The loopholes of labour market reforms: links between wage devaluation and unemployment

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This paper analyses the effect of wage devaluation on the Spanish labour market during the Great Recession. According to the pro-flexibility literature, labour market reforms and wage devaluation policies prevented the Spanish economy from larger job destruction in the recession and a larger reduction in unemployment for similar GDP growth rates during expansion, i.e. shifting the Okun's curve. To contrast this hypothesis, we consider distributive variables as well as possible changes in the Okun's curve and estimate an extended version of the single-equations Bhaduri-Marglin model with quarterly data from 1995q1 until 2018q4. According to our results, first, wage devaluation has not significantly shifted the Okun's curve, and second, it has increased the unemployment rate in 1.64pp. In other words, 28% of the unemployment rate increase during the Great Recession can be attributed to wage devaluation. Our contribution is, therefore, to reject the above-mentioned hypothesis and show how the structural reforms, particularly in Spain, had a harmful impact on the unemployment rate and in the recovery.

Keywords: Wage devaluation, Bhaduri-Marglin, Spanish economy, Labour market

JEL classification: C22, E11, E24

1. 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 & Baccaro, 2012), in order to correct macroeconomic imbalances. Then, the fundamental aim of the 2010 and 2012 Spanish labor reforms was to increase flexibility in order to improve the labour market performance. These structural reforms of the labour market had three main lines of action. Firstly, measures to end labour market dualism through a reduction of employment protection of open-ended contracts. Secondly, measures to decentralize collective bargaining and adapt it to the particular conditions of firms and employers. Thirdly, measures to encourage the use of internal flexibility tools by enterprises reducing restrictions to employers for modifying work conditions. In combination with other programs, this package of deregulation policies decreased the coverage of labour protection (Picot and Tassinari, 2017).

According to the advocates of flexibilization (MEYSS, 2013), the institutional change in the employment and industrial relations systems has a twofold impact as a result of wage moderation and more employment flexibility. On the one side, it prevents larger job destruction during the recession period, generally provoked by a macroeconomic shock. Likewise, on the other side, flexibilization fosters larger job creation in the expansionary phase of the business cycle.

As summarized in Glyn, Howell & Schmitt (2006) the pro-flexibility literature considers that high levels of protective labour institutions restrict the ability of the labour market to adjust to exogenous shocks and those changes in these institutions can explain unemployment performance over time and across countries. However, the evidence on deregulation's effectiveness in reducing unemployment rate is weak, as shows the extensive literature devoted to the quantitative impact of labour market institutions on unemployment (Baker, Glyn, Howell & Schmitt, 2005; Baccaro and Rei, 2007; Vergeer and Kleinknecht, 2012; Avdagic and Salardi, 2013).

In the case of Spain, there was a significative reduction of employment regulation on individual and collective dismissals but there was no direct link with the evolution of the employment and the unemployment rate (Horwitz & Myant, 2015). Similarly, Howell and Rehm (2009) hold that there is no previous evidence about a positive relationship between unemployment compensation (gross replacement rate) and the unemployment rate in the case of Spain. 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, the Spanish case is particular as it combined a relatively higher employment protection with rapid growth in unemployment, unlike other countries during the crisis.

Despite the evidence that a negative relationship between worker-protective labour laws and unemployment is weak, Deakin, Malmberg & Sarkar (2014) find that there is a positive correlation between employment protection institutions and the labour share. Consequently, it is relevant to analyses the impact on the labour share of the pro-flexibility labour market reforms.

Consequently, our objective is to research the effect of wage devaluation on the unemployment rate from a Keynesian approach (Stockhammer, 2011), wherefore we estimate an extended Bhaduri-Marglin model with an Okun's law equation. This model offers the advantage of considering the two-side character of real wages, as a production cost but also as a major source of demand (Bhaduri and Marglin 1990). Pro-flexibility literature has traditionally considered wages as costs in a Layard-Nickel framework. We believe, it is relevant to include the impact of wage restraint on aggregate demand — particularly on consumption, investment and net exports — and therefore on unemployment.

In order to calculate these effects, we follow a single equation methodology because simultaneous equation models collect exogenous shocks but do not satisfactorily reflect the contribution of each aggregate demand component to GDP growth. Henceforth, for the objective of our research, the estimation of single equation model provides a better approximation, and it is in line with a large share of the literature (Naastepad and Storm, 2006, Hein and Tarassow, 2009, Storm and Naastepad, 2012, Onaran and Obst, 2016, Álvarez, Uxó and Febrero, 2017).

Additionally, a relevant number of studies have pointed to capital accumulation as a key factor in order to explain the unemployment rate (Rowthorn, 1995; Stockhammer and Klär, 2010), which has a larger weight than labour institutions in the case of Spain (Sala, 2009, Karanassou and Sala, 2014; Bande and Karanassou, 2014). Even though these studies are focused on medium-term dynamics, they are compatible with our methodology as they underline the role of aggregate demand and, especially, investment.

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

The paper is organized as follows. The second section exposes the main characteristics of labour market reforms and explains the dynamics of wages (Phillip's curve) and unemployment (Okun's law). Section 3 introduces our theoretical approach and presents our use of the Bhaduri-Marglin model to evaluate the effect of wage devaluation. The final section summarizes our conclusions obtained from the analysis.

2. Labour market reforms, wages, and unemployment

After the outbreak of the economic crisis, the diagnosis of domestic and international authorities was that the Spanish labour market institutions were strongly inadequate and, as a result, real wages did not fall sufficiently, or fast enough, to prevent an increase in the unemployment rate. Following this argument, larger wage flexibility would have prevented severe economic shock and the increase in the unemployment rate (Doménech, García & Ulloa, 2018)

This narrative holds that, as a consequence of the institutional rigidities of the labour market, the adjustment mechanism during the recession was external i.e. individual or collective dismissal. In addition, the adjustment was uneven due to the lack of wage flexibility, thus dismissals and wage cuts concentrated on the secondary segment of the labour market (Bentolila, Dolado, and Jimeno, 2012). Consequently, the relatively unprotected workers, who have temporary and other nonstandard contracts (mainly young workers and women), suffered to a higher extent the wage adjustment.

The policy implication is that higher flexibility reduces labour market dualism and decreases the unemployment rate. Following this prescription, during 2008-2013, there have been several reforms flexibilization of the labour market and the industrial relations system (Picot and Tassinari, 2017). The two most important were those of 2010 and 2012, which introduced profound changes in labour regulations, in order to reverse the structural weaknesses of the Spanish labour market, reduce wage-setting rigidity and labour dualism and resolve the situation of high unemployment. Despite the political sign of the Party that introduced the reform, both were unilaterally imposed by the Government via a decree-law, breaking therefore the social dialogue (Molina and Miguélez, 2013)[1].

The content of these legal changes under austerity is well known (Garcia-Serrano and Malo, 2013; Sola et al, 2014, Muñoz de Bustillo and Esteve, 2017). In a nutshell, the 2010 reform facilitated the procedures and lowered the costs of dismissal (Cruces et al., 2015). The 2012 reform went much further, significantly reducing employment protection legislation (dismissal costs and procedures). In addition, there is a clear line of continuity between them, as the 2012 reform deepens those changes introduced by the 2010 reform and introduced new ones (Horwitz and Myant, 2015).

The change in the employment relations system driven by these reforms was threefold. Firstly, employment protection was reduced through the cutback of the dismissal costs of open-ended contracts (external flexibility). The compensation for unfair dismissal was reduced from 45 to 33 days of gross wage per year worked, and the maximum from 42 to 24 monthly payments. This was very relevant because Spanish companies frequently use unjustified or unfairly dismissal. Additionally, the conditions for fair lay off based on economic grounds were extended, so that a company facing or foreseeing losses (or income reduction) could reduce the compensation to 20 days per year of service and 12 monthly payments. In addition, the authorization for collective dismissals was eliminated as well as the agreement between the company and employee representatives. These legal changes aimed to reduce the employment protection gap between open-ended and fixed-term contracts, which was underlined as the main cause of the poor performance of the Spanish labour market (Bentolila, Cahuc, Dolado, and Le Barbanchon, 2012).

Secondly, measures to encourage open-ended contracts and to reduce entry-barriers were included. The severance payments for temporary contracts increased from eight to 12 days per year and temporary contracts can be renewed up to a duration 24 months (before it was 30 months) in the same company or group of companies. Further, new modalities of open-ended hiring were created, with reduced dismissal cost, (longer) trial period of

[1] 2010 reform was approved by a social-democratic government (Spanish Socialist Party) and the 2012 reform by a right-wing government (Popular Party),

one year and offer several tax incentives. Subsidies on Social Security contributions for transforming nonstandard contracts, like replacement and internship contracts, into open-ended contracts were passed as well.

Thirdly, in order to promote internal flexibility, the labour reforms allowed companies to modify unilaterally working conditions (wages, working hours, working time, geographical mobility, among others); specifically, the flexibility in part-time work was significantly increased. Complementarily, employers may implement suspensions of contracts and temporary reductions of working hours without administrative authorization and with public financial support, in case of economic, organizational or technical causes.

The main changes in the industrial relation and collective bargaining system in the direction of increase wage flexibility were the following. First, the opting out of the conditions at a high level (sectoral, national or regional) collective agreement is allowed unilaterally by the company, when it is economic (actual or foreseen losses or income reductions), technical, organizational or production problems. Second, company-level collective agreements have priority over high-level agreements. Hence, sectoral collective agreements, which had been the pillar of the Spanish collective bargaining system, can be modified at the company level. Third, the 2012 reform critically limited the automatic extension of collective agreements to only one year, after which workers would be covered by a higher-level agreement or by no collective agreement at all.

All in all, these reforms deeply facilitated unilateral decisions by employers as well as in collective bargaining as in dismissal, work organization and working conditions (Köhler and Calleja, 2017). As a result, the discretionary power of the employers was increased considerably in order to increase external, internal and wage flexibility (López-Andreu, 2018).

Thus, labour reform and the Second Employment and Collective Bargaining Agreement (II AENC in Spanish) brought a wage moderation process. Subsequently, the Ministry of Employment and Social Security holds: "*the reform would have helped prevent the destruction of 225,800 jobs" (MEYSS, 2013:13).* Besides: *"the Spanish economy will be capable of generating jobs with a growth rate of between 1% and 1.2%, significantly below the figure before the reform, which was above 2%" (MEYSS, 2013:14).* Finally, *"The moderation in the rate of job destruction is linked to [wage moderation]" (MEYSS, 2013:78).*

Concisely, these features constitute the hypotheses that we will test:

- First hypothesis (H.1): labour reforms prevented a greater job destruction in the recession (H1.1) and facilitated a larger reduction in unemployment for similar GDP growth rates in the expansion (H1.2).

- Second hypothesis (H.2): wage devaluation decreased the labour share, which reduced unemployment reduction since there is a wage/unemployment trade-off in the Spanish economy.

In the following two subsections, we analyse the rigidity of the wage-setting mechanism before the labour market reforms and how it changed since then. Furthermore, the evolution of the Okun's law is also analysed in order to confirm whether the hypotheses of pro-flexibility literature are confirmed.

2.1. Was wage-setting really rigid? The path of wage devaluation

Despite the narrative about the institutional constraints of the labour market, there are serious doubts that rising unemployment is due to wage rigidity. In the first place, most of the job destruction from 2008 to 2013 was due to the Spanish growth model (Buendía, 2018) and the weight of the real estate and construction sector during the economic and financial crisis. In this sense, Uxó, Febrero and Bermejo (2016, p.142) hold that, directly and indirectly, job destruction in these sectors explains 77% of the total job destruction during the period 2007-11 and 47,5% in the 2011-14 period. Given that the variation of negotiated wages in these sectors remained below the expected 2% of inflation, the causal link between wages and the number of dismissals seems rather weak, as opposed to the effect driven by the collapse of the real estate bubble.

In the second place, it was argued that the scope of collective bargaining was inadequate as it focused on the industrial level. According to the inverse U-theory (Calmfors and Driffil, 1988), this level is too far from the actual circumstances of the companies, thus imposing too much rigidity to adapt to economic shocks. Moreover, and intermediate-level offers lower capability coordination (Soskice, 1990) than highly centralized collective bargaining system, and causes a poorer macroeconomic performance (high inflation and unemployment). However, Traxler (2003) argued that macro-coordination is not exclusively a matter of the collective bargaining structure but that vertical and horizontal coordination, including formal and informal practices, are more relevant to the governability of the industrial relations system. In the case of Spain, Nonnel et al (2006) show that, until the economic crisis, there was a reasonable degree of governability based on specific legal and cultural elements.

After labour reforms, the priority of company agreements did not result in a large increase in the number of workers covered by company-level agreements; rather their coverage decreased. Although this fall was offset by the increase in company group level agreements, the percentage of both company-level agreements over the total remained unchanged (around 11% of the total number of workers covered by this type of agreement). This means that, although the legal framework was more favourable for this kind of agreement, companies did not opt for them to a higher extent (Hauptmeier, 2012). Indeed, sectoral agreements at the provincial level drastically fell; whereas high-level agreements (interprovincial or national) gained the most weight (45% of the total). All of this indicates that sectoral agreements were not in contradiction with the needs of companies since most firms chose to sign them instead of agreements at the company level.

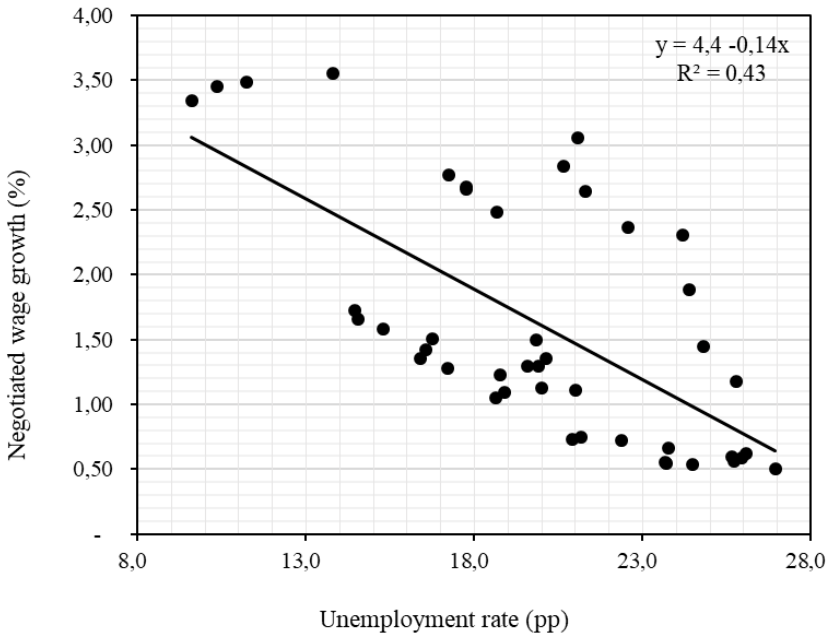
In the third place, the social dialogue focused on concertation and wage moderation during the economic crisis. The first years of the recession were marked by the extension of the Interconfederal Agreement for Collective Bargaining (ANC), initiated in 2002 and subsequently extended until 2008. The central criterion for determining wages in these agreements is based on the rule of agreeing on moderate wage growth. That is, taking as

reference inflation forecasts, productivity growth and wage revisions, which include the difference between the variation in the actual consumer price index and the inflation forecast (in order to avoid the price/wage spiral). Hence, the wage-setting mechanism included flexibility mechanisms to adapt to the business cycle and macroeconomic shocks.

Therefore, the social dialogue oriented towards the moderation of nominal wages (Fernández, Ibañez, and Martínez, 2016), with negotiated wages below the inflation target. This translated into a loss of the average negotiated wages purchasing power in the Agreement for Employment and Collective Bargaining (I-AENC, 2010-12); i.e. the negotiated wages variation was 1.9% compared to 2.5% inflation growth. In the II-AENC (2013-14), and once the economic recession was over, inflation was again higher than the negotiated wage increases (0.6% vis-à-vis 0.5%). Finally, the III-AENC (2015-17) has implied real increases in the negotiated wages (1% compared to -0.1% of inflation) as a consequence of the deflationary process experienced during the economic recovery years.

In the light of the institutional characteristics of the wage-setting mechanism in Spain, it is further questionable whether there is a downward negotiated wage rigidity. Figure 1 shows a quarterly Phillips curve for the period 2008-2018, where we analyse the evolution of the negotiated wage and its relationship with the unemployment rate[2].

Figure 1. Negotiated wages Phillips curve in Spain (2008-2018)



As can be seen, during the economic crisis the negotiated wage in collective bargaining decreased when unemployment increased. Hence, there is a negative and relatively strong relationship between both variables. A one percentage point increase in the

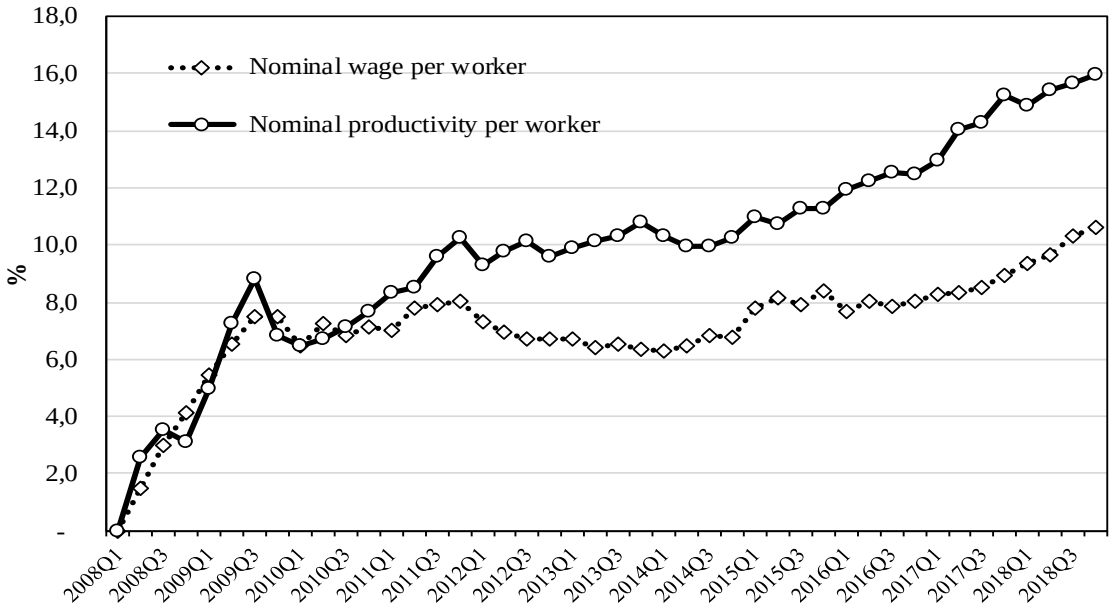
[2] The negotiated wage is measured as the seasonal growth rate of the (nominal) negotiated wages, this data come from the Spanish Collective Bargaining Agreements Statistics. The monthly unemployment rate is measured as the unemployment registered in the State Employment Public Service over the labour force (number of employees, self-employed and unemployed).

unemployment rate reduces the negotiated wage by -0.14pp. In short, negotiated wages were flexible downwards even before the 2012 labour reform.

Nevertheless, these industrial relations reforms and wage moderation seemed to have a strong impact on the wage-setting mechanism by altering the relationship between wages and productivity. Figure 2 evidences that during the first years after 2008 there was no gap between nominal wage and nominal productivity growth. This implies that the wage-setting mechanism correctly adjusted wages to productivity.

However, productivity growth translated to a lesser extent into wage growth since 2010. In other words, during the recession wages grew parallel to productivity, whereas after the implementation of the labour reforms wages rose below productivity. The sizeable cut in wages can thus be attributed to these structural reforms (Cruces et al, 2015; Álvarez, Uxó, Febrero 2019).

Figure 2. The wage-productivity gap since the economic crisis (2008q1=100).



In conclusion, despite the fact that negotiated wages were flexible downwards and correctly linked wages with productivity until 2010, the new institutional framework introduced by the labour reforms changed the wage-setting mechanism. This turning point transformed the negotiating positions of employers and workers and thus modified the collective bargaining system and changed the income distribution reducing the labour share. Consequently, from 2010q2 (the starting point of wage devaluation strategy) to 2013q4 (the trough quarter of the business cycle) the labour share decreases 2.9pp.

2.2. Revisiting Okun's law

The pro-flexibility hypothesis is that recent labour market reforms shifted the Okun curve, i.e. the relationship between unemployment variation and GDP growth rate. This would mean that the Spanish economy currently requires lower GDP growth rates to reduce its unemployment rate than in the previous cycle expansion, as a result of the wage moderation strategy and the increased flexibility in the labour market.

In this sense, Fernandez-Kanz (2016) held that the economic growth threshold for job creation is significantly lower after wage moderation policies. Similarly, Doménech, García and Ulloa (2018) argued that labour market reforms avoided a larger GDP and employment contraction, which implied a reduction of the output growth thresholds for the reduction of unemployment. In addition, Cuerpo, Geli, and Herrero (2018) estimated several Okun's law equations, finding that the Spanish economy requires lower GDP growth to reduce unemployment or to avoid an increase. However, they found that there is a higher elasticity of atypical employment. Hence, a reduction in the unemployment rate is linked to a higher nonstandard jobs rate. Furthermore, Buendía and Sánchez (2017) following a regional approach concluded that the output growth required for employment to grow is lower to the level required to reduce unemployment, which may be related to changes in the labour force participation rate.

Consequently, the evolution of the Okun coefficient in recent years has been increasingly controversial in Spain. In order to tackle this issue, we have determined the components of the Okun's coefficient and estimated whether there is a change after the labour market reforms.

In the first place, we use the basic identity proposed by Gordon (2011) in order to analyses the components of the Okun's law, which decomposes 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:

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

This decomposition is similar to the one used by Bentolila, Dolado and Jimeno (2012) and Cazes, Verick and Al Hussami, (2013) but we add the evolution of the labour force participation rate and the working-age population. Table 1 compares the contribution of each component to the unemployment rate changes over the different phases of the business cycle.

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

Period	Phase	Δu	−Δln(Y)	Δln(Y/H)	Δln(H/E)	Δln(L/N)	Δln(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

Comparing the unemployment rate in the recent business cycle phase with the previous expansion, we can appreciate the volatility of unemployment and the deeper impact of the economic crisis, which increased the unemployment rate significantly (20pp) in five years. Hence, despite the considerable reduction of unemployment during expansionary phases the unemployment rate remains high since the 1990s. As noted by Muñoz de Bustillo & Esteve (2017) a stylized fact of the Spanish labour market is that a high unemployment rate across the cycle is linked to a high employment elasticity to changes in GDP.

The first conclusion is that the main difference between the expansionary period (1995q1-2008q1) and the recovery period (2013q2-2018q4) is that the GDP growth has reduced the unemployment rate to a far higher extent, which means a dynamic response to changes in demand during the recovery period (and after the labour market reforms).

This is due to the evolution of the remaining components of the equation. On the one hand, productivity per hour and hours per worker have been limited. Thus, productivity growth implied a lower reduction of the unemployment rate because this effect was not countervailed by a reduction of the hours per worker. It is noteworthy that productivity increased faster during the recessionary periods than during expansions. This countercyclical behavior of the labour productivity is another stylized fact of the Spanish labour market, which provoked that during the economic crisis half of the unemployment increases were due to productivity growth (9.5pp of 20pp). On the contrary, during the expansion the stagnation of the productivity growth rate involved an accelerated unemployment contraction. In this sense, Vergeer and Kleinknecht (2014) hold that deregulation of labour markets slowed down labour productivity growth because in deregulated economies there is a labour-intensive organization and the people work more hours to produce a similar output growth, and therefore reducing unemployment at the expense of productivity growth.

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

On the other hand, there has been a drastic fall in the labour force participation rate, which led to a rapid contraction of unemployment because it countervailed the effect of the working-age population increase. It is especially significant that the contraction of the labour force participation rate has been larger during the expansion than during the economic crisis. Contrarily, during the previous expansionary phase (1995q1-2008q1), the labour force participation rate and the working-age population grew rapidly and slowed down the reduction of the unemployment rate.

Therefore, the second conclusion is that in order to analyse how GDP growth affects the evolution of unemployment, it is convenient to take into account the labour force to avoid a bias derived from the variations of the activity rate.

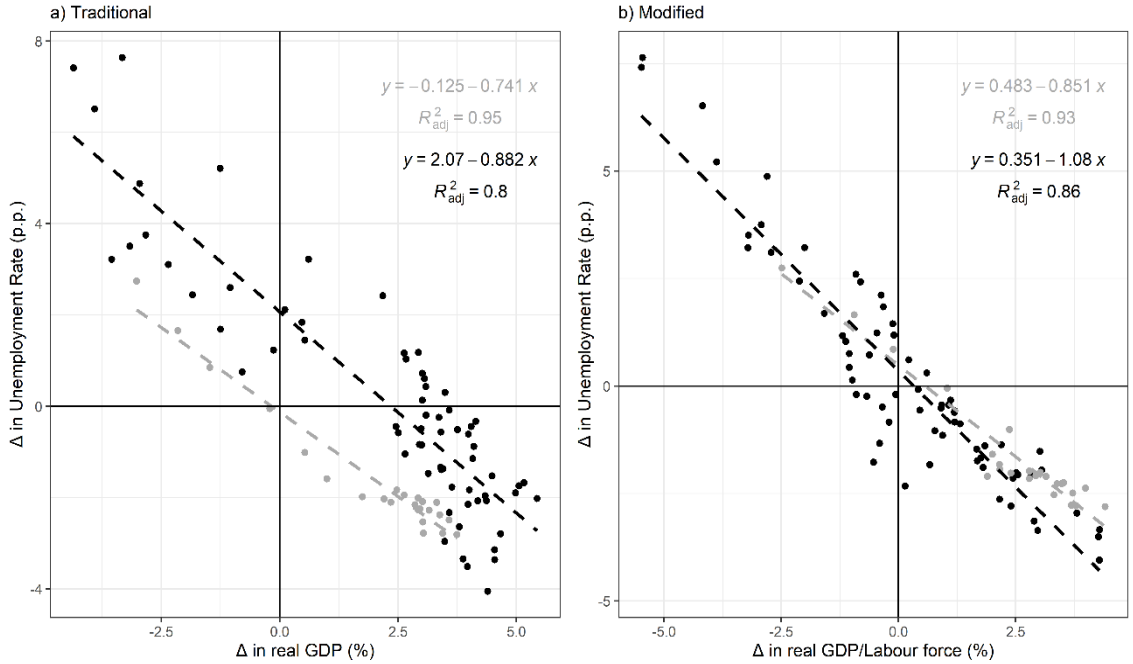
In the second place, Okun's law is usually formulated in two ways (Ball, Leigh, and Louganis, 2017), the growth rate version and the gap version. The first establishes a negative relationship between the quarterly growth rates of the GDP in real terms and the quarterly change of the unemployment rate. This version is composed of a static formalization of contemporary relations and a dynamic formalization, constituted by the lagged variables. In the second case, the estimations use filter techniques to obtain the trend of both variables. Thus, it is possible to calculate the Okun’s coefficient in terms of differences with respect to their trend (cyclical component). In spite of the fact that very extensive literature has developed on ways to estimate this empirical regularity, we will use the first formulation as it is the most intuitive version and appropriate for our aims.

$$\Delta U_t = \alpha + \beta \dot{Y}_t + \omega_t \quad [2a]$$

$$\Delta U_t = \alpha + \beta (\dot{Y}_t / \dot{La}) + \omega_t \quad [2b]$$

On the one hand, there is the traditional Okun law that links GDP growth rates with the variation in percentage points of the unemployment rate [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 [2b]. Figure 3 shows the two estimates, traditional (left) and modified (right).

Figure 3. 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 QSNA (update 07/2019) and EAPS (update 08/2019)

Comparing both estimations, the results are quite different because in the left plot there is clearly a shift in the curve, providing evidence in favour of the first hypothesis (H1). However, the right panel, where the GDP has been modified to account for the labour force, does not show any shift in the curve. Thus, while in the traditional form an increase of almost 3.5% of GDP is necessary to reduce the unemployment rate in one pp during the period 1995-2012, in the second period (2013-2018) it is practically 1.12% of GDP growth.

On the contrary, in the modified equation the growth of GDP adjusted by the labour force necessary to reduce one 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 1pp of the unemployment rate rises to 1.74%. Hence, the third conclusion is that

when labour force is taken into account there is no change in the output threshold for the reduction of the unemployment rate.

In short, this analysis allows us to affirm that it is necessary to introduce the evolution of the labour force in order not to overestimate the effect that the institutional aspects have on the reduction of unemployment. We can thus reject the first hypothesis (H1) because after 2012 job destruction was similar (H1.1) and the reduction of the unemployment rate was analogous (or even lower) in the expansionary phase (H1.2).

Indeed, employment recovers rapidly during the period 2013-2018 due to the labour-intensive character of the Spanish economy, which is mirrored in the stagnation of labour productivity growth, and as a result of the falling 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.

3. 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.

3.1. An extended Bhaduri-Marglin model with labour market for the Spanish economy

There are previous Bhaduri-Marglin estimations for the Spanish economy, being the most relevant Naastepad and Storm (2006), Storm and Naastepad (2012), Onaran and Obst (2016), Álvarez, Uxó and Febrero (2017), Villanueva et al. (2018). All of them find that the demand regime in Spain to be wage-led. Our purpose is not to determine whether the demand regime is wage-led or profit-led, but to use the results to measure the effect of the wage devaluation on unemployment.

The Bhaduri-Marglin model consists of a set of equations in which changes in the labour share affect different components of the private aggregate demand (we consider public expenditure exogenous).

This impact takes place directly in the case of household consumption, as the propensity to consume out of wages is usually higher than the same propensity out of profits. In addition, in the case of private investment because this variable can be sensible to the profit rate (which include the profit share). Although also through changes in domestic or export prices via unit labour costs (trade competitiveness) in the case of net exports.

In this section, we use the estimation of these single equations to obtain the value of all the elasticities that determine the total effect of 1p.p. increase of the labour share on private consumption, private investment and net exports, and therefore on private aggregate demand. We also estimate the Okun coefficient to determine the extent to which this effect on private aggregate demand affected the unemployment rate.

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. In addition, all variables are expressed in real terms, except for prices, long-term interest rates, and nominal unit labour cost. As the ADF tests suggest that most variables are not stationary, we differentiate the variables. Hence, the estimated coefficients are elasticities.

Since long-term interest rates and the profit share are stationary, we use these variables in levels. 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 2018) when the autoregressive term is AR(1). In the remaining cases, we introduce as many lags as the autocorrelation function indicates.

Using these data, we have estimated the following six equations following Álvarez et al (2019):

$$logC = c_o + c_w logW + c_r logR + c_{dh} logDh + c_{dhy} logDhY \quad (1)$$

$$logI = i_o + i_y logY + i_\pi log\pi + i_r r + i_{dh} logDh + i_{dc} logDc + i_{dpy} logDpY \quad (2)$$

$$logX = x_o + x_{y*} logY^* + x_{reer37} logREER37 \quad (3)$$

$$logM = m_o + m_y logY + m_{ppm} logPPM \quad (4)$$

$$logP = p_o + p_{ucl} logUCL + p_{pm} logPM \quad (5)$$

$$logPX = px_o + px_{ucl} logUCL + px_{pm} logPM \quad (6)$$

First, equations (1) and (2) 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) and nominal household debt-to-GDP ratio (DhY) as control variables, following to Onaran et al. (2011), Stockhammer and Wildauer (2016), Onaran and Obst (2016) and Álvarez et al. (2019).

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 (Onaran and Galanis, 2012). The profit share is introduced as a proxy for profitability as a variable of the existence of internal resources to fund investment. Nominal long-term interest rates should have a negative sign because they contain the financial cost of the investment. Likewise, corporate debt (Dc), household debt (Dh), private debt-to-GDP ratio (DpY) have been included as proxies of financial markets.

[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 also been adjusted accordingly.

Afterward, equation (3) estimates the effects of foreign demand (total GDP of OECD countries, Y*), and price variables (relative effective exchange rate vis-à-vis 37 industrialized 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 (4) 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.

Additionally, 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 (5) 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. The coefficient p_{ulc} represents to what extent changes in unit labour costs are transferred to domestic prices.

Furthermore, equation (6) estimates export prices as a function of both unit labour costs (ULC) and import prices (PM). Similarly, px_{ucl} 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.

Finally, Okun's coefficient is estimated following Hartwig (2014) and IMF (2010): where

$$logU_t = u_o + \beta_{yt} logY_t + \sum_{i=1}^{n} \beta_{yi} logY_{t-i} + \sum_{i=1}^{n} \beta_{ui} logU_{t-i} \quad (7)$$

U_t denotes the unemployment rate and Y_t denotes real GDP. β_{yt} captures the contemporaneous effect -or short-run effect- of 1pp in real GDP on the unemployment rate.

$$\beta^* = \frac{\beta_{yt} + \sum_{i=1}^{n} \beta_{yi}}{1 - \sum_{i=1}^{n} \beta_{ui}} \quad (8)$$

The long-run effect or dynamic effect β^* is given by equation (8). Table 2 summarizes the obtained results and the calculation of the total effect will be done in the following section.

[4] This aggregate of industrialized economies includes: EU28, Australia, Canada, Japan, Mexico, New Zealand, Norway, Switzerland, Turkey and USA.

Table 2: Estimation results (1995q1-2018q4)

	(1) CONSUMPTION	(2) INVESTMENT	(3) EXPORTS	(4) IMPORTS	(5) PRICES	(6) EXPORT PRICES	(7) UNEMPLOYMENT
dlogY$_t$		3.193***		2.433***			-0.372***
		(0.710)		(0.561)			(0.0908)
dloghodebt$_t$	0.166*	1.252**					
	(0.0761)	(0.374)					
dlogW$_t$	0.369***						
	(0.0819)						
dlogYW$_t$			2.855***				
			(0.176)				
dlogREER37$_{t-2}$			-0.390~				
			(0.202)				
dlogPPM$_{t-1}$				0.372*			
				(0.143)			
dlogULC$_t$					0.139**		
					(0.0453)		
U$_t$					-0.0219***		
					(0.00392)		
dlogPM$_t$						0.434***	
						(0.0339)	
Constant	0.00397	-0.340**	-0.0171**	-0.0109	0.0844***	0.0180**	0.142*
	(0.00719)	(0.121)	(0.00540)	(0.0220)	(0.0109)	(0.00535)	(0.0594)
trend		0.00390*				-0.000186*	
		(0.00165)				(8.80e-05)	
time dummies	-0.0131***	0.0386***		-0.110***	-0.0119***	0.0164~	0.687*
	(0.00254)	(0.0103)		(0.0222)	(0.00227)	(0.00930)	(0.261)
Observations	77	76	90	91	92	93	95
R-squared	0.450	0.540	0.606	0.534	0.666	0.686	0.716
adj. R-squared	0.428	0.514	0.597	0.518	0.654	0.675	0.707
p-value F test	0.00897	0.0136	0.00757	0.00569	0.00307	0.00295	0.00206
Durbin Watson statisti	1.663	2.239	1.889	1.753	2.043	1.922	1.569
Shapiro normality test	0.400	0.120	0.372	0.744	0.192	0.398	0.256
Log likelihood	275.8	170.5	227.2	206.2	387.9	321.1	-34.81
AIC	-543.6	-330.9	-448.4	-404.3	-767.8	-634.3	77.62
BIC	-534.3	-319.3	-440.9	-394.3	-757.7	-624.1	87.84
Rho / AR(1)	0.879	0.918	0.620	0.833	0.690	0.661	0,409

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05, ~ p<0.10

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

Firstly, we calculate the effect of a change in the labour share on consumption (7). Using equation (1), 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 (2019) 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 drive consumption up. On the contrary, the private debt-to-GDP (DhY) ratio has no statistically significant effect.

$$\frac{\Delta C/Y}{\Delta \Omega} = \left(c_w * \frac{Y}{W} * \frac{C}{Y} - c_r * \frac{Y}{R} * \frac{C}{Y}\right) = (\beta_W - \beta_R) * \frac{C}{Y} \quad (7)$$

$$\frac{\Delta I/Y}{\Delta \Omega} = (- i_\pi * \frac{I}{R}) + \left[\frac{\Delta Y/Y}{\Delta \Omega}\right] * i_y \frac{I}{Y} \quad (8)$$

$$\frac{\Delta XN/Y}{\Delta \Omega} = \frac{\Delta X/Y}{\Delta \Omega} - \frac{\Delta M/Y}{\Delta \Omega} \quad (9)$$

$$\left[\frac{\Delta X/Y}{\Delta \Omega}\right]_{Xcomp} = \varepsilon_\Omega^X * \frac{X}{Y} * \frac{1}{\Omega} = \left(\varepsilon_\Omega^{ULC} * \varepsilon_{ULC}^{PX} * \varepsilon_{PX}^X\right) * \frac{X}{Y} * \frac{1}{\Omega} \quad (9a)$$

$$\left[\frac{\Delta M/Y}{\Delta \Omega}\right]_{Msust} = \varepsilon_\Omega^M * \frac{M}{Y} * \frac{1}{\Omega} = \left(\varepsilon_\Omega^{ULC} * \varepsilon_{ULC}^P * \varepsilon_P^M\right) * \frac{M}{Y} * \frac{1}{\Omega} \quad (9b)$$

Secondly, there are two effects of a change in the labour share on investment (8). On the 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.

Moreover, 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. Table 3 presents the total effect on GDP and the indirect effect on investment driven by changes in functional income. The total effect on investment will depend on the ex-ante and ex-post effects. If the ex-ante effect were higher than the ex-post effect, the investment would be profit-led even if aggregate demand were wage-led (Blecker, 2017).

Table 3. Labour share effect on GDP and Unemployment (2010-2013)

	Elasticities	Ratio	Marginal effect	Multiplier	Effect 1 pp	Wage share	Total effect on GDP	Okun coefficient	Δ Unemployment rate
	(a)	(b)	(c)=(a)*(b)	μ	(d)=(c)*μ	Δ Ω	(e)=(d)* Δ Ω	β	f=(e)*β
(1) Consumption	0,37	1,15	0,43	1,46	0,62	-2,87	-1,78	-0,63	1,12
(2) Investment	3,19	0,17	0,22	1,46	0,32	-2,87	-0,93	-0,63	0,59
(3) Net exports			-0,03	1,46	-0,04	-2,87	0,10	-0,63	-0,07
(4) =(1)+(2)+(3)			0,62	1,46	0,91	-2,87	**-2,61**	-0,63	**1,64**

Source: Author's own calculations, based on Eurostat quarterly data

In our case, the direct profitability effect is not statistically significant, the same happens when alternative lag structures and specifications are tested. Therefore, this effect has not been included in Table 3 and investment also is wage-led, as we find a strong positive relationship between income and private investment, showing a strong accelerator.

Although some previous papers have found a positive impact of the profit share on investment (Naastepad and Storm, 2006; Storm and Naastepad, 2012), we believe this is might be due to the period used (1964-2000). There is another significant variable, household debt, which could play a determinant role of the high residential investment during the period 1995-2007. Neither long-term interest rates nor other debt variables have shown a statistically significant relationship with investment.

The marginal effect of net exports on GDP (9) depends of the impact of the labour share on exports (9a) and imports (9b). 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 imports by domestic production, 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 A.1).

This relationship between unit labour cost and domestic prices resembles the estimation results yielded by Onaran and Obst (2016) and Álvarez et al. (2017). In countries that are similar to Spain, the unit labour cost coefficient is significant, yet it is much smaller than that of the domestic prices.

Once the effect of the labour share on GDP and that of GDP on employment have been calculated (Table 3), we estimate the direct effect of wage devaluation on unemployment during the recession. During the period 2010q2-2013q4, the unemployment rate increased

by 5.8pp whereas the labour share decreased by -2.87pp. According to our estimations, a fall in GDP by -2.61 pp, derived from wage devaluation, rose the unemployment rate by 1.64pp. This means that 28.1% of the unemployment rate increment occurred directly as a consequence of the wage devaluation.

4. Conclusions

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. We have tested these hypotheses analysing changes in Okun's law finding no significant shift in the curve 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 falling of the labour share during several years (2010q2-2013q4). A mainstream idea is that there is a wage/unemployment trade-off in the Spanish economy and therefore the unemployment falls due to wage moderation. However, in a wage-led economy, like Spain (Álvarez, Uxó & Febrero, 2017), a reduction in the labour share translates into a contraction of GDP and as well as a higher unemployment rate, given the high Okun coefficient.

Consequently, wage devaluation has hampered both GDP growth and unemployment reduction. Estimating an extended version of the single-equations Bhaduri-Marglin model with quarterly data from 1995q1 until 2018q4, the results indicate that the unemployment rate increased by 1.64 p.p. due to the contraction of 2.87 p.p. in the labour share. This implies that 28.1% of the unemployment increase was a direct result of wage devaluation. The main channels were the strong restriction of private consumption and investment and the weak impact on net exports.

All in all, Spain constitutes a good case study for providing evidence on the effectiveness of flexibilization and deregulation because, as pointed by Sturn (2013), the network of institutional complementarities is a crucial issue for the effectiveness of institutional changes. Thus, in this case, labour reforms changed the wage-setting mechanism and drastically reduced the wage growth and the labour share, which implied a contraction of domestic demand and an increase in the unemployment rate in the short-term.

Finally, further research should analyse the impact on unemployment due to the effect of capital accumulation and hysteresis in the medium-term. Since wage devaluation implied a slower growth of investment and the hysteresis effect is relevant, the unemployment rate is expected to be higher in the medium-term.

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6. Appendix

Table A.1. 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
var	**ƐulcΩ**	**Ɛpxulc**	**ƐXpx**	**ƐXΩ**	**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							
	ƐulcΩ	**Ɛpulc**	**ƐMp**	**ƐMΩ**	**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: Author's own calculations, based on Eurostat quarterly data

Table A.2. 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