallen dramatically but has also reduced its unemployment rate more rapidly (although the latter remains at comparatively very high levels).

The article is organised as follows. The 'Labour market reforms and the wage-setting mechanism' section exposes the main characteristics of labour market reforms and explains the dynamics of wages (Phillips curve). The 'Revisiting Okun's law' section revisits Okun's law to explore the dynamics of wages and unemployment. The section 'Wage devaluation and unemployment during the great recession' introduces our

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theoretical approach and presents our use of the Bhaduri–Marglin model to evaluate the effects of wage devaluation. The final section concludes that flexibilisation significantly reduced wage growth and the labour share, resulting in a contraction of domestic demand and an increase in the short-run unemployment rate.

Labour market reforms and the wage-setting mechanism

Prior to the outbreak of the economic crisis, the Spanish economy was registering increasing external deficits, along with a large accumulation of private debt. Nevertheless, the restrictive macroeconomic policies that were passed to boost the economy and recover from the crisis and the sovereign bond crisis generated new imbalances such as high levels of public deficit and debt, which caused the post-2010 crisis (Cárdenas et al., 2020). After the outbreak of the economic crisis, the diagnosis of domestic and international authorities pointed to the inadequacy of Spanish labour market institutions, as real wages did not fall sufficiently, or fast enough, to prevent the unemployment rate from rising and to restore price-competitiveness (EC, 2012). Following this argument, larger wage flexibility would have prevented the increase in the unemployment rate in case of a severe economic shock (Doménech et al., 2018).

In line with this narrative, the adjustment mechanism during the recession was external, that is, individual or collective dismissals, given the institutional rigidities of the labour market (particularly strong employment protection of open-ended contracts and downwards negotiated wage rigidity). In addition, the adjustment was uneven due to the lack of wage flexibility, as dismissals and wage cuts concentrated on 'outsiders' (Bentolila et al., 2012). Consequently, relatively unprotected workers, with temporary and other non-standard contracts, were affected to a higher extent by the wage adjustment.

The policy conclusion was that higher flexibility reduces labour market dualism and decreases the unemployment rate. Following this prescription, several flexibilisation reforms of the labour market and the industrial relations system were introduced before the crisis hit, particularly between 2008 and 2013. In Spain, the two most important reforms were those of 2010 and 2012, which implied profound changes in labour regulations. Their goal was to reverse the structural weaknesses of the labour market; reduce wage-setting rigidity and labour dualism; and resolve the situation of high unemployment.

The content of these legal changes is well known (Garcia-Serrano and Malo, 2013; Muñoz de Bustillo and Esteve, 2017; Sola et al., 2014). In a nutshell, the 2010 and 2012 reforms facilitated the procedures and lowered the costs of dismissal by reducing employment protection legislation (Cruces et al., 2015). Precisely, the 2012 reform deepened the changes introduced by the 2010 reform and introduced new ones (Horwitz and Myant, 2015).

These reforms deeply facilitated unilateral decisions by employers in collective bargaining, dismissals, work organisation and working conditions (Köhler and Calleja, 2017). As a result, employers' discretionary power increased considerably in terms of external, internal and wage flexibility decisions (López-Andreu, 2018).

Thus, the labour reforms and the Second Employment and Collective Bargaining Agreement (II AENC in Spanish) initiated a wage devaluation process, as illustrated in Figure 1. Indeed, real hourly wages grew by 0.9% annually from the introduction of the

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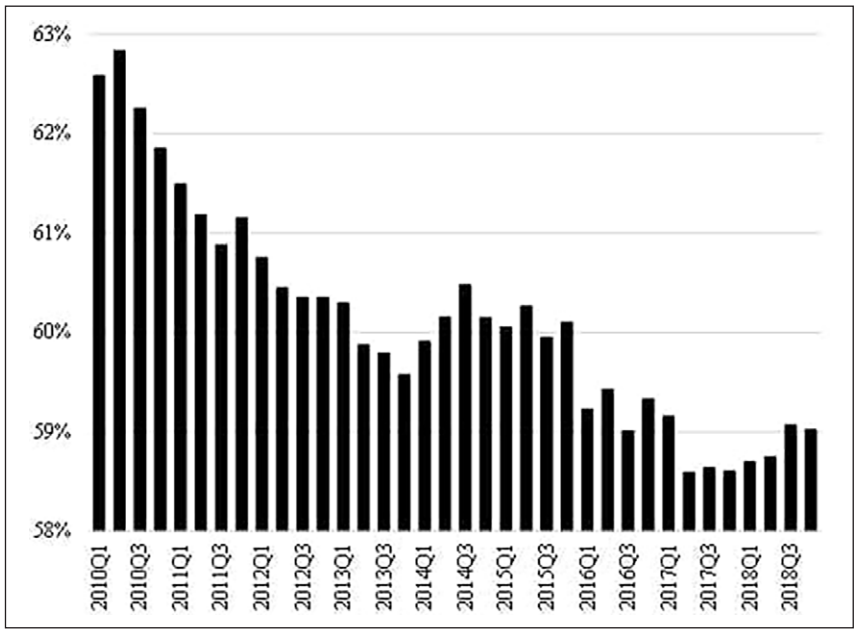

Figure 1. Labour share 2010q1–2018q4.
Source: Quarterly National Accounts.

euro until 2010q1 and fell by –0.1% yearly from the implementation of the first labour market reform until 2018q4.

Social dialogue during the economic crisis was focused on concertation and nominal wage moderation, as established by the Interconfederal Agreement for Collective Bargaining (ANC) initiated in 2002 and extended until the first years of the crisis (2008). Inflation forecasts, productivity growth and wage revisions, including the difference between the variation in the actual consumer price index and the inflation forecast (in order to avoid a price/wage spiral), were considered during the wage-setting negotiations. That is, social dialogue accounted for flexibility mechanisms designed to adapt to the business cycle and macroeconomic shocks, prior to the labour reforms.

The negative relationship between negotiated wages in collective bargaining and the unemployment rate during the economic crisis is depicted in Figure 2. A 1 percentage point (pp) increase in the unemployment rate reduced the negotiated wage by –0.14 pp. This reduction provides evidence of downwards negotiated wage flexibility in the wage-setting mechanism prior to the labour reforms, contrary to the arguments of the proponents of the labour market reforms.

Nevertheless, the labour reforms had a strong impact on the wage-setting mechanism through a modification of the relationship between wages and productivity. Figure 3 evidences an increasing nominal wage and nominal productivity growth gap from 2010q2 onwards, whereas during the early years of the crisis, both variables grew at a similar pace (Álvarez et al., 2018; Cruces et al., 2015).

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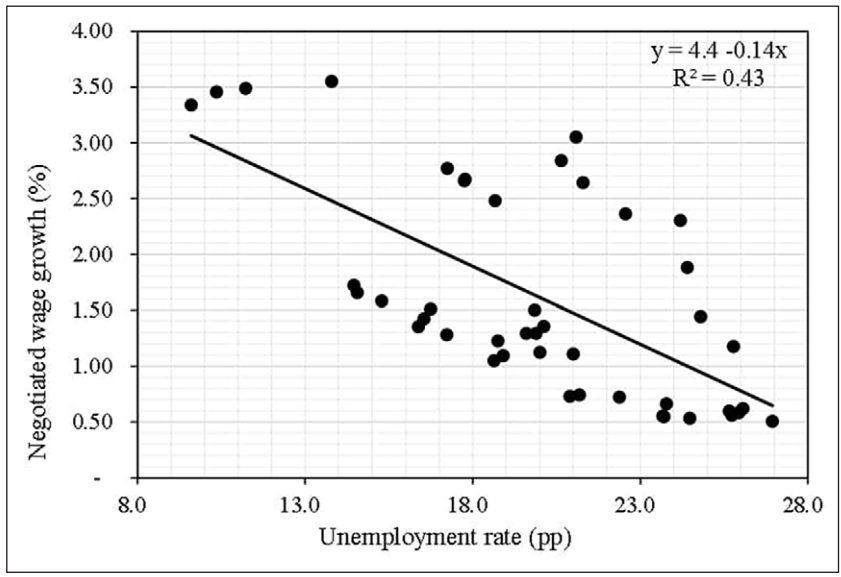

Figure 2. Negotiated wages Phillips curve in Spain (2008–2018).
Source: The negotiated wage is measured as the seasonal growth rate of the (nominal) negotiated wages, this data come from the Spanish Collective Bargaining Agreements Statistics. The monthly unemployment rate is measured as the unemployment registered in the State Employment Public Service over the labour force (number of employees, self-employed and unemployed).

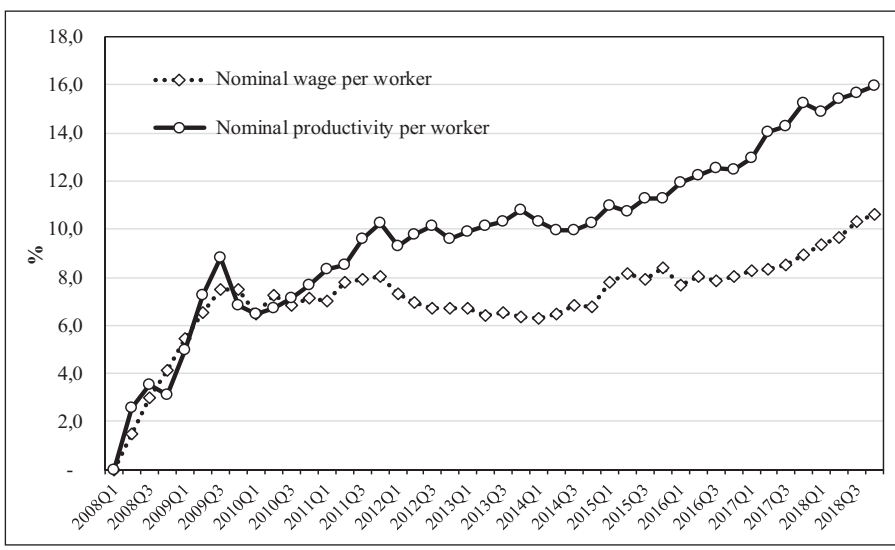

Figure 3. The wage-productivity gap since the economic crisis (cumulative per cent change since 2008q1).
Source: Quarterly National Accounts, National Statistics Institute (INE).

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From 2010q2 (the starting point of the wage devaluation strategy) to 2013q4 (the trough quarter of the business cycle), the labour share decreased by 2.87 pp (see Table 4).

Revisiting Okun's law

The pro-flexibility hypothesis holds that recent labour market reforms modified Okun's law, that is, the relationship between unemployment rate variation and GDP growth rate, so that the post-labour reform Spanish economy requires lower GDP growth rates to reduce its unemployment rate than in the previous expansionary cycle, thanks to the wage moderation strategy and the increased flexibility in the labour market.

This hypothesis is derived from the assumptions of the NAIRU model (Carlin and Soskice, 2005). Accordingly, the institutional aspects of the labour market (such as strict employment protection and hiring laws and high unemployment benefits coverage and intensity) increase workers' bargaining power. As a response, firms are forced to increase their prices in order to protect their margins (profit share) from falling. When the real unemployment rate is below the NAIRU, a process of accelerated inflation reduces demand and increases unemployment, until the NAIRU is reached. Since the labour reforms were aimed at reducing these labour market institutions and shifting the wage bargaining curve, the NAIRU is expected to fall. As a result, the growth threshold above which the unemployment rate is reduced is lower.

The evolution of the Okun's law coefficient in recent years has been increasingly controversial in Spain. On the one hand, Fernandez-Kanz (2016) held that the economic growth threshold for job creation is significantly lower after wage moderation policies. Similarly, Doménech et al. (2018) argued that labour market reforms avoided a larger GDP and employment contraction, which implied a reduction of the output growth threshold for the reduction of unemployment. In addition, Cuerpo et al. (2018) estimated several Okun's law equations, finding that the Spanish economy requires lower GDP growth rates to reduce unemployment or to avoid its increase. However, these scholars found that there is a higher atypical employment elasticity to GDP – in other words, linking the reduction of unemployment to an increase in non-standard jobs.

One the other hand, following a regional approach, Buendía and Sánchez (2017) concluded that the output growth required for employment to grow is lower than the level required to reduce unemployment, thus pointing to the potential role of the labour force participation rate in Okun's law. To tackle this issue, first we decompose the determinants of Okun's law and assess their changes after the labour market reforms; second, we estimate the Okun's coefficient.

First, we use the basic identity proposed by Gordon (2010), decomposing real GDP (Y) into output per hour (Y/H), aggregate hours per worker (H/E), the employment rate (E/L), the labour force participation rate (L/N), and the working-age population (N). This five-component equation in logs can be expressed in terms of change of the unemployment rate, given that $u \approx -\ln(E/L)$, as follows

$$\Delta u = -\Delta \ln(Y) + \Delta \ln(Y/H) + \Delta \ln(H/E) + \Delta \ln(L/N) + \Delta \ln(N) \quad (1)$$

This decomposition is similar to the one provided by Bentolila et al. (2012), but incorporates the evolution of the labour force participation rate and the working-age population.

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Table 1. Evolution of the unemployment rate in Spain (1995–2018).

Period	Phase	Δu	$-\Delta\ln(Y)$	$\Delta\ln(Y/H)$	$\Delta\ln(H/E)$	$\Delta\ln(L/N)$	$\Delta\ln(N)$
1995q1–2008q1	Expansion	–16.8	–47.1	5.0	–6.5	15.0	16.8
2008q2–2013q2	Recession	20.1	10.0	9.5	–1.1	0.5	1.2
2013q2–2018q4	Expansion	–14.6	–14.4	2.1	–0.9	–2.3	0.9

Source: Own elaboration from the Quarterly Spanish National Accounts (update 07/2019) and Economically Active Population Survey (EAPS) (update 08/2019), National Statistics Institute (INE).

Table 1 compares the contribution of each component to unemployment changes over the different phases of the business cycle.

By comparing the unemployment rate in the different business cycle phases, we can appreciate the volatility of unemployment as well as the stronger negative reaction of unemployment to changes in GDP during the recession than during expansions. To be precise, the unemployment rate increased by 20.1 pp in 5 years. Despite the considerable reduction of unemployment during expansionary phases, the unemployment rate has remained rather high since the 1990s. This constitutes a stylised fact of the Spanish labour market (Muñoz de Bustillo and Esteve, 2017).

According to Table 1, the main difference between the expansionary period (1995q1–2008q1) and the recovery period (2013q2–2018q4) is that GDP growth reduced the unemployment rate to a greater extent, which implied a more dynamic response to changes in demand during the recovery period (and after the labour market reforms).

This is explained by the evolution of the remaining components of the equation. Growth in productivity per hour and increases in hours per worker have been limited. The lower the productivity growth, the lower its contribution in reducing the unemployment rate because this effect was not compensated for by a reduction in the hours per worker. It is noteworthy that productivity increased at a higher pace during the recessionary periods than during expansions. This countercyclical behaviour of labour productivity is another stylised fact of the Spanish labour market given its labour intensity. This had the effect that during the economic crisis half of the unemployment increases were due to productivity growth (9.5 pp of 20.1 pp). On the contrary, during the expansion phase, the stagnation of productivity entailed an accelerated unemployment contraction. In this sense, Vergeer and Kleinknecht (2014) held that labour market deregulation slowed down labour productivity growth because in deregulated economies with a labour-intensive organisation like the Spanish one, people work more hours to produce a similar output growth, and therefore reducing unemployment at the expense of productivity growth (Storm and Naastepad, 2017).

Hours per worker only fell by 1 pp, mirroring the weakness of the work-sharing schemes in Spain during the economic crisis, which as noted by Amable and Mayhew (2011) may have long-term impacts due to hysteresis effects. Moreover, there was almost no change in the number of hours per worker in the expansionary phase.

The drastic fall in the labour force participation rate led to a rapid contraction of unemployment since it countervailed the effect of the working-age population increase. It is especially significant that the contraction of the labour force participation rate was

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Table 2. Evolution of the unemployment rate in Spain (1995–2018), accounting for the labour force.

Period	Phase	Δu	$-\Delta\ln(Y/L)$	$\Delta\ln(Y/E)$
1995q1–2008q1	Expansion	−16.8	−15.3	−1.5
2008q1–2013q2	Recession	20.1	11.7	8.4
2013q2–2018q4	Expansion	−14.6	−15.8	1.2

Source: ibid.

larger during the recent expansion than during the economic crisis. During the previous expansionary phase (1995q1–2008q1), the labour force participation rate and the working-age population grew rapidly, slowing down the reduction of the unemployment rate. As a consequence, a larger output growth was required to reduce the unemployment rate.

It follows that in order to analyse GDP growth effects on the evolution of unemployment, it is convenient to control for changes in the labour force, thus avoiding a bias derived from its variations. Indeed, by decomposing the unemployment rate into the ratio GPD/labour force (Y/L) and labour productivity (Y/E), there is no significant difference between the expansionary periods (Table 2).

Okun's law is usually formulated following either the growth rate version or the gap version (Ball et al., 2017). The first establishes a negative relationship between the quarterly real growth rates of GDP and the quarterly change of the unemployment rate. This version is composed of a static formalisation of contemporaneous relations and a dynamic formalisation, captured by the lagged variables. The second version, known as the gap version, employs filter techniques to obtain the trend of both variables, so that the Okun's coefficient can be calculated in terms of differences with respect to their trend (cyclical component). Despite the extensive developments in ways to estimate this empirical regularity, we use the first formulation as it is the most intuitive and appropriate for our aims

$$\Delta U_t = \alpha + \beta Y_t + \omega_t \tag{2a}$$

$$\Delta U_t = \alpha + \beta (Y_t / L) + \omega_t \tag{2b}$$

On the one hand, there is the traditional Okun's law that links GDP growth rates to the variation in percentage points of the unemployment rate (equation (2a)). On the other hand, the modified Okun's law is presented in terms of the growth rate of the ratio GDP/labour force, with the variation of the unemployment rate also in percentage points (equation (2b)). Figure 4 plots both estimates.

The left-hand panel provides evidence in favour of the advocates of the labour reforms, since the grey line for the period after 2012 indicates that the real GDP growth threshold to reduce unemployment in 1 pp has shifted with respect to the previous period. According to the traditional formulation, an increase of almost 3.5% of GDP was necessary to reduce the unemployment rate in 1 pp during the period 1995–2012, whereas in the second period (2013–2018) the GDP growth threshold was 1.2%.

The right-hand panel, where real GDP has been modified to account for changes in labour force size, does not point to a change in the threshold. According to the modified

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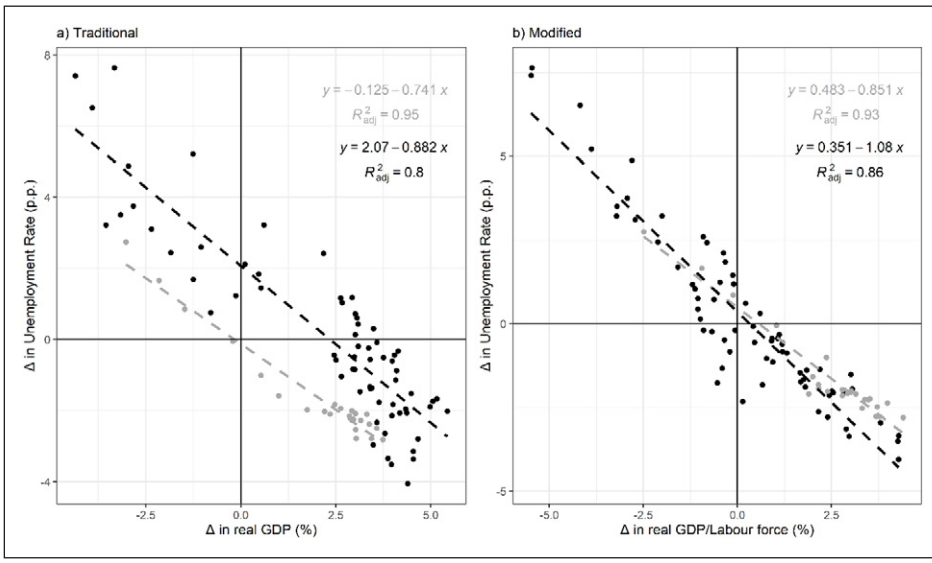

Figure 4. How has the unemployment/GDP relationship changed after labour market reforms (2010–2012)?
Note: The period is 1995q1–2018q4, data after 2012 are plotted in grey.
Source: Own elaboration from the Quarterly Spanish National Accounts (QSNA) (update 07/2019) and Economically Active Population Survey (EAPS) (update 08/2019), National Statistics Institute (INE).

equation, the growth of real GDP adjusted by the labour force necessary to reduce 1 pp of the unemployment rate was 1.25% during the period 1995–2012. After the labour markets reforms (2013–2018), the GDP/Labour force threshold to reduce 1 pp of the unemployment rate rises to 1.74%. This illustrates that when controlling for the labour force, the real GDP growth threshold to reduce unemployment does not vary in the recovery period.

In accordance with these results, we may argue that in order not to overestimate the effect that the institutional changes have on the reduction of unemployment it is necessary to incorporate in the analysis the evolution of the labour force. This evidence suggests that after 2012, job destruction was similar to the previous crisis and the reduction of the unemployment rate was analogous (or even lower) in the expansionary phase, contrary to the narrative of the labour market proponents.

Indeed, employment recovers rapidly during the 2013–2018 period due to the labour-intensive idiosyncrasy of the Spanish economy, which is mirrored in the stagnation of labour productivity growth, and as a result of the fall in the labour force participation ratio. This cast serious doubts about the usefulness of labour market reforms to achieve a higher employment rate, as the pro-flexibility policy claims.

Second, we estimate the Okun's coefficient following the methodology proposed by Hartwig (2014) and IMF (2010), yet we introduce the labour force (L), as the previous evidence suggests this variable explains the variations of the unemployment rate. We formulate the following equation[1]

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$$logU_t = u_o + \beta_{yt} logY_t + \sum_{i=1}^{n} \beta_{yi} logY_{t-i} + \beta_{lat} logL_t + \sum_{i=1}^{n} \beta_{lai} logL_{t-i} + \sum_{i=1}^{n} \beta_{ui} logU_{t-i} \quad (3)$$

U_t denotes the unemployment rate and Y_t denotes real GDP. β_{yt} captures the contemporaneous effect – or short-run effect – of 1 pp in real GDP on the unemployment rate. The long-run effect or dynamic effect β^* is given by equation (4). The estimation results are reported in Table 3 and will be used in the section headed '*The effects of the growth of the labour share on the unemployment rate*'.

$$\beta^* = \frac{\beta_{yt} + \sum_{i=1}^{n} \beta_{yi}}{1 - \sum_{i=1}^{n} \beta_{ui}} = \frac{-0.472}{(1 - 0.354)} = -0.73 \quad (4)$$

Basing on Quarterly National Accounts data, we calculate the difference of the logarithms of the variables in equation (3), except for the unemployment rate. We run the cumulative sum test for parameter stability to check for the presence of a structural break after the labour market reforms. The presence of a structural break would imply a change in Okun's coefficient, as the labour market reform advocates hold. According to the CUSUM test, we cannot reject the null hypothesis of no structural break (see Table 3).

These results reinforce the presented evidence and cast serious doubts about the usefulness of labour market reforms to achieve a higher employment rate, as the pro-flexibility policy claims.

Wage devaluation and unemployment during the great recession

For the purpose of analysing the macroeconomic implications of wage devaluation on aggregate demand and unemployment, we use the Bhaduri–Marglin model as our theoretical framework. This Kaleckian model is frequently used to determine the demand regime of an economy, which could be wage-led or profit-led. In the former, a labour share increase drives up GDP because the propensity to consume out of wages is higher than that out of profits and the acceleration effect (investment elasticity to GDP) is higher than profitability effect (investment elasticity to profit share). In the latter, an increase in the profit share boosts investment thanks to a strong profitability effect.

An extended Bhaduri–Marglin model with labour market for the Spanish economy

There are previous Bhaduri–Marglin estimations for the Spanish economy, the most relevant being Naastepad and Storm (2006), Storm and Naastepad (2012), Onaran and Obst (2016), Álvarez et al. (2018) and Villanueva et al. (2020). All of them find the demand regime in Spain to be wage-led. Nonetheless, our purpose is to use the estimation results

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to measure the effect of the wage devaluation on unemployment. Our Bhaduri–Marglin model consists of a set of equations in which changes in the labour share affect different components of private aggregate demand, following the structural or single-equation approach proposed in Álvarez et al. (2018). As the fall in the labour share during the wage devaluation period has been directly attributed to the labour market reforms (as seen in Figure 2), income distribution is assumed to be exogenous. Critics of this approach as opposed to the aggregative approach have argued that this assumption leads to a simultaneity bias. Nevertheless, by estimating a generalised method of moments estimation for the US to correct for such a bias, Blecker et al. (2020) find similar results to an ordinary least squares estimation. Given that we included the unemployment rate in our model, the exogeneity of the labour share implies no dynamic interactions between the demand regime and the unemployment effect on income distribution, as a Goodwin-type model would.

Changes in the labour share directly affect household consumption, as the propensity to consume out of wages is usually higher than the same propensity out of profits. Private investment is also affected directly by these changes as this variable is sensible to the profit rate (which includes the profit share). On the contrary, net exports are affected indirectly through changes in domestic or export prices via unit labour costs (trade competitiveness).

In this section, we follow the single-equation estimation procedure to obtain the value of all the elasticities that determine the total effect of 1 pp increase of the labour share on private consumption, private investment and net exports, and therefore on private aggregate demand.

We use quarterly data from Eurostat, the OECD and the Ministry of Economy and Business from 1995q1 until 2018q4. We transformed all variables into logarithms, except for the nominal long-term interest rates and the unemployment rate. Hence, the estimated coefficients are elasticities. In addition, all variables are expressed in real terms. After performing the augmented Dickey–Fuller test, we differentiated the integrated variables.[2] Long-term interest rates, the profit share and the unemployment rate do not have a unit root.

We have included as explanatory variables both the contemporaneous value and the first lag of the variables, keeping finally those that were statistically significant. Autocorrelation has been corrected through the Cochrane-Orcutt transformation (Villanueva et al., 2020) when the autoregressive term is AR(1). We have estimated the following six equations

$$logC = c_o + c_w logW + c_r logR + c_{dh} logDh \tag{5}$$

$$logI = i_o + i_y logY + i_\pi log\pi + i_r r + i_{dh} logDh \tag{6}$$

$$logX = x_o + x_{y*} logY^* + x_{reer37} logREER37 \tag{7}$$

$$logM = m_o + m_y logY + m_{ppm} logPPM \tag{8}$$

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$$logP = p_o + p_{ulc} logULC + p_{pm} logPM + p_U U \quad (9)$$

$$logPX = px_o + px_{ulc} logULC + px_{pm} logPM \quad (10)$$

First, equations (5) and (6) measure the extent to which consumption and investment are affected by changes in functional distribution. Household consumption (*C*) growth is determined by adjusted employee compensation (*W*)[3] and the adjusted operating surplus (*R*), as in the traditional Bhaduri–Marglin model. In addition, we include household debt (*Dh*) as a control variable, following Onaran et al. (2011), Stockhammer and Wildauer (2016), Onaran and Obst (2016) and Álvarez et al. (2018).

Private gross fixed capital formation (*I*) growth is determined by real GDP (*Y*), profit share (π) and nominal long-term interest rates (*r*). National income proxies expected demand, which is the main determinant of gross fixed capital formation in OECD and Eurozone countries (Álvarez et al., 2018). The profit share is introduced as a proxy for profitability. Nominal long-term interest rates should have a negative sign because they contain the financial cost of the investment (Hein and Ochsen, 2003). Likewise, household debt (*Dh*) has been included as a proxy of financial markets.

Equation (7) estimates the effects of foreign demand (total GDP of OECD countries, *Y**) and price variables (relative effective exchange rate vis-à-vis 37 industrialised economies calculated using export prices, *REER37*)[4] on gross exports (*X*). Accordingly, this equation considers that exports of a country depend positively on the income level of the rest of the world – which is an exogenous variable – and negatively on the relative export price vis-à-vis its competitors. In addition, equation (8) shows the effects of domestic demand and price variables (the ratio of domestic prices over import prices, *PPM*) on gross imports (*M*). We expect the first factor to have a larger relevance, because of the high income elasticity of imports observed in the Spanish case.

In addition, the last two equations show how changes in unit labour costs (*ULC*) and import prices (*pm*) influences domestic prices (GDP deflator, *p*) and export prices (*px*). Equation (9) represents a price Phillips curve, where the GDP deflator (*P*) is a function of unit labour costs and import prices (*PM*) and the unemployment rate (*U*). We include the latter variable in order to control the effect of the unemployment rate fluctuations on prices because, as we have pointed previously, it is very volatile. The p_{ulc} coefficient represents to what extent changes in unit labour costs are transferred to domestic prices. Furthermore, equation (10) estimates export prices as a function of both unit labour costs (*ULC*) and import prices (*PM*). Similarly, px_{ulc} shows the link between changes in ULC and changes in export prices. The other explanatory variable implies that the export prices could be influenced by import prices; predictably, this elasticity will show a positive sign.

Table 3 summarises the obtained results; the total effect of wage devaluation on the unemployment rate will be calculated in the following section.

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Table 3. Estimation results (1995q1–2018q4).

	Unemployment	Consumption	Investment	Exports	Imports	Prices	Export prices
	(3)	(5)	(6)	(7)	(8)	(9)	(10)
$dlogY_t$	–0.472***		3.193***		2.433***		
	(0.0807)		(0.710)		(0.561)		
$dloghodebt_t$		0.166*	1.252**				
		(0.0761)	(0.374)				
$dlogW_t$		0.369***					
		(0.0819)					
$dlogYW_t$				2.855***			
				(0.176)			
$dlogREER37t\text{-}_2$				–0.390~			
				(0.202)			
$dlogPPM_{t\text{-}1}$					0.372*		
					(0.143)		
$dlogULC_t$						0.139**	
						(0.0453)	
U_t						–0.0219***	
						(0.00392)	
$dlogPM_t$							0.434***
							(0.0339)
$dlogL_t$	0.300***						
	(0.0549)						

(Continued)

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Table 3. (Continued)

	Unemployment	Consumption	Investment	Exports	Imports	Prices	Export prices
	(3)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.0867~	0.00397	–0.340**	–0.0171**	–0.0109	0.0844***	0.0180**
	(0.0483)	(0.00719)	(0.121)	(0.00540)	(0.0220)	(0.0109)	(0.00535)
trend			0.00390*				–0.000186*
			(0.00165)				(8.80e-05)
time dummies	1.199***	–0.0131***	0.0386***		–0.110***	–0.0119***	0.0164~
	(0.228)	(0.00254)	(0.0103)		(0.0222)	(0.00227)	(0.00930)
Observations	94	77	76	90	91	92	93
R^2	0.822	0.450	0.540	0.606	0.534	0.666	0.686
Adj. R^2	0.814	0.428	0.514	0.597	0.518	0.654	0.675
p-value F test	0.000190	0.00897	0.0136	0.00757	0.00569	0.00307	0.00295
Durbin Watson statistic	1780	1.663	2.239	1.889	1.753	2.043	1.922
Shapiro normality test p-value	0.478	0.400	0.120	0.372	0.744	0.192	0.398
Log likelihood	–12.82	275.8	170.5	227.2	206.2	387.9	321.1
AIC	35.64	–543.6	–330.9	–448.4	–404.3	–767.8	–634.3
BIC	48.35	–534.3	–319.3	–440.9	–394.3	–757.7	–624.1
Rho/AR(1)	0.354	0.879	0.918	0.620	0.833	0.690	0.661

AIC: Akaike information criterion; BIC: Bayesian information criterion; AR: autoregressive.
Standard errors in parentheses.
~ $p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$.

The effects of the growth of the labour share on the unemployment rate

First, we calculate the effect of a change in the labour share on consumption (equation (11)).Using equation (5), dividing by GDP (Y) and deriving, we have the elasticity of consumption relative to the labour share, whose value can be obtained from Table 2. According to our results, the propensity to consume out of profits is not statistically significant. This goes in line with the results found in Álvarez et al. (2018) but differs from those in Onaran and Obst (2016). In addition, household debt (Dh) has the expected sign because credit can be a source of disposable income and hence drives consumption up

$$\frac{\Delta C/Y}{\Delta\Omega} = \left(c_w * \frac{Y}{W} * \frac{C}{Y} - c_r * \frac{Y}{R} * \frac{C}{Y} \right) = (\beta_W - \beta_R) * \frac{C}{Y} \tag{11}$$

$$\frac{\Delta I/Y}{\Delta\Omega} = \left(-i_\pi * \frac{I}{R} \right) + \left[\frac{\Delta Y/Y}{\Delta\Omega} \right] * i_y \frac{I}{Y} \tag{12}$$

$$\frac{\Delta XN/Y}{\Delta\Omega} = \frac{\Delta X/Y}{\Delta\Omega} - \frac{\Delta M/Y}{\Delta\Omega} \tag{13}$$

$$[(\Delta X / Y) / \Delta\Omega]_{X\,comp} = \varepsilon_\Omega^X * X / Y * 1/\Omega = (\varepsilon_\Omega^{ULC} * \varepsilon_{ULC}^{PX} * \varepsilon_{PX}^X) * X / Y * 1/\Omega \tag{14a}$$

$$[(\Delta M / Y) / \Delta\Omega]_{M\,sust} = \varepsilon_\Omega^M * M / Y * 1/\Omega = (\varepsilon_\Omega^{ULC} * \varepsilon_{ULC}^P * \varepsilon_P^M) * M / Y * 1/\Omega \tag{14b}$$

$$[\Delta U / \Delta\Omega] = [(\Delta Y / Y) / \Delta\Omega] * [\Delta U / (\Delta Y / Y)] = [(\Delta Y / Y) / \Delta\Omega] * \beta^* \tag{15}$$

Second, there are two effects of a change in the labour share on investment (equation (12)). On one side, the ex-ante (or direct) effect consists of the investment profit share elasticity (with a negative sign) multiplied by the reinvestment rate. Thus, even though the profit share could theoretically increase investment under a scenario of a low reinvestment rate the stimuli effect would be small.

On the other side, the ex-post (or indirect) effect reflects the change in investment driven by the accelerator effect. To calculate it, the investment income elasticity is weighted by the investment share (investment over GDP ratio) and multiplied by the ex-ante effects of each component of aggregate demand. In this case, we include the positive impact of consumption and the negative impact of net exports. The total effect on investment will depend on the ex-ante and ex-post effects. If the ex-ante effect was higher than the ex-post effect, the investment would be profit-led even if aggregate demand were wage-led.

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In our case, the direct profitability effect is not statistically significant; the same happens when alternative lag structures and specifications are tested. Therefore, investment is also wage-led as we find a strong positive relationship between income and private investment, hinting to a strong accelerator.

Although some previous papers have found a positive impact of the profit share on investment (Storm and Naastepad, 2012), we believe this might be due to the period used (1964–2000). There is another significant variable – household debt – which could play a determinant role in the high residential investment during the period 1995–2007. Long-term interest rates do not show a statistically significant relationship with investment.

The marginal effect of net exports on GDP (equation (13)) depends on the impact of the labour share on exports (equation (14a)) and imports (equation 14b)). In the first case, the main channel is the 'price-competitiveness of exports': if an increase of the labour share boosts unit labour costs, then the price of exports (*PX*) increases too. This price-competitiveness loss could imply a fall in gross exports. Thus, being ε_B^A the elasticity of variable A with respect to variable B, we should estimate the relation between Ω and *ULC* (ε_Ω^{ULC}); the elasticity of export prices relative to labour costs (ε_{ULC}^{PX}); and the elasticity of exports with respect to export prices (ε_{PX}^{X}).

In the second case, if the increase in unit labour costs is transferred into domestic prices (P), this could foster a process of substitution of domestic production by imports, depending on the price elasticity of imports. Nevertheless, we have found that a 1% growth in ULC is only translated in a 0.14% growth in prices. For this reason, unit labour costs are not significantly transferred into export prices: a reduction in unit labour costs, and hence in the labour share, does not imply a price-competitiveness gain (see Table 5 in Appendix 1).

Table 4 reports the total marginal effects of each aggregate demand component on GDP and the unemployment rate. As the profit share does not significantly affect investment, the effect reported below captures the indirect effect on investment driven by changes in functional income.

All in all, the marginal effect of 1 pp increase in the labour share on aggregate demand (0.62 pp), when the multiplier is taken into account, amounts to a positive impact of 0.91%. Once the effect of the labour share on GDP [(ΔY/Y)/ΔΩ] and that of GDP on unemployment (β^*) have been calculated (the Okun's law coefficient), we estimate the direct effect of wage devaluation on unemployment during the recession. During the period 2010q2–2013q4, the unemployment rate increased by 5.84 pp, whereas the labour share decreased by –2.87 pp. According to our estimations, a fall in GDP by –2.61 pp, derived from wage devaluation, lifted the unemployment rate by 1.9 pp. This means that 32.6% of the unemployment rate increment between 2010q2 and 2013q4 occurred directly as a consequence of wage devaluation. Contrary to the claims of the pro-flexibility literature, this evidence points to a negative effect of labour market reforms in the unemployment rate.

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Table 4. Labour share effect on GDP and Unemployment (2010q2–2013q4).

	Elasticities	Ratio	Marginal effect	Multiplier	Effect 1 pp	Labour share	Total effect on GDP	Okun coefficient	ΔUnemployment rate
	(a)	(b)	(c) = (a) × (b)	μ	(d) = (c) × μ	ΔΩ	(e) = (d) × ΔΩ	β	f = (e) × β
(1) Consumption	0.37	1.15	0.43	1.46	0.62	–2.87	–1.78	–0.73	1.30
(2) Investment	3.19	0.17	0.22	1.46	0.32	–2.87	–0.93	–0.73	0.68
(3) Net exports			–0.03	1.46	–0.04	–2.87	0.10	–0.73	–0.08
(4) = (1) + (2) + (3)			0.62	1.46	0.91	–2.87	**–2.61**	–0.73	**1.90**

Source: Author's own calculations, based on Eurostat quarterly data.
GDP: gross domestic product.

Finally, as discussed in the 'Revisiting Okun's law' section, the evolution of the labour force during the recession had an effect on the unemployment rate. Given the fall of the labour force by 0.4% during that period and the labour force elasticity of the unemployment rate derived from Table 3[5] the evolution of the labour force partially compensated for the increase of the unemployment rate by –0.2 pp.

Conclusion

Labour policy and unemployment have traditionally been controversial in Spain. The pro-flexibility labour market reforms of 2010 and 2012 were aimed to reduce the high unemployment rate provoked by the economic and financial crisis after 2008.

The advocates of these structural reforms held that legal changes prevented a greater job destruction in the recession and facilitated a larger reduction in unemployment for similar GDP growth rates in expansion. Nevertheless, the evidence in the 'Revisiting Okun's law' section suggests no significant modification in Okun's law when the evolution of the labour force is taken into account.

Then, the main result of these reforms was a wage devaluation process, which is mirrored in the fall of the labour share during several years (2010q2–2013q4). From a mainstream perspective, there is a wage/employment trade-off in the Spanish economy and therefore unemployment falls, thanks to the wage moderation process. However, in a wage-led economy like Spain (Álvarez et al., 2018), a reduction in the labour share translates into a contraction of GDP as well as a higher unemployment rate, given the high Okun's law coefficient.

Consequently, wage devaluation has hampered both GDP growth and unemployment reduction. According to our estimation results of an extended version of the single-equations Bhaduri–Marglin model with quarterly data from 1995q1 until 2018q4, the unemployment rate increased by 1.9 pp as a consequence of the contraction of 2.87 pp in the labour share. This implies that 32.6%[6] of the unemployment increase was a direct consequence of wage devaluation. The main mechanisms through which the fall in the labour share shrank aggregate demand were the strong restriction of private consumption and investment, along with the weak impact on net exports.

Two main limitations of our study should encourage future research. First, when considering the labour share to be exogenous, we implicitly neglect the feedback effect on the labour share and GDP driven by the increase in unemployment. This assumption might underestimate the effect of wage devaluation (Blecker et al., 2020). Second, wage devaluation effects on capital accumulation and hysteresis have not been considered and might be at the root of higher unemployment rates in the medium-term.

Notwithstanding these two potential limitations, our findings indicate that Spain constitutes a good case study for providing evidence on the effectiveness of flexibilisation and deregulation. The reforms modified the wage-setting mechanism and drastically reduced wage growth and the labour share, thus leading to a contraction of domestic demand and an increase in the unemployment rate in the short-run.

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Notes

1. Note that real gross domestic product (GDP) and the labour force enter equation (3) separately for the purpose of calculating the marginal effect in the section headed '*The effects of the growth of the labour share on the unemployment rate*'.
2. The lag structure has been chosen following Schwert (1989).
3. Wages have been adjusted by multiplying real compensation of employees by employment and dividing it by the number of employees. This transformation is used to account for the remuneration of the self-employed. The operating surplus has been adjusted accordingly.
4. This aggregate of industrialised economies includes: EU28, Australia, Canada, Japan, Mexico, New Zealand, Norway, Switzerland, Turkey and USA.
5. This elasticity is calculated following equation (4) 0.300/(1-0.354)=0.46.
6. Other factors that contracted aggregate demand, such as the collapse of the real estate bubble and the construction sector or austerity policies, can explain the remainder of the increase.

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Appendix 1

Table 5. Marginal effect of a 1 pp decrease in the labour share (Ω) on net exports at mean values from 2010q2 to 2013q4.

Price-competitiveness effect								Total
	$\varepsilon_{\Omega}^{ulc}$	ε_{ulc}^{px}	ε_{px}^{X}	ε_{Ω}^{X}	1/Ω	X/Y		(ΔNX/Y)/ΔΩ
Exports	1.16	n.s.	–0.39	n.s.	1.59	0.26	n.s.	n.s.
Import substitution effect								
	$\varepsilon_{\Omega}^{ulc}$	ε_{ulc}^{p}	ε_{p}^{M}	ε_{Ω}^{M}	1/Ω	M/Y		
Imports	1.16	0.139	0.37	0.06	1.59	0.26	0.03	0.03
Net exports							**–0.03**	**–0.03**

Source: Authors' own calculations, based on Eurostat quarterly data.

Table 6. Demand multiplier.

	Elasticities	Ratio to GDP	Marginal effect	Multiplier
	(a)	(b)	(c) = (a)*(b)	μ
(1) Consumption	0.37	0.83	0.31	
(2) Investment	3.19	0.20	0.65	
(3) Imports	–2.43	0.26	–0.64	
(4) Multiplier			0.31	1.46

Source: Author's own calculations, based on Eurostat quarterly data.
GDP: gross domestic product.

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