The role of internal devaluation on the correction of the Spanish external sector

Paloma Villanueva (Instituto Complutense de Estudios Internacionales)

Luis Cárdenas (University Isabel I)

Jorge Uxó (University of Castilla-La Mancha)

Ignacio Álvarez (Autonomous University of Madrid)

The Spanish economy has been one of the EU's most affected by the Great Recession of 2008, recording a rate of unemployment of 24.4% in 2014. However, since 2015 the Spanish economy is growing faster than most Euro Area countries, reaching an annual growth rate over 3% during the period 2015-2017. Moreover, it has turned its historical current account deficit, which peaked in 2007, into a trade surplus of 2 % of GDP in 2016. International Institutions as well as the Spanish Government have rooted this readjustment of the current account in the "internal devaluation strategy". Consisting of the reduction of wages, this strategy is supposed to have boosted exports and therefore Spanish economic activity, through the reversion of the accumulated loss of price-competitivity since the creation of the European Monetary Union. Based on an extended version of the Bhaduri-Marglin model, which enables the disentangling of the price effect from the demand effect, this paper sheds light on the process occurred in the Spanish external sector and reveals that the internal devaluation strategy affected only the imports-side and had no effect on the exports performance.

JEL classification: E12, E25, E64, F32

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Paloma Villanueva, Luis Cárdenas, Jorge Uxó and Ignacio Álvarez

1. Introduction

Since the onset of the Great Recession, most governments in peripheral countries have adopted the so-called internal/wage devaluation strategy. This policy, which has been applied in Spain from 2010 onwards, is grounded on the following arguments.

On the one hand, a gain in price-competitiveness (internal competitiveness) is said to correct current account imbalances. In a constellation without a monetary union, current account imbalances can be temporarily reduced by decreasing exchange rates, thus applying a nominal devaluation strategy. Yet, with the creation of the European Monetary Union and the higher external imbalances between core and periphery it entailed, this policy is no longer applicable. As a consequence, EU Institutions forced country members to implement internal devaluation strategies, based on reductions of unit labour costs as the only means to recover from the accumulated price-competitiveness loss and to readjust their balance of payments. On the other hand, international institutions have also posited that in a scenario with fiscal austerity measures and a domestic demand shortfall, a cut in unit labour costs induces a change in the model of growth of an economy, namely to an export-led model. That implying that the effect of the unit labour costs cut on exports offsets that of austerity measures on domestic demand and its shortfall and that substitution of imports takes place.

A quick look over the macroeconomic figures for Spain could mislead to a corroboration of the above-mentioned arguments. 2007 registered the highest trade deficit in goods and services ever (-6% of GDP). However, this balance has experienced a sustained reduction and turned into a trade surplus in 2012 (1.5% of GDP). From then on, the Spanish economy has managed to maintain a trade surplus of around of 2-3% GDP until today. At the same time, the international community interprets the Spanish case as a successful one, being its real annual growth rate among the highest of the European Union (3.2% on average in the biennium 2015-2016), and outrunning other peripheral countries also.

This analysis, as long as it focuses solely on the balance of trade/net exports, hides the recent behaviour of both imports and exports after the implementation of the internal devaluation strategy. In this paper, we aim to explain how the internal devaluation has had an impact on both these variables with the Bhaduri-Marglin approach, thus assessing the actual evolution of the balance of trade in goods and services. We will show that in the Spanish economy, the effects of unit labour costs cuts on domestic demand and hence on imports outweigh that on exports.

[1] First draft, prepared for its presentation in the Conference "The crisis of globalization", organized by the Forum For Macroeconomics and Macroeconomic Policies (IMK, Hans-Böckler-Stiftung) in Berlin, November 2017. Please, do not quote or cite.

Our contribution to the debate, which consists of the introduction of the import component of the balance of trade and putting to work the Bhaduri-Marglin model as a means to evaluate policies on the external sector, should draw a more appropriate picture on the role of the internal devaluation strategy on the late Spanish external sector performance.

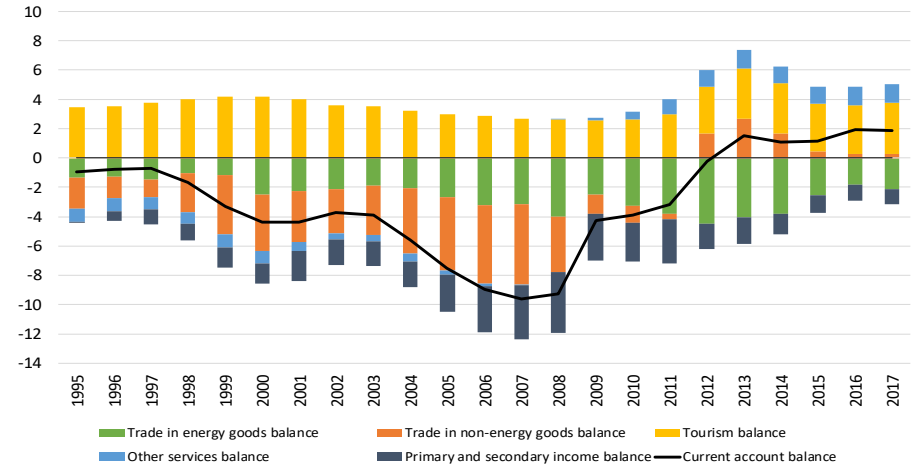
The paper is organized as follows. Section 2 will present a detailed description of the evolution of the external sector, in order to properly capture its long-term characteristics. Attention will be paid to its components, its contribution to GDP growth and the changes on the geographical breakdown of exports. Section 3 will introduce the theoretical approach and present the Bhaduri-Marglin model. Section 4 presents the data and the estimation techniques employed to account for the elasticities of unit labour costs to the main GDP aggregates. Section 5 reports the results from the estimation model run and explain the final effect of of the internal evaluation strategy on the correction of the external sector imbalance. Finally, the last section will draw the conclusions.

2. The recent evolution of the Spanish current account

The current account consists of four balances: the trade balance, which accounts for export and imports of goods, the services balance, which refers to revenue and payments from tourism and exchanges in "other services", and the primary and secondary income accounts, that record financial flows stemming from various transactions (income flows and transfers).

In Spain, the current account balance has gone through a readjustment of 11.6 pp of GDP since the beginning of the crisis, turning a deficit of a -9.6% of GDP to a current account surplus of 2% of GDP in 2016 (Figure 1). According to Balance of Payments data, 9 pp of the variation was due to the evolution of the balance of goods and services. Although all of the current account components have contributed positively to this correction, the behaviour of the non-energy goods balance stands out. This component alone is responsible for a correction of 5.7 pp. The remaining components helped reduce the deficit to a lesser extent; energy goods and "other services" balances were both cut in 1.3 pp of GDP. Lastly, tourism increased its surplus in 0.6 pp of GDP.

Figure 1: Decomposition of Spanish current account, as % of GDP



Source: Bank of Spain and Custom Data. Author's own calculation

To properly illustrate the changes occurred in the Spanish external sector, it is necessary to focus on the goods and services balance, being it the most important component of the current account, and dividing the readjustment process into three distinguished periods, including in the analysis the pre-crisis period, and as a consequence providing a better picture of the external sector.

During the expansionary period (2000-2007), the goods and services account was characterized by a growing deficit, which increased sharply and reached -9% of GDP by the end. As showed in Table 1, the negative evolution of the goods and services balance was driven by non-energy goods (-2.2 pp) followed by tourism (-1.1 pp). The positive variations of the exports of non-energy goods and other services only partially compensated for this deterioration. Turning to imports, these did not have an impact on the goods and services balance. Nevertheless, their components behaved unequally; energy goods and tourism payments increased 0.7 pp and 0.3 pp respectively. Whereas non-energy good and other services fell by -0.6 pp and -0.5 pp.

The period 2007-2013 saw how the goods and services balance improved in 9.3 pp of GDP. Both exports and the import components contributed to this improvement, being the exports at the lead. In fact, the behaviour of exports of non-energy goods increased by 4.6 pp, followed by energy-goods with 0.8 pp and tourism and "other services" with 0.6 pp each. On the imports side, the only component that increased its ratio to GDP was energy-goods, driven to a certain extent by the increase in oil prices during this period and a low price-elasticity of demand.

The last period spans from 2013 until 2016, representing the period that registered positive growth rates since the beginning of the crisis. As in the pre-crisis period, the goods and services balance decreases, though by a much smaller portion (-0.3 pp of GDP). On the exports side, the energy-goods component was the only one that decreased (-0.7 pp). On the imports side, non-energy goods drove the evolution of imports, growing by 3 pp of GDP.

Table 1: Evolution of exports and imports of goods and services in pp of GDP

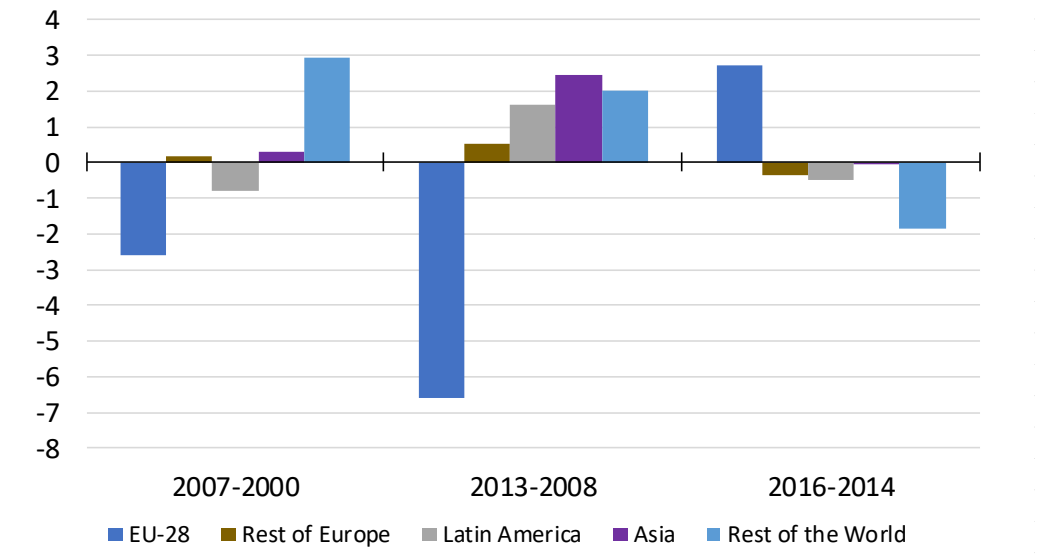
	pp of GDP variations		
	2000-2007	2007-2013	2013-2016
Goods and services balance	-2.9	9.3	-0.3
Exports of goods and services	-2.9	6.5	0.8
____Energy goods	0.1	0.8	-0.7
____Non-energy goods	-2.2	4.6	0.5
____Tourism	-1.1	0.6	0.3
____Other services	0.3	0.6	0.7
Imports of goods and services	0.0	-2.7	1.1
____Energy goods	0.7	1.7	-2.9
____Non-energy goods	-0.6	-3.6	3.0
____Tourism	0.3	-0.1	0.4
____Other services	-0.5	-0.7	0.7

Source: INE, Bank of Spain and Customs Data

Even though Table 1 shows that during the period 2007-2013 exports increased 6.5 pp of GDP, the calculation of the GDP effect provides a clearer picture on the evolution of the balance of goods and services during this period. The GDP effect of exports is calculated by substracting

the exports variation divided by GDP from the total weight change.[2] In fact, the higher growth of exports of goods and services (6.5 pp) and of the goods and services balance (9.3 pp), which took place in the period 2007-2013, was helped by the evolution of GDP (1.5 pp). The readjustment period (2007-2013) correspond with the only one that GDP contributed positively to the net exports to GDP variations.

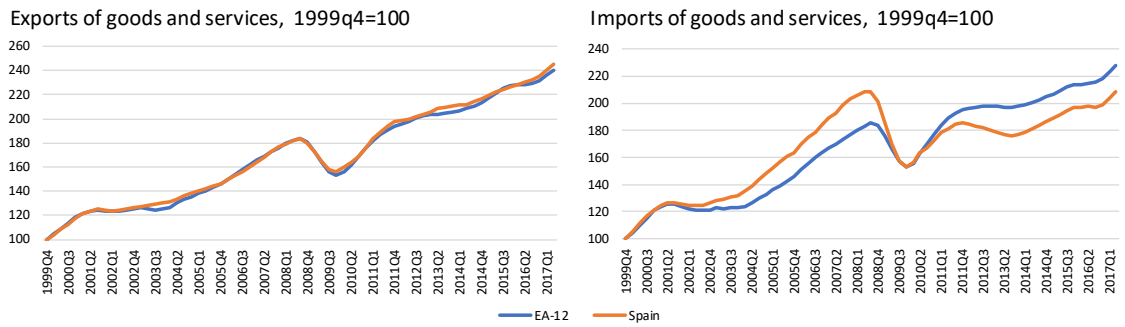
Figure 2: Geographical breakdown of exports of goods, change as a % on total exports



Source: ICEX

Another concern when analysing the external sector readjustment process, is how Spanish exports have been geographically diversified, managing to maintain its world goods export share (1.8% in 2016). Indeed, goods export share to the European Union has fallen by 6.5 pp from 2000 until 2016, as a consequence of the domestic demand shortfall of its main trading partners (UE28 receives 66% of the Spanish exports in 2016). Figure 2 depicts how the Spanish goods exports shares have changed in the analysed periods. Most of this fall occurred during the recession (- 6.6 pp), but it was preceded by a smaller fall during the expansionary period (-2.6 pp). In the last three years, exports have redirected to the European Union, but to a lesser extent (2.7 pp). During the depression period, exports turned to other markets in Asia (2.4 pp) and Latin America (1.6 pp).[3] Despite the price-competitiveness gain of Spanish exports, their geographical reorientation to markets outside the European Union, appears to be a relevant cause explaining

Figure 3: Evolution of the trade and services balance



Source: Eurostat, Current prices, million euro

[2] GDP effect$_t$ = $X_t/GDPt - X_{t-1}/GDP_{t-1} - (X_t-X_{t-1})/GDP_t$

[3] Data from ICEX only take into account exchanges of goods and not of services.

their strength. Furthermore, the export share to the European Union starts increasing in 2014, accompanied by the recovery of the European economies.

With regard to the imports and exports evolution as compared to the Euro Area, exports of goods and services in Spain and the European aggregate are quite similar. Indeed, exports of goods and services after the international trade collapse follow the same trend as in the pre-crisis period. The imports of goods and services, on the contrary, do not behave similarly. Figure 3 demonstrates how imports are growing at a slower pace as in the pre-crisis period, and are diverging from the Euro Area tendency. In line with this fact, we believe the fall in imports growth is mostly responsible for the current account readjustment.

Because of the importance of exports if Spain were to have transited to an export-led model, it is helpful to calculate the contributions to GDP growth for each period. The crisis period had a negative external demand contribution, since the effect of imports exceeded that of exports; growth was clearly driven by domestic demand. In the course of the second period (2008-2013) domestic demand fell and contributed negatively to GDP by -3%. Opposite to this, external demand had a positive contribution to GDP growth, yet exports alone contributed positively to a smaller extent than in the previous period (0.4 % in 2007-2013 vs 1% in 2000-2007). Moreover, the fall on imports explained most of the positive contribution of the external demand. In the last period, despite the higher contribution of exports as compared to the previous period, domestic demand dominated again, while imports recovered.

Table 2: Annual average contributions to real GDP growth

	2001-2007	2008-2013	2014-2016
GDP	3.6%	-1.3%	2.6%
Domestic Demand	4.4%	-3.0%	2.6%
External Demand	-0.9%	1.7%	0.0%
__Exports	1.0%	0.4%	1.4%
__Imports	-1.9%	1.3%	-1.4%

Source: Eurostat

To sum up, the Spanish external sector has been particularly affected by the crisis, mainly by the fall of imports, as a reflection of the domestic demand shortfall, whereas exports have managed, particularly during the depression, to keep their growth pace and to some extent, soften the fall of GDP. The performance of exports during these periods has been rooted by scholars and Institutions in the implementation of the internal devaluation strategy. Nevertheless, net exports clearly show a countercyclical relationship, as its balance becomes more negative when GDP recovers, mainly due to a high import content of both domestic demand and exports.

3. Theoretical approach: using the Bhaduri-Marglin model to measure the impact of internal devaluation on net exports

As nominal devaluations are no longer available inside a monetary union, Eurozone's peripheral countries have implemented since the onset of the crisis different measures to cut down unit labour costs. This "internal devaluation" strategy aims at the restoration of competitiveness vis-à-vis their main partners, trying to solve these countries' current account

imbalances, whilst fostering simultaneously an export-led recovery of GDP growth. For example, the unit labour costs vis-à-vis the Eurozone increased in Spain over 20 pp from 2000q1 until 2008q1, but experienced a reduction of almost the same amount by 2017q2.

The effects of this internal devaluation policy and the correction of the Spanish current account deficit have been widely treated in the recent literature. A strand of the literature has focused on the role of price-competitiveness gains to explain the evolution of exports, and it also considers how their increase could have prevented a deeper depression. However, most of these papers find a rather weak and temporary relationship between competitiveness gains and the performance of exports (Xifré, 2017 and Correa-López and Doménech, 2012). These works defend that non-competitiveness factors, such as an adequate exports structure and firm-level characteristics, are the main cause behind the behaviour of exports. That is, the internal devaluation mechanism does not seem to have had a permanent nor a strong effect on Spanish external competitiveness. Another strand of the literature has focused on the changes leading to the readjustment in the current account balance. Gómez-Loscos and Martín Machuca (2015) study the differences between the last two recessions and the correction of the external sector that took place in both periods. According to them, the competitiveness gains of the last recession have a more permanent nature, because they affected internal costs (unit labour costs) instead of being due to a nominal exchange rate devaluation. Nevertheless, these authors argue that most of the positive external sector contribution to GDP growth is rooted in the fall of imports. Moral and Viani (2017) also devoted their work to the analysis of the permanent or temporary nature of the external sector correction. By employing the External Balance Assessment (EBA), they categorize the explaining factors into cyclical and structural and find that the competitiveness gains are small but have a long-term impact on the readjustment (BdE, 2017).

Our paper differs from the above-mentioned literature both because of its objective and of the methodology we use. The aim of this paper is to evaluate specifically to what extent and through which mechanisms the internal devaluation strategy has been responsible for the readjustment of the Spanish current account, and we use the Bhaduri-Marglin model as the theoretical framework.

To our knowledge, the Bhaduri-Marglin model has not been yet put to work in this way, to explain systematically the effects of the internal devaluation strategy on the external sector, although Hein and Truger (2017) follow a similar way to estimate the effect on intra-Eurozone imbalances of different scenarios, and particularly a more expansionary wage policy in Germany.

This post-kaleckian model is usually used to determine an economy's structural nature, which could be wage-led or profit-led. Capturing the dual characteristic of wages -which are costs for firms and the main source of private consumption simultaneously- these authors study how the changes in functional income distribution affect the different components of aggregate demand (Bhaduri and Marglin, 1990). Accordingly, a wage share increase drives up consumption since the propensity to consume out of wages is higher than that out of profits. Its effect on demand for investment and net exports is ambiguous. Depending on how investment reacts to changes in the rate of profit and on how net exports react to price variations and the demand effect, these effects will offset or not the consumption expansionary effect. We estimate a Bhaduri-Marglin model, but our main interest is to use the results to measure the effect of wage cuts on exports and imports.

Another difference is that the independent variable in the Bhaduri-Marglin model is the wage share (Ω), while internal devaluation is focused on a reduction in unit labour costs (ULC). Nevertheless, changes in ULC would probably affect the wage share in the same direction, because cost reductions are not fully passed-through to prices. Then, a reduction in ULC will probably mean a lower wage share, and vice versa.

Therefore, in order to analyse the impact of internal devaluation on the external adjustment of the Spanish economy, we investigate the marginal the effect of a 1% change in the wage share on net exports (as a percentage of GDP, Y). This, in turn, is the difference between the effect on exports of goods and services (X/Y) and the effect on imports (M/Y):

$$\frac{\Delta^{XN}/_{Y}}{\Delta\Omega} = \frac{\Delta^{X}/_{Y}}{\Delta\Omega} - \frac{\Delta^{M}/_{Y}}{\Delta\Omega} \quad (1)$$

The potential ways through which this wage cut can affect the current account are threefold:

1) "Price-competitiveness of exports": The 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. If the unit labour cost reduction derived from the internal devaluation strategy is at least partially translated into a decrease in the price of exports (PX), this will boost exports thanks to a gain in their price-competitiveness. Then, being ε_B^A the elasticity of variable A with respect to variable B, we can write:

$$\left[\frac{\Delta^{X}/_{Y}}{\Delta\Omega}\right]_{Xcomp} = \varepsilon_{\Omega}^{X/_{Y}} * \frac{X}{Y} * \frac{1}{\Omega} = \left(\varepsilon_{\Omega}^{ULC} * \varepsilon_{ULC}^{PX} * \varepsilon_{PX}^{X}\right) * \frac{X}{Y} * \frac{1}{\Omega} \quad (2)$$

2) "Import substitution": If the fall in unit labour costs is transferred to domestic prices (P), this could foster a process of substitution of imports by domestic production, depending on the price elasticity of imports:

$$\left[\frac{\Delta^{M}/_{Y}}{\Delta\Omega}\right]_{Msust} = \varepsilon_{\Omega}^{M/_{Y}} * \frac{M}{Y} * \frac{1}{\Omega} = \left(\varepsilon_{\Omega}^{ULC} * \varepsilon_{ULC}^{P} * \varepsilon_{P}^{M}\right) * \frac{M}{Y} * \frac{1}{\Omega} \quad (3)$$

3) "Demand effect on imports": Besides relative prices, imports depend on the evolution of different components of aggregate demand (C, I, X). Consequently, a second effect of internal devaluation on imports can come through a change in aggregate expenditure. If the fall in ULC provokes a reduction in the wage share and the economy is wage-led –as the empirical literature seems to conclude for the case of Spain- final demand will decrease, and then the demand for imports will be lower:

$$\left[\frac{\Delta^{M}/_{Y}}{\Delta\Omega}\right]_{Mdem} = \left(\varepsilon_{C}^{M} * \varepsilon_{\Omega}^{C/_{Y}} + \varepsilon_{I}^{M} * \varepsilon_{\Omega}^{I/_{Y}} + \varepsilon_{X}^{M} * \varepsilon_{\Omega}^{X/_{Y}}\right) * \frac{M}{Y} * \frac{1}{\Omega} \quad (4)$$

Concluding, the global impact of internal devaluation can be split up in three different channels, whose magnitude depend on all the elasticities that appear in expressions (2), (3) and (4). We estimate them in the next section.

4. Methodology, data and estimation results

Tha Bhaduri-Marglin model includes a set of equations in which changes in the wage share affect different components of the aggregate demand (private consumption, investment and net exports)[4]. This impact takes place directly in some cases (for example, because the propensity to consume out of wages is usually higher than the same propensity out of profits, or because private investment can be sensible to the profit rate) and through changes in domestic or export prices in other (the channel of competitiveness, in the case of net exports). In this section, we use the estimation of these equations to obtain the value of all the elasticities that determine the magnitude of the three channels that we have just defined.

Regarding the estimation techniques, there are two alternative approaches. Authors such as Nishi (2012), Onaran and Stockhammer (2005), Barbosa-Filho and Taylor (2006) and Carvalho and Rezai (2014) aim at estimating a full economic model and therefore employ structural vector autoregression models (SVAR). In this paper, however, we follow the strand of literature that estimates single equations for each aggregate demand component (consumption, investment, imports and exports) and for export and domestic prices. These studies assume the functional income distribution to be exogeneous (in our case, led by internal devaluation policies), but lend themselves to a better reflection of its changes on economic growth (in our case, on net exports).

We use quarterly data from Eurostat, the OECD, the European Commission and the Ministerio de Economía, Industria y Competitividad from 1995q1 until 2017q2. The variables we use are the following: GDP (Y), household consumption (C), adjusted employee compensation (W)[5], adjusted operating surplus (R), private gross fixed capital formation (I), profit share (π), nominal unit labour costs (ULC), nominal long-term interest rates (r), exports (X), imports (M), import prices (pm), export prices (px), prices (p), total GDP of OECD countries (Y*), household debt (Dh), corporate debt (Dc), household debt-to-GDP ratio (DhY), private debt-to-GDP ratio (DpY) and relative export prices vis-à-vis 37 industrialized economies (REER37).[6] All of them are expressed in logarithms.

All variables are in real terms, except for long-term interest rates and unit labour cost. As the ADF tests suggest that most variables are not stationary and we use quarterly data, we take the fourth difference of the variables in order to avoid spurious relations. 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. The presence of autocorrelation has been corrected through the Cochrane-Orcutt transformation.

Specifically, we have estimated the following six equations, and Table 3 illustrates the results we have obtained.

[4] Public consumption and investment are exogenous variables in this model.

[5] 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.

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

$$X = x_o + x_{y*}Y^* + x_{reer37}REER37 \quad (5)$$

$$M = m_o + m_c C + m_I I + m_x X + m_{ppm} PPM \quad (6)$$

$$C = c_o + c_w W + c_r R + c_{dh} Dh + c_{dhy} DhY \quad (7)$$

$$I = i_o + i_y Y + i_\pi \pi + i_r r + i_{dh} Dh + i_{dc} Dc + i_{dpy} DpY \quad (8)$$

$$P = p_o + p_{ucl} UCL + p_{pm} PM \quad (9)$$

$$PX = px_o + px_{ucl} UCL + px_{pm} PM \quad (10)$$

According to equation (5), exports depend on the income level of the rest of the world – measured here by total GDP of the OECD- and the real effective exchange rate vis-à-vis the 37 industrialized economies indicator. X_0 is a constant and the two coefficients to be estimated (x_{y*} and x_{reer37}) have a significant relationship with exports. As expected, an increase in the OECD GDP increases the export volume, while an increase in relative exports prices affects negatively to the export volume.

Regarding imports, equation (6) defines them as a function of consumption (C), investment (I), exports (X) and the ratio of domestic prices over import prices (PPM). Changes in consumption and exports affect positively imports, while an increase in the relative domestic prices to import prices ratio also drives imports up, yet to a lesser extent. Investment does not appear to have an effect on imports, despite different specifications and lag structures.

As the components of final demand affect imports, and they can be affected by distributional changes, we also need to estimate the consumption and investment functions, which include the wage share among their determinants.

Specifically, aggregate consumption is determined by wages (W) and the operating surplus (R), reflecting the effect of changes in functional distribution. Since the propensity to consume out of wages (c_w) is higher than the propensity to consume out of profits (c_r), internal devaluation implies a decrease in consumption, and then in imports.

In order to account for the financialization of the economy, we have also included financial variables both in the consumption function and in investment function, following Onaran et al. (2011), Stockhammer and Wildauer (2016), Onaran and Obst (2016) and Álvarez et al. (2017).

Specifically, we have added the variation in household debt (Dh) and the household debt-to-GDP ratio (DhY) to equation (7). Even though accumulated debt has been proven to have a contractionary impact on consumption (Hein, 2012; Stockhammer and Wildauer, 2016 and Vasudevan, 2016), credit can also be a source of disposable income and hence drive consumption up. This will happen as long as the effect on direct demand induced by credit, exceeds the consumption lost provoked by the debt service payments. So, Dh is expected to have a positive effect on consumption ($c_{dh} > 0$) and DhY a negative effect ($c_{dhy} < 0$) (Palley, 1994).

Regarding investment, the independent variables in equation (8) are national income -as a proxy for expected demand-, profit share -as a proxy for profitability- and long-term interest rates, household debt growth, corporate debt growth and private debt-to-GDP ratio, defined as the sum of household and corporate debt.

We find a strong positive relationship between income and private investment, showing the explanatory capacity of the theory of the accelerator, in line with the results yielded in other studies. Therefore, gross fixed capital formation is mainly driven by aggregate demand, as in other OECD and Eurozone countries (Onaran and Galanis, 2012). The effect of a pro-capital distribution policy has been tested with the lagged profit share (π), but the estimated coefficient is found not to be statistically significant. The same happens when alternative lag structures and specifications are tested. Turning to long term interest rates, these do not have a statistically significant relationship with investment. When it comes to the debt variables, we only find a significant relationship between household debt growth and investment. This could be a reflection of the high residential investment during the period 1995-2007.

The estimated coefficients obtained from the consumption and investment functions confirm that the Spanish economy is wage-led. First, the estimates from the consumption function reveal that the marginal propensity to consume out of wages is greater than that out of profits, the latter being not statistically significant. Second, the profit share has no statistically significant impact on private investment.

Domestic prices (P) are a function of unit labour costs and import prices (PM). The coefficient p_{ulc} represent to what extent changes in unit labour costs are transferred to domestic prices. We find this coefficient statistically significant albeit rather weak: a 1% growth in ULC is only translated in a 0.14% growth in prices.

Finally, we have also estimated a function of export prices -Equation (10)- in which export prices are a function of the sum of unit labour costs and import prices (that is, on their production costs). Nevertheless, as reported in Table 3, unit labour costs are not significantly transferred into export prices. This result reveals, indeed, that a reduction in unit labour costs, and hence in the wage share does not imply a price-competitiveness gain. This outcome is akin to those found in the literature in countries that are similar to Spain. In these countries, the unit labour cost coefficient is significant, yet it is much smaller than that of the domestic prices.

Table 3: Estimation results

VARIABLES	ΔLC	ΔLI	ΔLPX	ΔLX	ΔLM	ΔLP
ΔLY_t		3.256***				
		(0.658)				
ΔLr_t		-0.00600				
		(0.00658)				
$L\pi_{t-1}$		0.396				
		(0.262)				
ΔLDh_t	0.202*	0.865*				
	(0.0919)	(0.408)				
ΔLDc_t		-0.319				
		(0.245)				
$LDpY_t$		0.121				
		(0.100)				
dummyinv09q2		-0.0520*				
		(0.0200)				
ΔLW_t	0.352**					
	(0.115)					
ΔLR_t	0.0719					
	(0.0604)					
$LDhY_t$	-0.0271					
	(0.0237)					
ΔLPM_t			0.437***			0.0260
			(0.0343)			(0.0258)
$\Delta LULC_t$			0.0568			0.137**
			(0.0880)			(0.0417)
ΔLYW_t				2.824***		
				(0.197)		
$\Delta LREER37_{t-1}$				-0.408~		
				(0.214)		
ΔLC_t					1.270***	
					(0.148)	
ΔLX_t					1.001***	
					(0.102)	
$\Delta LPPM_t$					0.267**	
					(0.0838)	
ΔLI_t					0.0689	
					(0.0550)	
dummym09q1					-0.0375***	
					(0.00958)	
Constant	0.151	-2.335~	0.00630*	-0.0116~	-0.0272***	0.0108*
	(0.128)	(1.271)	(0.00297)	(0.00617)	(0.00681)	(0.00511)
Observations	69	68	85	84	68	85
R-squared	0.367	0.559	0.671	0.583	0.907	0.064
F (p-value)	0.0154	0.00217	0.0122	0.00951	3.21e-05	0.147
DW	1.352	2.053	1.959	1.841	2.042	0.975
ll	238.2	154	295.1	203.7	201.1	317.1
BIC	-455.2	-274.2	-576.9	-394.2	-376.9	-620.8
rho	0.901	0.859	0.675	0.607	0.777	0.873

*** p<0.001, ** p<0.01, * p<0.05, ~ p<0.10

The final part of our exercise is to apply these results to quantify the three channels through which internal devaluation affect the external balance that we have defined in the previous section.

- Price-competitiveness effect on exports:

According to (2), the relation between a change in the wage share and a variation in exports depends on the relation between Ω and ULC ($\varepsilon_{\Omega}^{ULC}$); 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}).

To obtain the first of these elasticities we can take into account that the wage share is equivalent to real unit labour cost. In logarithms:

$$\Omega = ULC - P \qquad (11)$$

On the other hand, equation (9) express domestic prices (P) as a function of unit labour costs. Substituting (9) in (11), rearranging and deriving, we have:

$$\Omega = (1 - pulc)ULC - p_o - p_{pm}PM$$

$$\frac{\partial ULC}{\partial \Omega} = \varepsilon_{\Omega}^{ULC} = \frac{1}{1 - pulc}$$

We have obtained an estimated value of p_{ucl} equal to 0.137, so that $\varepsilon_{\Omega}^{ULC}$ is equal to 1.159: a negative growth rate of 1% in the wage share requires a -1.159% growth rate in ULC.

Nevertheless, we have not found statistically significant the relation between ULC and export prices. That means that reductions in ULC are nor systematically translated into lower export prices (px_{ucl} = ε_{ULC}^{PX} = 0).

Finally, as REER37 is defined as $\prod_i^n Px/(Px_i * e_i)\text{^}w_i$, where e_i is the nominal exchange rate, w_i the weight of each trade partner and PX are export prices in Spain and the rest of competitors, we can take x_{reer37} as the export price elasticity of exports. Therefore, the export price elasticity of exports (ε_{PX}^{X}) is -0.408. If the growth rate of export prices is -1%, exports grow at a 0.408% growth rate.

- Import substitution due to lower domestic prices:

In this case, we need the values of $\varepsilon_{\Omega}^{ULC}$ (whose value is 1.159, as we have just seen); ε_{ULC}^{P} (the extent to which a change in ULC is translated into domestic prices) and ε_{P}^{M} (the price elasticity of imports).

The unit labour costs elasticity of domestic prices is equivalent to the coefficient p_ulc of the equation (9) of domestic prices. Unlike for the export prices function, this translation of ULC changes to domestic prices is statistically significant -albeit rather weak- and ε_{ULC}^{P} amounts 0.137.

Finally, we can also obtain ε_{P}^{M} directly from equation (6) of imports, because it is equivalent to coefficient m_{ppm}. It is equal to 0.267.

- Demand effect on imports:

The third channel through which internal devaluation can affect net exports captures the effect of a modification in functional distribution on aggregate expenditure and, then, on imports demand.

Its magnitude depends on the product of the elasticities $\varepsilon_C^M * \varepsilon_\Omega^{C/Y}$, $\varepsilon_I^M * \varepsilon_\Omega^{I/Y}$ and $\varepsilon_X^M * \varepsilon_\Omega^{X/Y}$. Nevertheless, we have seen that $\varepsilon_\Omega^{X/Y}$ is not statistically significant –there is not a systematic translation of changes in ULC to export prices- and the estimation of equation (6) also shows that m_I (and, then, ε_I^M) is statistically equal to zero.

Therefore, this demand effect on imports only takes place through variations in aggregate consumption derived from changes in the wage share. Specifically, we can calculate first the effect of a change in the wage share on consumption using equation (7):

$$C = c_o + c_w W + c_r R + c_{dh} Dh + c_{dhy} DhY \quad (7)$$

We substitute W by $Y\Omega$, and R by $Y(1-\Omega)$:

$$C = c_o + c_w Y\Omega + c_r Y(1-\Omega) + c_{dh} Dh + c_{dhy} DhY$$

Finally, dividing by Y and deriving, we have the elasticity of consumption relative to the wage share, whose value can be obtained from Table 3:

$$\frac{C}{Y} = \frac{c_o}{Y} + (c_w - c_r)\Omega + \frac{c_{dh} Dh}{Y} + \frac{c_{dhy} DhY}{Y}$$

$$\varepsilon_\Omega^{C/Y} = \frac{\frac{\partial C}{Y}}{\partial \Omega} = (c_w - c_r) = 0.352$$

The total effect on imports also depends on the elasticity of imports to consumption (ε_C^M), which according to equation (6) is equal to 1.27.

5. The effects of the internal devaluation strategy on the external sector

From the estimated coefficients retrieved in the previous section, we are able to calculate the marginal effects of a 1p.p. decrease in the wage share on the external sector, using expressions (2), (3) and (4) and the average values of X/Y, M/Y and Ω during the internal devaluation period (2010q1-2017q2).

Table 4 summarizes the effect of a 1p.p. decrease in the wage share on net exports, by dividing the effects occurred into the three mechanisms analysed: 1) the effect of price-competitiveness on exports, 2) the import substitution effect and 3) the demand effect.

Our main results are the following:

1. The price-competitiveness on exports is not statistically significant, because we have not found evidence of a systematic relationship between unit labour costs and export prices.
2. On the imports-side the picture is quite different, because the reduction in ULC due to internal devaluation policies is partially translated into domestic prices, provoking some import substitution, although its magnitude is very limited. Specifically, our estimations show that if the wage share is reduced in 1p.p., the ratio of imports on GDP is reduced by 0.02p.p.

3. Finally, the introduction of consumption, exports and investment as explanatory variables in the imports function enables us to measure the improvement in net exports due to the fall in domestic demand that follows a 1p.p. reduction in the wage share. According to Table 4, the ratio of imports to GDP would be reduced by 0.20 p.p.

Table 4: Effect chain of a 1p.p. decrease in the wage share (Ω) on net exports at mean values 2010-2017

	Price-competitiveness effect							Demand effect					Total
var	$\varepsilon^{ulc}_{\Omega}$	ε^{px}_{ulc}	ε^{X}_{px}	ε^{X}_{Ω}	1/Ω	X/Y		$\varepsilon^{C/Y}_{\Omega}$	ε^{M}_{C}	1/Ω	M/Y		(ΔNX/Y)/ΔΩ
Exports	1.159	n.s	-0.408	n.s	1.626	0.300	n.s						n.s
	Import substitution effect												
	$\varepsilon^{ulc}_{\Omega}$	ε^{P}_{ulc}	ε^{M}_{p}	ε^{M}_{Ω}	1/Ω	M/Y							
Imports	1.159	0.137	0.267	0.042	1.626	0.272	0.019	0.352	1.270	1.626	0.272	0.198	0.217
Net exports							**-0.019**					**-0.198**	**-0.217**

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

Notes:
-$\mathcal{E}_{\Omega}^{ULC}$ is the wage share elasticity of unit labour costs and is calculated as 1/1-$\mathcal{E}_{\mathrm{ULC}}^{P}$ (see Equation 11).
-$\mathcal{E}_{\mathrm{ULC}}^{PX}$ is the unit labour costs elasticity of export prices (Table 3, export prices equation).
-$\mathcal{E}_{\mathrm{ULC}}^{P}$ is the unit labour costs elasticity of domestic prices (Table 3, domestic prices equation).
-$\mathcal{E}_{\mathrm{p}}^{M}$ /$\mathcal{E}_{\mathrm{PX}}^{X}$ are the domestic/export prices elasticities of imports/exports (Table 3, imports/exports equations).
-$\mathcal{E}_{\Omega}^{M}$ and $\mathcal{E}_{\Omega}^{X}$ are the wage share elasticity of imports and exports respectively and is the product of the three first columns.

Therefore, taking together these three effects, a 1p.p. decrease in the wage share has only an impact of 0.217p.p. on the net exports to GDP ratio. Most of this decrease (91%) induced by the change in the wage share occurred via the demand effect, and not through the improvement in competitiveness, confirming that the demand effect dominates the prices effects. This result is in line with the results found in other countries.[7] During the internal devaluation period, the wage share has decreased by 2.89p.p. leading to an improvement of net exports by 0.61p.p.

6. Conclusions

The internal devaluation strategy has had a significant effect in the Spanish current account readjustment. This effect has, however, followed a different transmission mechanism as the one expected by the proponents of the strategy. Instead of achieving a gain in price-competitiveness, which would in turn boost exports, the fall in unit labour costs has affected imports via two distinguished ways and had no effect on exports. On the one hand, the fall in unit labour costs has decreased domestic prices, thus rendering domestic products more price-competitive than imports, which results in a certain degree of imports substitution. This effect is given by the low transmission factor (p_{ucl}), which is smaller than one and very close to zero, implying that changes in unit labour costs translate themselves to a high extent into changes in the wage share. This effect is rather small in the studied period; reflecting that the demand for imports are quite inelastic to prices. On the other hand, since imports are defined as a function of the aggregate demand components as well, the demand effect is that effect caused by the fall on imports volume driven by the fall on consumption. Indeed, this effect is a reflection of the demand regime of the Spanish economy, since a fall of the wage share depresses internal demand. The estimations carried out show that, in total, the internal devaluation strategy readjusted the Spanish external sector by 0.61p.p.

[7] For example, Schröder (2011) illustrates this for the United States and Germany.

This finding has direct policy implications. As proven in this paper, pro-capital distribution policies would further contain aggregate demand and lead the Spanish economy to a lower growth path. In order to boost exports, a more adequate policy would include the improvement of non-price factors such as the quality of the products and the exports structure.

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