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Internal devaluation in a wage-led economy: the case of Spain

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The aim of this paper is to study the impact of wage devaluation policy on the recent recovery experienced by the Spanish economy. For this purpose, we use the theoretical distinction between wage-led and profit-led economies. We address, for the first time in the literature, an in-depth analysis of the Spanish economy using the Bhaduri-Marglin model. We find that the Spanish economy can be characterized as a wage-led economy: a fall in the wage share has a contractionary effect on GDP growth. Our results point to two important conclusions, when we use this model to assess the internal devaluation policy. First, we do not see an export-led recovery in Spain during past years, driven by recent supply-side reforms. And, second, a pro-labour distribution of income would reinforce economic growth: according to our calculations, internal devaluation policy detracted an average of 0.2 percentage points of annual economic growth during the period 2009–17.

Key words: Distribution, Demand, Wage share, Bhaduri-Marglin model, Debt
JEL classifications: E24, E25, E64

1. Introduction

One of the main economic policies promoted by the governments of peripheral Eurozone countries to overcome the Great Recession of 2008 was internal devaluation. In Spain, this policy has been applied between 2009 and 2017, justified by two arguments.

First, internal devaluation (understood as a reduction in unit labour costs) is posited by EU institutions as the only way to correct external imbalances and restore price competitiveness among monetary union members.

Second, and according to European authorities, internal devaluation helps restore economic growth. The impulse of external demand because of improved price competitiveness should offset the decline in domestic demand caused by both fiscal austerity

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measures and a general reduction in wages. Thus, if internal devaluation works, it should trigger an export-led growth recovery.

Has internal devaluation policy proved successful in Spain? Many voices proclaim that it has (Doménech *et al.*, 2015; Bank of Spain, 2016; European Commission, 2016), given that Spain corrected its external imbalances and grew at an annual rate of 3.2% in 2015–17.

The present paper aims to use the theoretical distinction between wage-led and profit-led economies to consider the impact of internal devaluation policy on GDP growth for the case of Spain. We assess to what extent wage devaluation in Spain has proved useful in triggering an export-led strategy, boosting aggregate demand and overcoming the crisis.

The distinction between wage-led and profit-led economies is presented by the Bhaduri-Marglin model, a post-Kaleckian model that describes the causal links between functional income distribution and economic growth (Bhaduri and Marglin, 1990). We adopt this theoretical approach in our research.

According to this model, the final effect of a change in functional income distribution on aggregate demand is undetermined, and depends on the specific characteristics of each economy. Specifically, it depends on the elasticity of consumption, investment and net exports to a change in wages, profits, labour costs and prices. In other words, it is an empirical issue. Of course, each regime—whether wage-led or profit-led—leads to different policy implications that should be considered when authorities seek to support a sufficient level of aggregate demand.

Briefly, two general conclusions can be drawn from the empirical literature inspired by the Bhaduri-Marglin model: 1) major OECD economies tend to be wage-led demand regimes. Therefore, policies that depress wages cause net contractionary effects; 2) when the decrease in the wage share takes place simultaneously in a group of countries (for example, the Eurozone), even those economies that initially appeared to be profit-led become wage-led when considering macroeconomic effects as a whole. In this context, the policy of internal devaluation proves counterproductive, since it produces a recessive bias.

We estimate a Bhaduri-Marglin model for the period 1995–2017, paying attention to the years of internal devaluation (2009–17). Our research contributes to this empirical literature through three elements, relatively new and different.

First, we put the Bhaduri-Marglin model at the service of a short-term policy analysis, in order to explore the pertinence of the internal devaluation applied during the crisis. Said model is normally used to characterize the structural nature of an economy, rather than to assess a specific policy. But, since internal devaluation policy has led to a change in functional income distribution in the Spanish economy, deepening the downward trend[1] of the wage share (Figure 1), we can use the Bhaduri-Marglin model as a tool to assess the impact of wage devaluation on economic growth.

Second, the empirical literature which uses this approach has been confined almost exclusively to major OECD economies or, on some occasions, to certain emerging countries. Eurozone peripheral countries have rarely been included in the analyses, and ours is the first in-depth study of the Spanish economy that draws on the Bhaduri-Marglin model.

[1] The fall of the wage share in 2000–07 is mainly due to the stagnation of real wages and to the 'composition effect': among the new jobs created, low-wage jobs predominate. The wage share increase observed in 2008–09 occurs because temporary jobs (the lowest paid) are the first to be destroyed with the crisis.

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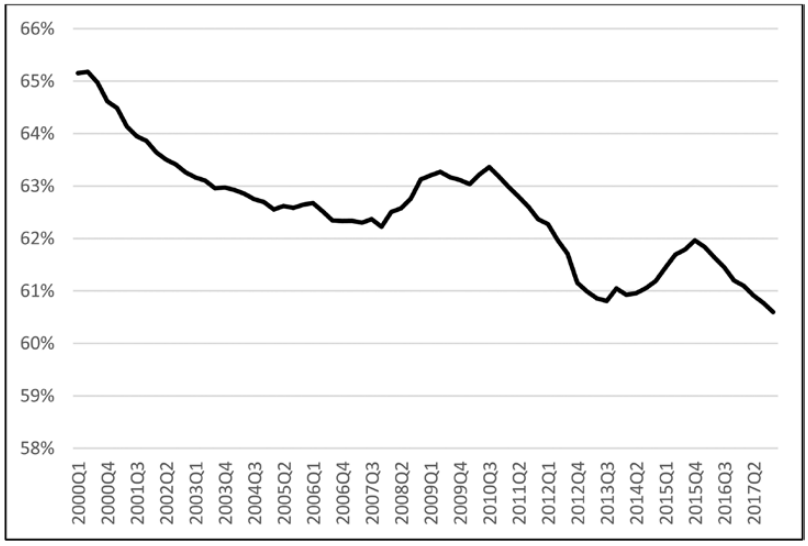

Fig. 1. *Adjusted wage share, Spain (% GDP)*
**Note:* Adjusted wage share is used: compensation per employee as percentage of GDP per person employed. Moving average of last four quarters.
Source: Eurostat

Third, few studies expand the Bhaduri-Marglin model to include financial variables. We do it in order to consider the effect of private debt on consumption and investment. Since financialization has significantly altered the main macroeconomic drivers over the past two decades, ignoring such a phenomenon might lead to possible bias in the empirical estimates.

The structure of our research is as follows. After this introduction, in the second section we analyse the strategy of internal devaluation in Spain, and its supposed rationale. In Section 3, we examine whether the Spanish economy is wage-led or profit-led, and in the fourth section we evaluate the effects of internal devaluation on economic growth. Finally, in the fifth section we present our conclusions and draw some economic policy implications.

2. Internal devaluation policy in the Spanish economy: the period of 2009–17

2.1 What is it and how does internal devaluation policy theoretically work?

Internal devaluation can be defined as a set of economic policy measures designed to reduce wages and unit labour costs (ULC), in order to achieve lower inflation than international competitors. The ultimate goals of this policy are to improve external competitiveness, correct external imbalances and restore economic growth.

Since 2009, wage moderation in Spain has been the result of the crisis itself—weakening the bargaining power of workers—but also the product of successive labour market reform laws (2010, 2011 and 2012). These reforms decentralized collective bargaining, reduced the regulatory scope and duration of collective agreements, facilitated opt-out clauses and alleviated dismissal costs and procedures.

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According to the rationale of internal devaluation, a decrease in nominal wage growth, and lower ULC growth, are required to achieve enhanced price competitiveness aimed at increasing net exports. A reduction in ULC should result in a lower rate of inflation of domestically produced goods and services. Nevertheless, fulfilling such a condition depends on profit margin performance and the degree to which changes in labour costs are passed on to prices. If higher price competitiveness is actually achieved, the final effect on the current account will depend on the price elasticity of exports and imports.

When changes in nominal wages are passed on to prices in full, and profit margins remain constant, real wages and wage share should also remain unaltered. However, if the decrease in price inflation is less sharp than the decrease in wage inflation, as has been the case in Spain, internal devaluation will have distributional consequences, reducing the wage share (as seen in Figure 1).

Internal devaluation might also affect net exports through a second channel: its negative impact on domestic demand, given that private consumption depends positively on wages. This will reduce imports and improve the balance of goods and services.

Furthermore, internal devaluation is prescribed not only as a tool to correct external imbalances but also as an instrument to boost economic growth. Positive effects of this economic policy would, theoretically, be the outcome of two combined forces:

- Price competitiveness recovery would lead to an increase in net exports, offsetting the contractionary effect of wage cuts on internal demand.
- Improved profit margins would be used by companies to restore investment, therefore boosting new production and new demand for labour.

2.2 Implementing internal devaluation in Spain and its consequences

The causal links explained in the previous section have not actually occurred in Spain.[2] We examine how the reduction in ULC has only partially been transformed into lower inflation and improved external competitiveness, whilst internal devaluation has in fact depressed domestic demand.

Nominal employee compensation slowed down considerably in 2009 (Figure 2), reaching negative annual growth rates during five quarters (2012–13). ULC evidenced an even sharper contraction.

This has led to almost eliminating the deviation between Spanish and Eurozone ULC that occurred between 1999 and 2008. In 2017, the accumulated increase in ULC since EMU began was only 2% higher in Spain than in the Eurozone (in 2008 this difference was 15%). Thus, the first step of the above-described internal devaluation policy has been fulfilled: the decrease in nominal wages has led to a decrease in ULC relative to competitors.

Following Kalecki (1971), the impact of a reduction in ULC on prices and income distribution depends on the oligopoly power of firms. In Figure 3, we can see how the reduction in ULC has not been mainly transferred to a decrease in GDP deflator, but to an increase in profit margins, since oligopoly structures have remained strong in the Spanish economy during the crisis. While the accumulated decrease in ULC between 2009 and 2017 was –6%, the GDP deflator registered an accumulated increase of

[2] For a more in-depth analysis, see Uxó *et al.* (2016).

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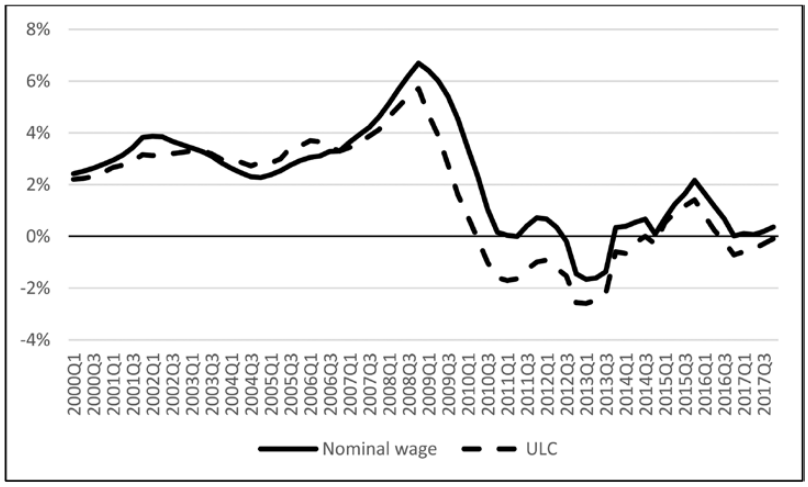

Fig. 2. *Nominal wages and unit labour costs, Spain (annual growth rate)*
Source: Eurostat and author's calculations.

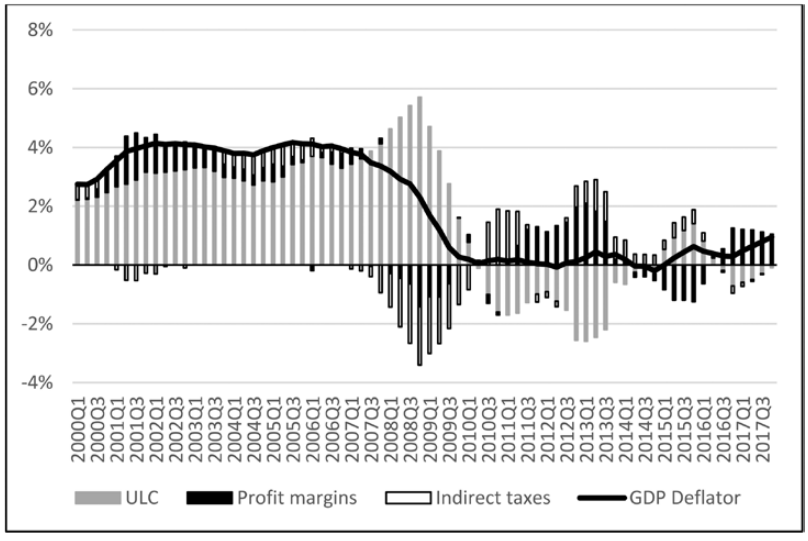

Fig. 3. *Contributions to the growth rate of GDP deflator, Spain*
Source: Eurostat and author's calculations.

1.5%. As can be seen in Figure 3, this is explained because profit margins have been increasing at an average annual growth rate of 0.5%. The consequence of this has been the fall of the wage share.

To what extent have these reductions in ULC, wage share and prices meant an improvement in price competitiveness? To gauge this, we use the real effective exchange rate for 37 major trading partners, obtained using unit labour costs (REER-ULC) and the price deflator of exports (REER-EXP). Considering 2009 as the base year, Spain

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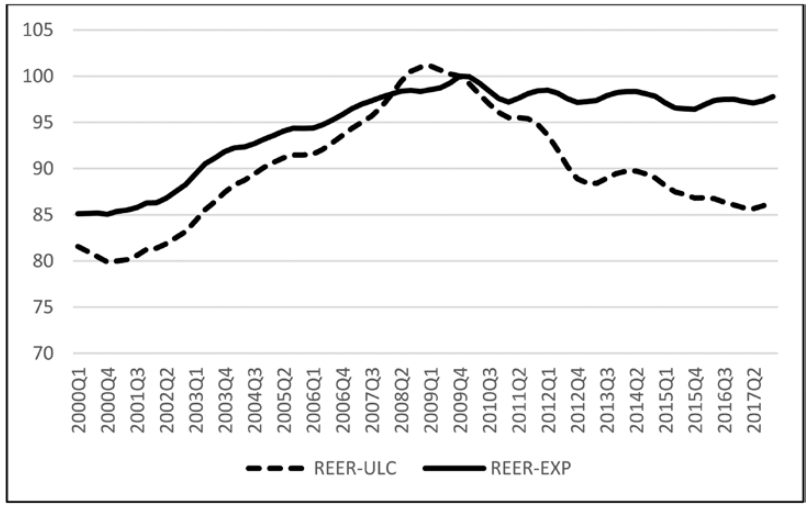

Fig. 4. *Real Effective Exchange Rate (37 main partners, 2009 = 100), Spain*
Source: Eurostat and author's calculations.

recorded a 14% real depreciation in terms of ULC. Nevertheless, this depreciation is seen to be much lower when measured in terms of export prices (the REER-EXP has only decreased by 2%, as can be seen in Figure 4), since the decline in ULC is mainly captured by profit margins.

This modest gain in price competitiveness is consistent with the stylized facts observed in the export sector: export growth during the period 2009–17, as well as export contribution to GDP growth, are only slightly higher than before the crisis (see Table 1). Furthermore, the rapid adjustment of the Spanish external sector (going from a borrowing position of over 10% in 2008 to a lending one of 2% in 2015), and its net contribution to economic growth in recent years, has not been so much the result of the rapid growth in exports but rather the consequence of the collapse of imports.[3]

This adjustment of the external sector and the evolution of economic growth in Spain are mainly explained by the progress of domestic demand (Figure 5). It seems difficult therefore to say that the Spanish recovery after 2014 is an export-led recovery, triggered by the latest labour market reforms. Internal devaluation does not seem to be a determinant of economic recovery.

In fact, different studies (Cárdenas *et al.*, 2017) point to the key role of other factors to understand the Spanish economic recovery, such as external tailwinds (depreciation of the euro, falling energy prices and the ECB's quantitative easing policy), and also the abandonment of fiscal austerity in 2015–16. After years of strong fiscal cuts, in 2015–16 Spain implemented a noticeable expansionary fiscal policy, with a 1% positive contribution of public demand to GDP growth.

The stylized facts seen here do not match the orthodox assumptions reviewed in Section 2.1. Wage devaluation has only partially translated into improved price

[3] Although the effect on price competitiveness has been limited, declining wages have led to higher profitability in the tradable goods sector, and this factor has shifted the decision to increase production in some plants located in Spain, whose output is exported.

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Table 1. *Spanish external sector*

Spain		2000–08	2009–13	2014–17
Contribution to GDP growth	Domestic demand	4.0%	–3.6%	2.8%
	External demand	–0.5%	1.7%	0.1%
	* Exports	1.0%	0.6%	1.4%
	* Imports	–1.5%	1.1%	–1.4%
	Total GDP	3.5%	–1.9%	2.9%
Real growth rate	Exports	4.1%	4.4%	4.3%
	Imports	6.7%	–1.6%	5.3%
Export market share*		2.3	2.0	1.9

*Goods and services, % of world total.
Source: Eurostat and author's calculations.

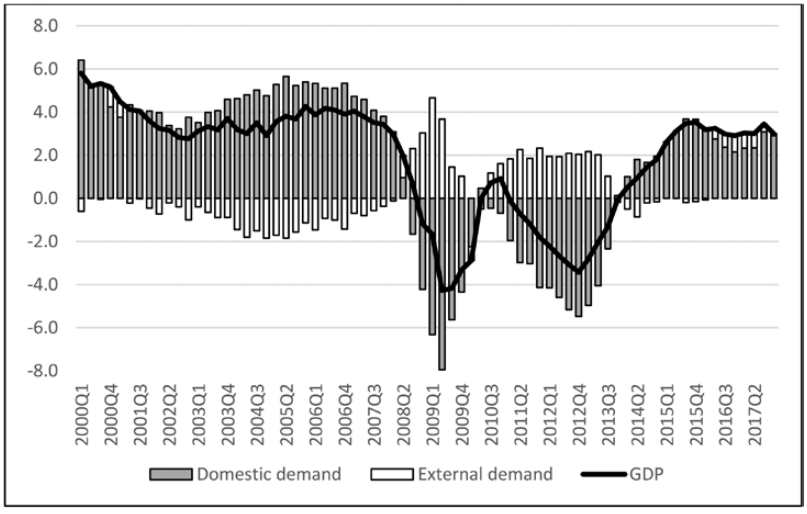

Fig. 5. *Contributions to GDP growth, domestic and external demand, Spain (%)*
Source: Eurostat and author's calculations.

competitiveness. Another part has gone towards increasing corporations' profit margins, thus reinforcing the downward trend in the wage share. Finally, although there has been some improvement in external competitiveness, we cannot talk about an export-led recovery, since it is domestic demand that has proven to be the main driver of growth.

3. Functional income distribution and aggregate demand in Spain

In this section, we estimate the effect of a change in functional income distribution on aggregate demand. We use these estimates to assess whether the internal devaluation policy implemented in 2009–17 has been appropriate to stimulate economic growth.

3.1 Theoretical framework: an extended Bhaduri-Marglin model

Bhaduri and Marglin (1990) analysed the effects of changes in functional income distribution on consumption, investment and economic growth. The starting point for their model is a basic fact: salary has a twin dimension in our economy, being at the

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same time both a cost to business and the main determinant of private household consumption. Said authors study the contradictory impact of a distributive change on the components of aggregate demand.

Given an increase in the wage share, consumption will rise as the propensity to consume out of wages is higher than the propensity to consume out of profits. Nevertheless, an increase in the wage share will have conflicting effects on corporate investment, being negative due to increased costs, and positive due to the accelerator effect (an increase in aggregate demand results in a proportionately larger rise in capital investment). Finally, net exports might fall if the increase in the wage share leads to a loss of price competitiveness.

Therefore, the net effect of an increase in the wage share will depend on whether the elasticity of investment vis-à-vis profits, and net exports elasticity vis-à-vis changes in relative prices, are large enough to offset the expansionary effect on consumption. In this section, we obtain an empirical estimation of these elasticities.

Real aggregate demand (Y) consists of consumption spending (C), investment (I), net exports (NX) and government spending (G). The demand exerted by the public sector is considered an exogenous factor, and thus we write aggregate demand as follows (where Ω is the wage share, and Z other control variables):

$$Y = C\left(Y,\Omega,Z_C\right) + I\left(Y,\Omega,Z_I\right) + NX\left(Y,\Omega,Z_{NX}\right) + G \tag{1}$$

Our goal is to analyse how total demand changes when the wage share rises or falls. The final impact on aggregate demand of an increase in the wage share is the result of two effects: first, the direct influence of this change on each component of aggregate demand, assuming that total income remains constant, and second, the multiplier effect; consumption, investment and net exports alter as a consequence of second-round effects. This can be written as follows:

$$\begin{aligned}\frac{\partial Y}{\partial \Omega} &= \frac{1}{1-\left(\frac{\partial C}{\partial Y}+\frac{\partial I}{\partial Y}+\frac{\partial NX}{\partial Y}\right)}\left(\frac{\partial C/Y}{\partial \Omega}+\frac{\partial I/Y}{\partial \Omega}+\frac{\partial NX/Y}{\partial \Omega}\right)\\ &= \mu\left(\frac{\partial C/Y}{\partial \Omega}+\frac{\partial I/Y}{\partial \Omega}+\frac{\partial NX/Y}{\partial \Omega}\right)\end{aligned} \tag{2}$$

The second term of this expression is the sum of the partial effects of income distribution on each component of demand, while the first term (μ) is the multiplier effect. Having estimated this equation, the results will allow us to ascertain whether Spain behaves as a wage-led or profit-led economy, as well as the consequences of the wage policy applied during the period of internal devaluation.

We estimate separate equations for consumption, investment, prices, imports and exports. The wage share is, either directly or indirectly, an explanatory variable in all these functions, together with other variables. We extend the Bhaduri-Marglin model, incorporating financial variables in the consumption and investment functions. The coefficients estimated are elasticities that allow us to calculate the marginal effects of changes in income distribution on aggregate demand. The consumption function is:

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$$C = c_0 + c_W W + c_R R + c_{Dh} Dh + c_{DhY} DhY \tag{3}$$

where the determinants are wages (W), profits (R), household debt (Dh) and the household debt-to-GDP ratio (DhY), and $c_W,\ c_R,\ c_{Dh} > 0, c_{DhY} < 0$.

We expect both W and R to have a positive effect on consumption, but since the propensity to consume out of wages is likely to be higher than the propensity to consume out of profits, consumption will increase if we have a distributive change favourable to wages.

The influence of debt on the consumption function is contradictory. First, changes in household net debt (i.e. gross increase in liabilities minus repayments) tend to boost disposable income in expansionary credit cycles, providing a source for consumption. Increases in the level of borrowing are expansionary when the demand effect induced by new credit exceeds lost consumption spending arising from the amount of additional interest needed to service the extra debt. But, second, overaccumulation of liabilities can lead to risky increases of the debt-to-income ratio for households, with a debt service that can be a constraint for consumption. Therefore, we expect that increases in household net debt (Dh) affect consumption growth positively, and we expect the household debt-to-GDP ratio (DhY) to have a negative impact on consumption. The first variable aims to capture the 'flow effect' of new credits issued, while the second tries to capture the 'stock effect' associated with the total level of debt.

The investment function is:

$$I = i_0 + i_Y Y + i_\pi \pi + i_{Dh} Dh + i_{Dc} Dc + i_{DpY} DpY \tag{4}$$

where the determining factors are income (Y), profit share (π), household debt (Dh), corporate debt (Dc) and private debt-to-GDP ratio (DpY). We expect all these factors to influence investment positively, except for the private debt-to-GDP ratio. That is to say, we expect $I_Y,\ I_\pi,\ I_{Dh}, I_{Dc} > 0 \; and \; I_r,\ I_{DpY} < 0$.

Income is used as a proxy for expected demand, in line with the accelerator effect. In addition, we use the profit share as an indicator of profitability. Private net debt is the sum of household and corporate net debt. In a country like Spain, which has experienced a housing bubble and strong residential investment, gross capital formation will be strongly determined not only by corporate debt but also by household debt. The private debt behaves as in the consumption equation: positive changes in net debt (again, gross increases minus repayments) tend to be expansionary up to a certain point. From there, overaccumulation of liabilities and the increase in the total stock of debt will entail a contractionary effect on investment. This contractionary effect linked to over-indebtedness (the 'stock effect') should be captured by the private debt-to-GDP ratio (DpY), with an expected negative sign of the coefficient.

Net exports are:

$$\mathrm{NX} = \mathrm{NX}\left(\mathrm{Y},\ \mathrm{Y}^f,\ \mathrm{Pm},\ \mathrm{Px}\right); \tag{5}$$

$$\text{with } NX_{Y^f},\ NX_{Pm} > 0;\ NX_Y, NX_{Px} < 0$$

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Net exports will depend positively on the income of the rest of the world (Y^f), as this increases exports, and will depend negatively on national income (Y), since it sparks an increase in imports without affecting exports.

Export and import prices are also decisive to estimate net exports. An increase in import prices will cut imports, while export prices are inversely related to net exports (a fall in these prices will mean higher exports). In addition, export prices will depend, as will domestic prices, on ULC. Thus, changes in the wage share can affect external competitiveness, since increases in ULC may reduce net exports.

3.2 Related empirical literature

The Bhaduri-Marglin model has become widely used, resulting in abundant empirical literature aimed at determining the macroeconomic consequences of redistribution towards profits or wages. Surveys of this literature can be found in Lavoie and Stockhammer (2013) and Stockhammer (2015).

Most of this literature, as we can see in Table 2, concludes that aggregate demand is predominantly wage-led in developed countries, particularly for domestic demand but also for total demand.

Nevertheless, existing research tends to examine main OECD economies, with few studies analysing peripheral Eurozone countries. Some notable exceptions are Stockhammer and Wildauer (2016), as well as Onaran and Obst (2016). And to date, there is no study in the literature addressing an in-depth analysis of the Spanish economy using the Bhaduri-Marglin model.

Bhaduri-Marglin literature mainly uses traditional determinants to explain consumption, investment and net export functions (including wages, profits, income, ULC and prices), and little attention has been paid to financial variables. But the implications of not considering these variables when describing an economy as wage-led or profit-led may be important, since the reported results may suffer from omitted variable bias (Hein, 2016).

Onaran *et al.* (2011) and Stockhammer and Wildauer (2016) extend the Bhaduri-Marglin model to include financial variables, as we also do, and find strong effects of debt in the aggregate demand of major OECD countries. These economies still remain mainly wage-led after including financial control variables.

3.3 Data and estimation strategy

We estimate our model with quarterly data obtained from Eurostat, for the period 1995–2017. The main objective of using quarterly data is to increase the size of our sample in order to better evaluate the internal devaluation policy followed during the period 2009–17. Other authors have also used quarterly data in order to explicitly focus on a short-term analysis (Stockhammer and Stehrer, 2011).

We use the following variables for the econometric estimations: GDP (Y), household consumption (C), private gross fixed capital formation (I), adjusted employee compensation (W),[4] adjusted operating surplus (R), profit share (π), nominal unit labour costs (ULC), exports (X), imports (M), price of exports (Px), import prices

[4] Adjusted wages are calculated as real compensation per employee multiplied by total employment. The unadjusted share of labour compensation in GDP underestimates the labour share, since part of the mixed income is remuneration of the self-employed.

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Table 2. *A summary of the literature on the demand regimes in developed economies*

	Domestic demand		Total demand	
	Wage-led	**Profit-led**	**Wage-led**	**Profit-led**
Euro area	Onaran and Galanis (2012), Stockhammer *et al.* (2009)		Onaran and Galanis (2012), Stockhammer *et al.* (2009)	
Germany	Onaran and Galanis (2012) Stockhammer *et al.* (2011), Stockhammer and Stehrer (2011), Bowles and Boyer (1995), Naastepad and Storm (2006), Hein and Vogel (2008)		Onaran and Galanis (2012), Stockhammer *et al.* (2011), Naastepad and Storm (2006), Hein and Vogel (2008), Onaran and Obst (2016)	Bowles and Boyer (1995)
France	Onaran and Galanis (2012), Bowles and Boyer (1995), Naastepad and Storm (2006), Ederer and Stockhammer (2007), Hein and Vogel (2008), Stockhammer and Stehrer (2011)		Onaran and Galanis (2012), Naastepad and Storm (2006), Hein and Vogel (2008), Onaran and Obst (2016)	Bowles and Boyer (1995), Ederer and Stockhammer (2007)
Italy	Onaran and Galanis (2012), Naastepad and Storm (2006)		Onaran and Galanis (2012), Naastepad and Storm (2006)	
NL	Naastepad and Storm (2006), Stockhammer and Stehrer (2011), Onaran and Obst (2016)	Hein and Vogel (2008)	Naastepad and Storm (2006), Onaran and Obst (2016)	Hein and Vogel (2008)
Austria	Stockhammer and Ederer (2008) Hein and Vogel (2008), Stockhammer and Stehrer (2011), Onaran and Obst (2016)			Stockhammer and Ederer (2008), Hein and Vogel (2008), Onaran and Obst (2016)
UK	Onaran and Galanis (2012) Bowles and Boyer (1995), Naastepad and Storm (2006), Hein and Vogel (2008), Onaran and Obst (2016)	Stockhammer and Stehrer (2011)	Onaran and Galanis (2012), Bowles and Boyer (1995), Naastepad and Storm (2006), Hein and Vogel (2008), Onaran and Obst (2016)	
US	Onaran and Galanis (2012), Onaran *et al.* (2011), Bowles and Boyer (1995), Hein and Vogel (2008), Stockhammer and Stehrer (2011)	Naastepad and Storm (2006)	Onaran and Galanis (2012), Onaran *et al.* (2011), Bowles and Boyer (1995), Hein and Vogel (2008)	Naastepad and Storm (2006), Diallo *et al.*(2011)
Japan	Onaran and Galanis (2012), Bowles and Boyer (1995), Stockhammer and Stehrer (2011)	Naastepad and Storm (2006)	Onaran and Galanis (2012)	Bowles and Boyer (1995), Naastepad and Storm (2006)
OECD-Panel	Hartwig (2014), Stockhammer and Wildauer (2016)		Hartwig (2014), Stockhammer and Wildauer (2016)	Kiefer and Rada (2015)
Spain	Naastepad and Storm (2006), Onaran and Obst (2016)		Naastepad and Storm (2006), Onaran and Obst (2016)	

Source: Onaran and Galanis (2012); Stockhammer (2015); author's elaboration.

(Pm), total GDP of OECD countries (YW), household debt (Dh), corporate debt (Dc), household debt-to-GDP ratio (DhY) and private debt-to-GDP ratio (DpY). Definitions and statistical sources are provided in Table A1 in Appendix 1.

We apply a single-equation approach, widely used in the literature, estimating a different function for each component of aggregate demand and assuming functional income distribution to be exogenous. This approach is preferred to other possible methodologies, such as using vector autoregression (VAR) models, since it allows us to isolate the partial effects on each component of aggregate demand.

ADF tests suggest that most variables are non-stationary. In order to avoid the risk of spurious correlations, we transform our series using the fourth difference of the logarithm. Since we are working with quarterly data, we do not take the first difference with the previous quarter, but with the equivalent quarter of the previous year.[5] Hence, the estimated coefficients are elasticities. For those variables with no presence of unit roots in the Dickey-Fuller test (profit share, household debt-to-GDP ratio and private debt-to-GDP ratio), the fourth difference need not be taken, and only the logarithmic transformation is used. The Engle-Granger test failed to provide evidence of cointegration.

To check for the possible existence of autocorrelation, we apply the Breusch-Godfrey test. When autocorrelation is detected, we add an autoregressive term AR (1) to the equation, and use the coefficients resulting from the Cochrane-Orcutt estimations. We use robust estimators of the standard errors when heteroskedasticity is detected.

Since we are interested in the marginal effects of a change in the wage share, we transform the elasticities obtained using the current values of our sample. The variables estimated are kept in the reported specifications even when they are not statistically significant (although they are computed, in these cases, as null variables when calculating the marginal effects).

Specifically, we have estimated the following six equations:

Consumption function:

$$dlogC_t = \beta_0 + \beta_W dlogW_t + \beta_R dlogR_t + \beta_{Dh} dlogDh_t + \beta_{DhY} logDhY_t \quad (6)$$

Investment function:

$$dlogI_t = \propto_0 + \propto_Y dlogY_t + \propto_\pi log(\pi)_{t-1} + dlogDh_t + \propto_{Dc} dlogDc_t + \propto_{DpY} logDpY_t \quad (7)$$

$$\text{Domestic price function: } dlogP_t = a + b_1\, dlogULC + b_2\, dlogPM \quad (8)$$

$$\text{Export price function: } dlogPX_t = a + b_1\, dlogULC + b_2\, dlogPM \quad (9)$$

[5] For a more detailed analysis on this issue, when using quarterly data, see Stockhammer and Stehrer (2011).

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$$\text{Exports function: } dlogX_t = x_0 + x_1\, dlogYW + x_2\, dlog(PX / PM) \tag{10}$$

$$\text{Imports function: } dlogM_t = m_0 + m_1\, dlogY + m_2\, dlog(PX / PM)_{t-1} \tag{11}$$

The results of our estimates are presented below in Table 3. We divide our analysis into two periods: first, we analyse the sample as a whole (1995–2017). Second, we focus on the period of internal devaluation (2009–17).

3.4 Results

We analyse in this section the results of our estimates. We also compare, in Table 4, our results with those obtained by Onaran and Obst (2016) and Naastepad and Storm (2006), the only two papers in the literature reporting estimations for Spain (as a part of a country-group study). These authors don't extend, however, the Bhaduri-Marglin model to include financial variables.

In the consumption function, the elasticity of consumption with respect to an increase in wages is positive (0.39) and statistically significant. In contrast, the effect of profit income on consumption is not statistically significant. This happens for the whole sample, and also occurs for the period 2009–17. Thus, a rise in the wage share positively affects consumption.

The effect of debt on consumption is as expected: changes in household net debt (dlogDh) have a positive impact on consumption growth, with a statistically significant elasticity of 0.16. This result is stronger for the period 2009–17, with a higher elasticity (0.59), showing the expected effect of over-leverage during a balance sheet recession: the deleveraging dynamics leads to reducing household consumption. These results for changes in household debt are consistent with the outcomes reported in similar studies for other countries (Stockhammer and Wildauer, 2016). Nevertheless, our model does not capture the expected negative effect of the debt-to-income ratio on consumption.

With respect to investment, the positive relationship predicted between income (Y, as a proxy of expected demand) and private investment is strong (above 3.0) and clearly significant in the two periods analysed. In fact, changes in aggregate demand are the main driver of gross fixed capital formation.

To estimate the effect of a pro-capital distribution on investment, we use the first lag of the profit share ratio (π), as is often done in the literature. This indicator is the one that works best among the different proxies tried. Nevertheless, the link between profitability and investment is less clear. For the sample as a whole, we obtain a positive coefficient (0.41), although it is necessary to increase the significance threshold to 10% in order to consider this effect.[6] When analysing the sub-period of internal devaluation, the coefficient of $log(\pi)_{t-1}$ is not significant even at the 10% statistical level, reflecting a breakdown of the profit-investment nexus.

With regard to the effect of private debt on investment, some, but not all, of our initial hypotheses are confirmed. And others must be reformulated. Household net debt

[6] Naastepad and Storm (2006) explain the low intensity of the profit-investment nexus as a typical pattern of "coordinated market economies" (according to the Varieties of Capitalism approach). In these economies, since they rely on bank-based financial systems, profitability is less important for investment than in 'liberal market economies'.

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Table 3. *Regression results*

	1995–2017						2009–17					
	CONSUM	INVEST	NAC PRICE	EXPORT PRICE	XPORT	IMPORT	CONSUM	INVEST	NAC PRICE	EXPORT PRICE	XPORT	IMPORT
dlogW	0.3852****						0.4380****					
	–0.0904						*–0.1151*					
dlogR	0.0797						0.0199					
	–0.0504						*–0.0862*					
logDhY	–0.0431						–0.0604					
	–0.0365						*–0.0493*					
dlogDh	0.1578*	1.4264***					0.5890***	4.8950****				
	–0.0813	*–0.4451*					*–0.204*	*–0.8881*				
dlogY		3.1740****				3.7015****		3.0653****				2.1454****
		–0.7304				*–0.4947*		*–0.7663*				*–0.4908*
logπ(t-1)		0.4062*						0.7155				
		–0.2298						*–0.4755*				
dlogDc		–0.084						0.1271				
		–0.2092						*–0.2365*				
logDpY		–0.0518						0.6326**				
		–0.1795						*–0.2319*				
dlogULC			0.1466****	0.0839					0.1130****	–0.0451		
			–0.0401	*–0.0869*					*–0.0312*	*–0.1311*		
dlogPM			0.0239	0.4375****					0.0051	0.4237****		
			–0.026	*–0.0337*					*–0.0169*	*–0.0586*		
dlogYW					2.6481****						2.6574****	
					–0.2524						*–0.4791*	
dlogPXPM					–0.213						–0.0562	
					–0.1373						*–0.2179*	
dlogPXPM(t-1)						0.4829**						0.3579
						–0.2029						*–0.2902*
N	71	70	87	87	87	86	34	34	35	35	35	35
r2	0.3452	0.5137	0.0747	0.6776	0.5487	0.4152	0.6216	0.694	0.217	0.7377	0.551	0.3347
F	8.6999	8.7103	7.552	84.5384	103.471	29.4629	11.9121	7.6982	6.6823	27.0257	39.4208	9.6832
pvalue	0.0232	0.0113	0.1238	0.0118	0.0096	0.0334	0.0133	0.0157	0.1384	0.0363	0.025	0.0978
ll	244.8401	154.2981	325.254	303.0497	212.705	183.4916	120.2884	79.1673	156.5262	122.4309	90.9899	74.5882
rho	0.8695	0.9734	0.8667	0.6459	0.6618	0.8801	0.7024	0.9076	0.679	0.5117	0.58	0.6727

Standard errors in italics: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$, ****$p < 0.001$
Source: Author's calculations, based on Eurostat quarterly data.

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Table 4. *Results of the Bhaduri-Marglin model for the case of Spain*

	Consumption	Investment	Domestic and export prices	Net exports	Regime
Naastepad and Storm (2006) **Period: 1964–2000**	-A rise in W/Y affects C strongly and positively	-A rise in W/Y affects I negatively -Demand has a significant effect on I, with an impact larger than 1 -The effect of profitability on I is weakly significant		-Exports depend positively and intensely on demand from other OECD countries -Effect of ULC/prices is significant on exports, although modest -Income elasticity of exports is greater than price elasticity	Wage-led
Onaran and Obst (2016) **Period: 1961–2013**	-A rise in W/Y affects C strongly and positively -The effect of profits on C is significant, but smaller than the effect of wages	-A rise in W/Y affects I negatively -The main driver of I is demand (income), with an impact larger than 1 -The effect of profitability on I is significant, but smaller than the effect of income -There's a breakdown of the profit-investment nexus since the Great Recession	-Impact of ULC on domestic prices is significant and positive -Impact of ULC on export prices is significant and positive, although the main determinant of export prices is import prices	-Exports depend positively and intensely on demand from other OECD countries -Effect of ULC/prices is significant on exports, although modest -Income elasticity of exports is greater than price elasticity -Domestic demand is the main driver of imports, with prices being significant	Wage-led
Alvarez *et al.* (2018) Period: 1995–2017 & 2009–17	-A rise in W/Y affects C strongly and positively -The effect of profits on C is not statistically significant -Household debt has a positive impact on C. This effect is reinforced in a balance sheet recession, although in opposite direction: deleveraging dynamics are linked to strong reductions in consumption	-A rise in W/Y affects I negatively -The main driver of I is demand (income), with an impact larger than 1 -The effect of profitability on I is weakly significant, and smaller than the effect of income -There's a breakdown of the profit-investment nexus since the Great Recession -Household debt has a positive impact on I (thought mortgage debt and residential investment). In a balance sheet recession, over-indebtedness and deleveraging retract investment	-Impact of ULC on domestic prices is significant and positive -ULC are not statistically significant in the export price function -The main determinant of export prices is import prices	-Exports depend positively and intensely on demand from other OECD countries -Effect of ULC/prices is not significant on exports -Income elasticity of exports is greater than price elasticity - No export-led recovery in 2014–17: the fall in ULC is not transferred to export prices, and OECD demand is the main driver of exports - Domestic demand is the main driver of imports, with prices being significant	Wage-led

Source: Author's elaboration.

growth (dlogDh)—mainly, mortgage debt—is an important determinant of investment growth for the whole sample, as expected, since a large part of private investment in Spain before the crisis was residential investment. On the other hand, neither corporate net debt growth (dlogDc) nor the stock effect of private debt (logDpY) show significant coefficients for the whole sample.

However, the analysis of the second period (2009–17) is particularly interesting regarding the link between debt and investment. First, we see how the elasticity of household net debt on investment is reinforced (from 1.43 to 4.89). But also, we observe how the private debt-to-income ratio (logDpY) becomes a significant variable after the crisis, although with a positive sign and not negative as we initially expected. From our point of view, these two results point to the particularity that periods of balance sheet recession and deleveraging entail: rapid reductions in net debt flows lead to reductions in debt-to-income ratios and, also, to parallel reductions in investment, with the three variables contracting simultaneously.

In Table 3, we can see how ULC are positive and significant when explaining domestic prices for the two periods studied. Nevertheless, a coefficient of 0.11 (clearly below 1) for the period 2009–17 is consistent with the outcomes of Section 2.2 (Figure 3): the reduction in ULC has been only partially transferred into a reduction of the GDP deflator.

The link is even weaker with export prices: ULC are not statistically significant in the export price function. This is also consistent with the empirics of Figure 4: a reduction in ULC does not necessarily imply improved price competitiveness. As can be seen in Table 3, the main determinant of export prices is import prices.[7]

The export and import functions include, respectively, the income of the remaining OECD countries (YW), national income (Y), as well as the ratio between export prices (PX) and import prices (PM). The coefficients of these functions have the expected signs. Exports depend positively and intensely on the rest of the world's income, and negatively on relative prices. However, the coefficient of prices is not statistically significant in either of the two periods. That is to say, cost competitiveness matters for the export performance, but in a modest way, since income elasticity of exports is much larger than price elasticity. Again, this is consistent with the stylized facts seen in Section 2.2 (Table 1): export growth, as well as the export market share, are very similar before and after the crisis, despite the important change in ULC. In fact, export market share is even lower.

Export growth during the internal devaluation period is not driven by prices, but by the economic growth of the rest of OECD countries. This is the main determinant of the recovery of exports after the crisis. Even mainstream authors and institutions who are enthusiastic about internal devaluation (Bank of Spain, 2016) obtain similar results: price competitiveness only modestly explains the evolution of exports.

The behaviour of the import function is similar, and the sign of the coefficients is as expected. Domestic income has a significant effect and is the main driver of imports. The elasticity of prices is significant, although it is much lower.

[7] It should be noted here that the amount of intermediate goods imported by the Spanish economy is relatively high. The import content of Spanish exports is 39%, according to the Bank of Spain (2012, p. 89).

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Table 5. *Marginal effect on C/Y of a 1% increase in the W/Y ratio*

	C	W	R	β_W	β_R	c_W	c_R	$c_W - c_R$
1995–2017	137,320.6	138,495.7	81,877.15	0.385	0.000	0.382	0.000	0.382
2009–17	146,733	150,016.5	92,864.85	0.438	0.000	0.428	0.000	0.428

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

Table 6. *Marginal effect on I/Y of a 1% increase in the W/Y ratio*

	I	π	Y	α_π	$-\alpha_\pi(I/\pi)\ (1/Y)$
1995–2017	53,764.69	0.374	255,738.6	0.406	–0.228
2009–17	47,759.01	0.382	267,859.2	0.000	0.000

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

4. Effects of internal devaluation policy on economic growth

To estimate the outcomes of internal devaluation policy on economic growth, we calculate the marginal effects of a change in functional income distribution. Elasticities are converted into marginal effects at the mean of our sample, multiplying the estimated coefficients by the actual values of consumption, investment, wages, profits, exports and imports. We compute the global marginal effect as noted in equation (2):[8]

$$\begin{aligned}\frac{\partial Y}{\partial \Omega} &= \frac{1}{1-\left(\frac{\partial C}{\partial Y}+\frac{\partial I}{\partial Y}+\frac{\partial NX}{\partial Y}\right)}\left(\frac{\partial C/Y}{\partial \Omega}+\frac{\partial I/Y}{\partial \Omega}+\frac{\partial NX/Y}{\partial \Omega}\right)\\ &= \mu\left(\frac{\partial C/Y}{\partial \Omega}+\frac{\partial I/Y}{\partial \Omega}+\frac{\partial NX/Y}{\partial \Omega}\right)\end{aligned} \tag{2}$$

The difference in the marginal propensity to consume out of wages and profits determines the effect on consumption of a change in income distribution. Table 5 shows this difference ($c_W - c_R$):

Estimated elasticity of investment with respect to the wage share is shown in Table 6:

Finally, estimated elasticity of exports and imports with respect to the wage share is given by a long chain of linked elasticities. This chain of elasticities goes from real ULC to exports and imports, with prices being the variable that allows such a connection. Estimated elasticity of exports and imports are shown in Table 7. Its value is null because the corresponding coefficients have not proven significant in the previous estimations.

Adding the marginal effects of consumption, investment and net exports, we can measure the total effect of a percentage point increase in the wage share on private

[8] The specific calculations of the elasticity of consumption, investment and net exports with respect to the wage share can be sent upon request.

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Table 7. *Marginal effect on XN/Y of a 1% increase in the W/Y ratio*

	Elasticity of P with respect to ULC	Elasticity of ULC with respect to Ω	Elasticity of PX with respect to ULC	Elasticity of X with respect to PX	Elasticity of X with respect toΩ	Elasticity of M with respect to PX	Elasticity of M with respect to Ω	Imports associated with each unit exported	Inverse of wage share on a given date (2017q4)	Weight of exports, on the same date (2017q4)	Weight of imports, on the same date (2017q4)	Partial effect of a 1% increase in wage share on X/Y	Partial effect of a 1% increase in wage share on M/Y	Partial effect of a 1% increase in wage share on XN/Y
	e P - CLU	e CLU-Ω	e PX-CLU	e X-PX	e X-Ω	e M-PX	e M-Ω	Content M of X	1/Ω	X/Y	M/Y	(δX/Y) / δΩ	(δM/Y) / δΩ	(δXN/Y) / δΩ
1995–2017	0.147	1.172	0.000	0.000	0.000	0.483	0.000	0.390	1.661	0.326	0.284	0.000	0.000	0.000
2009–17	0.113	1.127	0.000	0.000	0.000	0.000	0.000	0.390	1.661	0.326	0.284	0.000	0.000	0.000

Note: The import content of Spanish exports is 39% according to the Bank of Spain (2012, p. 89).
Source: Author's calculations, based on Eurostat quarterly data.

Table 8. *Total effect on demand of a 1% increase in the W/Y ratio*

	Partial effect of a 1% increase in wage share on C/Y	Partial effect of a 1% increase in wage share on I/Y	Partial effect of a 1% increase in the wage share on XN/Y	μ	Total effect
	A	B	C	D	D(A+B+C)
1995–2017	0.382	-0.228	0.000	0.940	0.145
2009–17	0.428	0.000	0.000	1.300	0.557

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

demand. However, as income is also an explanatory variable in these equations, we also obtain an estimate of the implicit multiplier (μ, in equation (2)).[9] The ultimate effect on the economy will be the product of this multiplier for the above effect (Table 8). If positive, the economy is wage-led, and if negative, the economy is profit-led.

As we see, the Spanish economy is a wage-led economy. The effect of a 1-percentage-point increase in the wage share in Spain entails an expansionary effect of 0.6 points in aggregate demand for the period 2009–17.

The average value of the wage share for the period before internal devaluation was 3 percentage points above its value at the end of 2017 (Figure 1). That is to say, the wage share fell by 0.33 points each year in the period 2009–17. This means that every year the economy lost 0.2 percentage points of potential growth as a consequence of the internal devaluation policy.

Nastepaad and Storm (2006) also find the Spanish economy to be wage-led for the period 1960–2000, and Onaran and Obst (2016) present very similar figures for the Spanish case (in their study, the effect of a 1-percentage-point increase in the profit share in Spain entails a reduction of –0.5 points in aggregate demand).

The results of our estimates show that, compared to the whole sample, the wage-led character of the economy is reinforced during the period 2009–17, as a result of two factors.

First, the implicit multiplier becomes larger in the period of the crisis (see Table A2, Appendix 2), as expected by Keynesian literature (Auerbach and Gorodnichenko, 2012; Gerchert and Rannenberg, 2014). This is the result of different factors operating simultaneously in the context of a slack economy, such as the abundance of idle resources, the paradox of thrift and potential crowding-in effects.

Second, the wage-led character is also reinforced for the period 2009–17 due to the partial disconnect between profits and private investment already mentioned. This partial disconnect present in our estimates can be observed in Figure 6 too, which correlates the evolution of the gross operating rate and gross fixed capital formation for the main NACE branches of the Spanish economy. In an economy such as Spain's, where the private sector has high debt ratios, wage devaluation policies serve to increase profit margins and deleverage, but fail to foster investment in equal measure.[10]

[9] For further details on calculating the implicit multiplier, see Appendix 2.

[10] The breakdown of the profit-investment nexus is explained by an additional factor. Private investment is a combination of equipment for companies and housebuilding for accommodation. Given the size and instability of housing investments during the considered period, the disconnect between profits and investment is not surprising.

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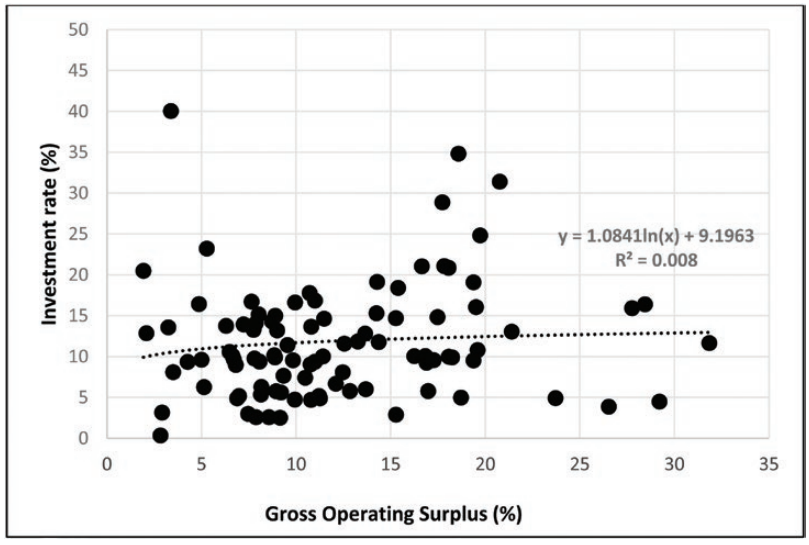

Fig. 6. *Gross Operating Rate (%) vs. Investment Rate (%). NACE aggregates of activities (2009–15), Spain*

**Note:* Gross Operating Rate, on the X axis, is defined as Gross operating surplus/turnover. Investment Rate, on the Y axis, is defined as gross fixed capital formation/value added at factors cost. In both cases, we take the average value for the period 2009–15.

Source: Eurostat and author's calculations.

5. Main conclusions and policy implications

This paper presents three contributions to the Bhaduri-Marglin literature. First, we developed the first in-depth study for the Spanish economy, and one of the few that addresses the case of a Eurozone peripheral economy. Second, we use the Bhaduri-Marglin model to assess an economic policy: the relevance of internal devaluation. And third, we expand the Bhaduri-Marglin model to include also financial variables.

Our estimates confirm that the Spanish economy is a wage-led economy. This result is analogous to those obtained by many other studies that follow the Bhaduri-Marglin approach to analysing large Eurozone economies.

Labour market reforms legislated in Spain during the crisis imposed wage devaluation, but did not transform the wage-led character of the economy. As a consequence, Spain lost an average of 0.2 percentage points of GDP growth per year between 2009 and 2017.

This result is due to four specific factors, which are the main findings of our research:

1. The marginal propensity to consume out of wage income is invariably larger than the marginal propensity to consume out of capital income. Thus, a pro-capital income distribution reduces aggregate consumption.
2. Profitability has a weak impact when it comes to explaining private investment in the analysed period; investment is more influenced by the evolution of income and the subsequent accelerator effect. As internal devaluation reduces domestic demand, the net effect also proved detrimental to private investment during 2009–17.

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3. ULC are a significant determinant of domestic prices. However, ULC are not significant when explaining export prices and net exports. The economic growth of major trading partners is far more relevant vis-à-vis explaining exports than the change in relative prices.
4. The implicit multiplier increases during recession, and becomes larger than 1.

All these results, coherent with the Bhaduri-Marglin literature, are maintained after having extended the model to include financial variables. Robust and positive effects of household net debt on consumption and investment are reported for the whole period, and also for the period 2009–17. When the economic cycle changes and the Spanish economy enters a balance sheet recession, the dynamics of private deleveraging leads to a reduction in consumption and investment.

Excessive private indebtedness—captured by the private debt-to-income ratio (logDpY), and statistically significant—helps explain the partial disconnect between profits and investment, since the former must be used by companies to deleverage. This breakdown of the profit-investment nexus, together with the increase of the implicit multiplier, explain the reinforcement of the wage-led character of the Spanish economy in 2009–17.

Our results point to three important policy implications that should be taken into account in current debates.

First, it cannot be said that internal devaluation in Spain triggered an export-led recovery in recent years. Our findings do not support this idea: during the period of 2009–17, the fall in ULC has not been transferred to export prices, economic growth of OECD countries (and not wage devaluation) has been the main driver of exports, and export growth remains similar to that of the period 1995–2007.

Some relevant variables in our study were not significant for the period of internal devaluation: profitability as a determinant of investment, or ULC as drivers of exports. These variables would probably be significant for a longer period of analysis, as many studies have shown. In any case, these results point to the weak capacity of these factors—wage devaluation, ULC and profitability—to explain Spain's recovery since 2015. By contrast, the recovery is best explained by looking at other determinants, such as the depreciation of the euro, falling energy prices, the ECB's quantitative easing policy and a certain abandonment of fiscal austerity.

Second, there is no need to 'pay a fee'—in terms of increasing income inequality—to boost economic growth and leave the crisis behind. On the contrary, a pro-labour distribution would not only reduce inequalities, but would also reinforce aggregate consumption, demand for investment through the accelerator effect and, therefore, economic growth.

And, third, the increase in the value of the implicit multiplier during the crisis—clearly above 1—entails a greater potential effectiveness of both fiscal and income distribution policies.

For all this, it is time to re-examine the rationality of pro-capital distributional policies, and to develop an alternative policy mix based on pro-labour distributional policies in order to follow a wage-led growth strategy (Lavoie and Stockhammer, 2013). It is crucial to bring an end to austerity and to support demand at the EU level, and not to extend internal devaluation to other member countries. In addition, this might be accompanied by measures favouring the restructuring of certain corporate debt so as to facilitate the re-establishment of the profit-investment nexus.

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Appendix 1

Table A1. *Variables, data definitions and sources*

Variable	Full variable name	Units and description	Type	Source	Code
Y	Gross domestic product at market prices	Chain linked volumes (2010), million euros	Seasonally and calendar adjusted data	Eurostat	B1GQ namq_10_gdp
P	GDP deflator	Price index (implicit deflator), 2010 = 100, national currency	Seasonally and calendar adjusted data	Eurostat	PD10_EUR teina110
C	Final consumption expenditure of households	Chain linked volumes (2010), million euros	Seasonally and calendar adjusted data	Eurostat	P31_S14 namq_10_gdp
I	Private gross fixed capital formation	Private sector, Current prices, million euros; deflated by GDP deflator	Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data)	Eurostat	P51G nasq_10_nf_tr
w	Compensation of employees	Current prices, million units of national currency; deflated by GDP deflator	Seasonally and calendar adjusted data	Eurostat	D1 namq_10_gdp
W	Adjusted compensation of employees	Current prices, million units of national currency; deflated by GDP deflator	Seasonally and calendar adjusted data	Calculated as w* (Employment/ employees)	
r	Operating surplus and mixed income, gross	Current prices, million units of national currency; deflated by GDP deflator	Seasonally and calendar adjusted data	Eurostat	B2A3G namq_10_gdp
R	Adjusted profit	Current prices, million units of national currency; deflated by GDP deflator	Seasonally and calendar adjusted data	Calculated as Y-W	
Ω	Adjusted wage share	%		Calculated as W/Y	
π	Adjusted profit share	%		Calculated as R/Y	
ULC	Nominal unit labour cost based on persons	Index, 2010 = 100	Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data)	Eurostat	NULC_PER namq_10_lp_ulc

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Table A1. *Continued*

Variable	Full variable name	Units and description	Type	Source	Code
X	Exports of goods and services	Chain linked volumes (2010), million euros	Seasonally and calendar adjusted data	Eurostat	P6 namq_10_gdp
M	Imports of goods and services	Chain linked volumes (2010), million euros	Seasonally and calendar adjusted data	Eurostat	P7 namq_10_gdp
PX	Price of exports of goods and services	Price index (implicit deflator), 2010 = 100, national currency	Seasonally and calendar adjusted data	Eurostat	namq_10_gdp
PM	Price of imports of goods and services	Price index (implicit deflator), 2010 = 100, national currency	Seasonally and calendar adjusted data	Eurostat	namq_10_gdp
YW	GDP, volumes, OECD total	Index, 2010 = 100		OECD Economic Outlook, 101, June 2017	VIXOBSA
Dh	Household debt	Liabilities (loans), households, million euros, deflated by GDP deflator	Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data)	Eurostat	LIAB F4 nasq_10_f_bs
Dc	Corporate debt	Liabilities (loans and debt securities), non-financial and financial corporations, million euros, deflated by GDP deflator	Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data)	Eurostat	LIAB F3 and F4 nasq_10_f_bs
DhY	Household debt-to-GDP ratio	%		Calculated as Dh/Y	
DpY	Private debt-to-GDP ratio	%		Calculated as (Dh+Dc)/Y	

Note: All the variables are deflated by the GDP deflator, or by its corresponding deflator in the case of exports and imports. Income of OECD countries is deflated by their own GDP deflators.

Appendix 2. Calculating the multiplier

The marginal effects on consumption, investment and net exports due to an increase in the wage share do not take place with a constant level of income, but with second-round effects, resulting in the well-known multiplier effect.

The multiplier (μ) is given by an expression in which these three effects are taken into account, and which depends on the coefficients that we have already estimated:

$$\mu = \frac{1}{1-\left(\frac{\partial C}{\partial Y}+\frac{\partial I}{\partial Y}+\frac{\partial XN}{\partial Y}\right)} = \frac{1}{1-\left(c_W\Omega + c_R\left(1-\Omega\right)+\alpha_Y\frac{I}{Y}-m_1\frac{M}{Y}\right)} \tag{12}$$

In Table A2, we present the calculation of the multiplier. For this calculation, we use the mean values of the sample for the corresponding period.

Table A2. *Calculation of the multiplier, Spain*

	Ω	cW	cR	αY	m1	I/Y	M/Y	cW* Ω	cR * (1-Ω)	βY * I/Y	m1 * M/Y	μ
1995–2017	0.630	0.382	0.000	3.174	3.702	0.211	0.262	0.24	0.00	0.67	0.97	0.94
2009–17	0.618	0.428	0.000	3.065	2.145	0.178	0.271	0.26	0.00	0.55	0.58	1.30

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

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