

A supermultiplier demand-led growth accounting analysis applied to the Spanish economy (1998-2019)¹

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Abstract

In this paper, we analyze the pattern of economic performance of Spain from 1998 to 2019 and its determinants. We apply the supermultiplier demand-led growth accounting methodology in Freitas and Dweck (2013) but with two modifications. First, we incorporate consumption out of public transfers, following the theoretical discussion in Haluska et al (2021) and its incorporation in demand-led accounting in Haluska (2021). Second, we incorporate consumption out of public wages as a source of autonomous demand, following the theoretical discussion in Serrano and Pimentel (2019). The introduction of the latter in demand-led growth accounting analysis is a specific contribution of this paper. Our demand-led growth decomposition highlights both the relevance of public demand and exports as important stable growth drivers in Spain, and the role of the changing supermultiplier to reduce its growth rates. Our decomposition also identified three different periods of growth - the economic expansion of 1998-2008, the great recession of 2008- 2013 and the economic recovery of 2014-2019. Our results suggest that the real estate boom was important to the economic expansion of 1998 – 2008 not only because its direct effect, but also because the indirect effect of increasing public revenues and opening space to the expansion of public demand. The results also show that exports itself was not enough to lead the recovery, as it contributed positively during the recession and the recovery started only with the resumption of the public demand and private demand.

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1. Introduction

The idea that economic growth is driven by effective demand is central to post-Keynesian economics. The authors from this perspective have a tradition in applying demand-led growth perspective to analyze concrete experiences of economic growth of several countries, to study demand and growth regimes (Hein, 2011, Hein and Martschin, 2021) or the drivers of growth (Kohler and Stockhammer, 2021). More recently, Comparative Political Economy also started to discuss the demand-led growth perspective applied to the concrete experiences of economic growth of several countries (Baccaro and Pontusson, 2016) opening the possibility of debates with the post-Keynesian tradition.

The Sraffian supermultiplier model (Serrano, 1995, Cesaratto et al., 2003) and its Kaleckian version with autonomous demand have been used by a broader group of post-Keynesian researchers at a theoretical level (Allain, 2015, Lavoie, 2016, Dutt, 2019, Palley, 2019, Fazzari et al, 2020, Hein & Woodgate, 2021). Also, there is a tradition in applying this supermultiplier framework to a demand-led growth accounting (Freitas and Dweck, 2013, Bastos and Porto, 2016, Haluska, 2021, Morlin et al., 2022, Passos and Morlin, 2022, Barbieri-Goes, 2022). Stockhammer and Kohler (2022) recognize that the supermultiplier theory could also be applied and provide a similar perspective than post-Keynesian to the analysis of demand-led growth for the concrete episodes of growth performance by countries. Campana et al (2022) consider that the supermultiplier demand-led accounting can be complementary to the post-Keynesian ‘demand and growth regimes’ and ‘growth drivers’ methods discussed above.

In this paper, we apply the supermultiplier demand-led growth accounting methodology to analyze the economic performance of Spain from 1998 to 2019. We follow the methodology in Freitas and Dweck (2013) but with two modifications. First, we incorporate consumption out of public transfers, following the theoretical discussion in Haluska et al (2021) and the incorporation in demand-led accounting in Haluska (2021). Second, we incorporate consumption out of public wages as a source of autonomous demand, following the theoretical discussion in Serrano and Pimentel (2019). The introduction of the latter in demand-led growth accounting analysis is a specific contribution of this paper. These modifications are based on the theoretical distinction by the supermultiplier theory that consumption out of public transfers and wages are not systematic related with the production process. And they contribute to disentangle what is commonly considered as induced private consumption out of disposable income between the sources of financing from private and public sector.

We identified three different periods of growth - the economic expansion of 1998-2008, the great recession of 2008- 2013 and the economic recovery of 2014-2019. We evaluate the role of both the induced and autonomous components of demand and its importance to the growth patterns in each of these three periods. We argue that our demand-led growth decomposition highlights both the relevance of public demand and exports as growth drivers, and the role of the changing supermultiplier to reduce the rates of growth of Spain. We compare our results with interpretations of Spanish growth patterns found in the literature. Our results suggest that the real estate boom

was important to the economic expansion of 1998 – 2008 not only because its direct effect, as commonly seen in the literature, but also because the indirect effect of increasing public revenues and opening space to the expansion of public demand. The results also show that exports itself was not enough to lead the recovery, as is also mentioned in the literature, as it contributed positively during the recession and the recovery started only with the resumption of the public demand and private demand.

Besides this introduction, the paper is articulated into four more sections. In section 2 we briefly present the supermultiplier theory and the supermultiplier demand-led growth accounting methodology. In section 3 we present our results. In sections 4 we compare our results with both the mainstream and post-Keynesian interpretation of Spanish growth patterns found in the literature. We make our final remarks in section 5.

2. Supermultiplier theory and demand-led growth accounting

The supermultiplier theory (Serrano, 1995) endorses the Keynesian-Kaleckian principle of effective demand and extends it to the long run, by a conceptual separation of aggregated demand between autonomous and induced components. The latter include those components of demand that are systematically related to the production process, such as the capacity generating investment by business firms and (part of) consumption financed out of contractual wages. These induced expenditures are considered systematically related to the production process since production generates contractual wages, which are (at least partially) spent by workers, and business investment is made to adapt the productive capacity to the expected level of demand, which depends on the actual levels of output and effective demand. On the other hand, the autonomous expenditures are not systematically related with the production process and in general are determined by a wide range of diverse factors reflecting social, political and institutional settings of specific economies and influenced by the economic policy stance. Among these components typically categorized as autonomous in the supermultiplier theory are households' demand financed out of debt (residential investment and credit-financed consumption), discretionary consumption by the wealthy, government demand (determined by the economic policy stance) and exports (importantly driven by the income growth of the rest of the world). Moreover, we must include in the supermultiplier both the tax burden and the propensity to import.

Changes in the coefficients defining the value of the supermultiplier, such as the functional income distribution, propensity to invest, propensity to import and tax burden have a permanent effect on the level of output, as well as the average growth rate during the time that takes of these parameters to adjust (Freitas & Serrano, 2015; Lavoie, 2016). On the other hand, the growth rate of autonomous components is related to the trend rate of economic growth. Finally, the supermultiplier theory considers functional income distribution as influenced by 'the bargaining power of the

opposite classes, by customs and social norms concerning the fairness of remunerations and other social habits' (Pariboni, 2016, p.218).

Recently, there have been some attempts to apply the supermultiplier theory to analyze concrete experiences of growth both from advanced and developing economies. This consists in adopting a demand-led growth accounting methodology, as an alternative to the well-known supply-side growth accounting inspired by the neoclassical theory of growth and distribution (Solow, 1957, Hulten, 2010). This demand-led growth accounting based on the supermultiplier theory allows inspecting growth patterns by developing a 'theoretically informed decomposition' of economic growth based on the autonomous and induced demand dichotomy (Morlin et al., 2022). This methodology has been used by Freitas & Dweck (2013) and Haluska (2021) to analyze the Brazilian economy, Bastos & da Silva Porto (2016) for Portugal, Passos and Morlin (2022) for Latin American countries, Morlin et al. (2022) for a set of OECD countries and Barbieri-Goes (2022) for the US.

We apply the same methodology to the Spanish Economy. We will start by rearranging the national accounts' aggregate demand components in accordance with the supermultiplier theory to decompose the economic growth rates and evaluate the aggregate effect of changes in each of the aggregate demand variables included in the specification. Our aggregate demand taxonomy will follow the supermultiplier literature (Freitas & Dweck, 2013, Girardi and Pariboni, 2016, 2020). We add to the sources of autonomous demand both the consumption out of transfers, following Haluska et al (2021) and Haluska (2021), and the consumption out of public wages. The latter is a specific contribution of the paper to the supermultiplier demand-led growth accounting literature. We should stress that this separation between induced and autonomous - for some specific components of demand - is somehow arbitrary, and the results of the decomposition reflect the choices regarding this taxonomy.

We group autonomous components into i) private demand: composed by credit-financed consumption, private residential investment and private investment in research and development⁴; ii) public entities demand: composed by government consumption, government investment and public companies' investment⁵; iii) consumption out of public income: composed by consumption out of transfers and consumption out of public wages; and iv) external demand: exports⁶.

The variables are defined as follows (see table 1 for a glossary, table 2 for the equations and annex for details about data sources). Aggregate supply, composed by

⁴ Deleidi and Mazzucato (2019) call attention that part of the business spending in R&D can be considered induced as it is important to innovation and productive capacity creation. To separate empirically the autonomous and induced parts of expenditures in R& D can be difficult in practice, and we thus consider this variable as part of the autonomous demand.

⁵ We consider public companies' investment as autonomous following Freitas and Dweck (2013, p. 185) because "capitalist competition did not exert a major influence on its behavior". For a different interpretation see Campana et al (2022) who consider public companies' investment as an induced component of demand.

⁶ The grouping is like that of (Haluska, 2021), but splitting public expenditures into public entities expenditures and consumption out of public income to make the effects of changes in the propensity to consume more visible.

GDP plus imports, is equal to aggregate demand, which is composed by consumption, investment, and exports. Consumption is made by households and government⁷. We split households' consumption into an autonomous and an induced component. Autonomous consumption encompasses credit-financed consumption and consumption out of public income. Credit-financed consumption is equal to the volume of new consumption credit, once we consider the (average effective) tax on value added (equation 2)⁸. Consumption out of public income corresponds to the part of consumption financed by public transfers and the public wage bill. This is obtained by multiplying the latter by propensity to consume net of (average effective) taxes to households' public income. For consumption out of transfers, only the tax on value added applies, whereas for consumption out of public wages we also consider the tax on wages (equation 3). Induced consumption or consumption out of private wages (equation 4) is obtained by private wage bill deduced from taxes multiplied by the aggregate propensity to consume⁹. The private wage bill is defined as the product of the private (adjusted) wage share and the aggregate income¹⁰. We introduce two different taxes to consistently account for changes in taxation while decomposing consumption in the above-mentioned items.

Investment is decomposed into a public (autonomous) component, made up of government investment and investment by public companies, and a private investment. The latter is split into autonomous private investments, made up of private residential investment and private investment in research and development, and induced investment, which we estimate residually (equation 7). Private residential investment is estimated by subtracting government's residential investment and adding investment in non-residential constructions by the real estate sector from total residential investment. The latter has been introduced as it constitutes an extension of residential investment and does not contribute to increase productive capacity. In line with the supermultiplier theory, productive investment keeps a certain relation with GDP captured by the propensity to invest (equation 7) and is considered an induced component of demand.

Aggregate demand may be hence rearranged as the sum of autonomous demand and induced demand (equation 8). Autonomous demand encompasses autonomous consumption and autonomous investment, public expenditures and exports (equation 9). Public expenditures comprise government consumption, government investment and investment by public companies (equation 10). Imports are defined as the share of domestic content in demand (equation 11). Hence,

⁷ We include under consumption by households the consumption of non-profit institutions serving households.

⁸ Contrary to other applied works, we do not proxy credit-financed consumption with consumption of durable goods, since for the case of Spain there is data available on the volume of new consumption credit from 2003. For the remaining years we have extrapolated the series using consumption of durable goods as reference (see annex for more details).

⁹ See annex II for details about the calculation of the propensity to consume.

¹⁰ To obtain the private adjusted wage share we first, indeed, estimate W_{priv} by multiplying the adjusted wage share by Y and, in turn, we calculate the ratio W_{priv}/Y . We have opted for the adjusted, instead of the normal, wage share to also encompass the wage-like income earned by self-employed workers, which represent a significant part of the total.

replacing each term in equation 8 by their ultimate expressions as specified in the remaining equations and operating we obtain the ultimate definition of output as the supermultiplier and autonomous demand (equation 12). The value of the supermultiplier depends positively on the propensity to consume out of wages, the private wage share, and the propensity to invest, while negatively on the propensity to import and the effective average tax rates on value added and wages.

Table 1: Glossary of variables

| Demand components | Main aggregates |
|---|--|
| C Consumption | Y Income |
| C_G Government consumption | D Aggregate demand |
| C_A Autonomous consumption | Z Autonomous expenditures |
| C_{pub} Consumption out of public income | |
| C_{cred} Credit-financed consumption | |
| C_I Induced consumption (out of private wages) | |
| I Investment | |
| I_G Government investment | |
| I_{PC} Public companies' investment | |
| I_A Private autonomous investment | |
| I_{Res} Private residential investment | |
| $I_{D\&R}$ Private investment in development and research | |
| I_I Induced investment (productive investment) | |
| G Public expenditures | |
| M Imports | |
| X Exports | |
| | Other aggregate variables |
| | W Wage bill |
| | W_{priv} Private wage bill |
| | W_{pub} Public wage bill |
| | Tr Transfers |
| | T_w Taxes on wages |
| | Cr Consumption credit |
| | Coefficients |
| | α Supermultiplier |
| | ω (Adjusted) private wage share |
| | c Propensity to consume (out of wages and transfers) |
| | h Propensity to invest |
| | t_w (Effective average) tax rate on wages |
| | t_{VA} (Effective average) tax rate on value added |
| | m Propensity to import |

With the above specifications, we may express the rate of growth of GDP in terms of the rate of growth of autonomous demand and the parameters, multiplied by their corresponding coefficients and shares and the supermultiplier, as shown in equation 13¹¹.

¹¹ Subscript 0 denotes previous year, while subscript 1 denotes end of current year, \dot{x} represents the rate of growth of the variable x . The β parameters are related with the tax burden and the propensity to consume (see annex 3).

Table 2: Equations

$$Y = C + I + (X - M)$$

$$C = C_H + C_G$$

$$C_H = C_A + C_I$$

$$C_A = C_{cred} + C_P \quad (1)$$

$$C_{cred} = (1-t_{VA}) Cr \quad (2)$$

$$C_P = c(1-t_{VA}) Tr + c(1-t_{VA})(1-t_w) W_{pub} \quad (3)$$

$$C_I = c(1-t_{VA})(1-t_w) \omega Y \quad (4)$$

$$I = I_G + I_{PC} + I_A + I_I \quad (5)$$

$$I_A = I_{Res} + I_{R\&D} \quad (6)$$

$$I_I = I - (I_G + I_{PC}) - I_A = hY \quad (7)$$

$$D = Y + M = Z + C_I + I_I \quad (8)$$

$$Z = C_A + I_A + G + X \quad (9)$$

$$G = C_G + I_G + I_{PC} \quad (10)$$

$$M = mD \quad (11)$$

$$Y = \left(\frac{1-m}{1-(1-m)[c(1-t_{VA})(1-t_w)\omega+h]} \right) Z = \alpha Z \quad (12)$$

$$\dot{Y} = \alpha_1 \left[\beta_{Cr} \frac{Cr_0}{Y_0} \dot{Cr} + \beta_{Tr} \frac{Tr_0}{Y_0} \dot{Tr} + \beta_{W_{pub}} \frac{W_{pub0}}{Y_0} \dot{W}_{pub} + \frac{I_{Res0}}{Y_0} \dot{I}_{Res} + \frac{I_{R\&D0}}{Y_0} \dot{I}_{R\&D} + \frac{G_0}{Y_0} \dot{G} + \frac{X}{Y_0} \dot{X} \right. \\ \left. + \beta_c c_0 \dot{c} + \beta_\omega \omega_0 \dot{\omega} - \beta_{t_w} t_{w0} \dot{t}_w - \beta_{t_{VA}} t_{VA0} \dot{t}_{VA} + h_0 \dot{h} - \beta_m m_0 \dot{m} \right] \quad (13)$$

3. Results

3.1 General results

Our demand-led growth accounting points to some structural features and long-term trends in the Spanish economy, as we can see table 3. First, considering the whole

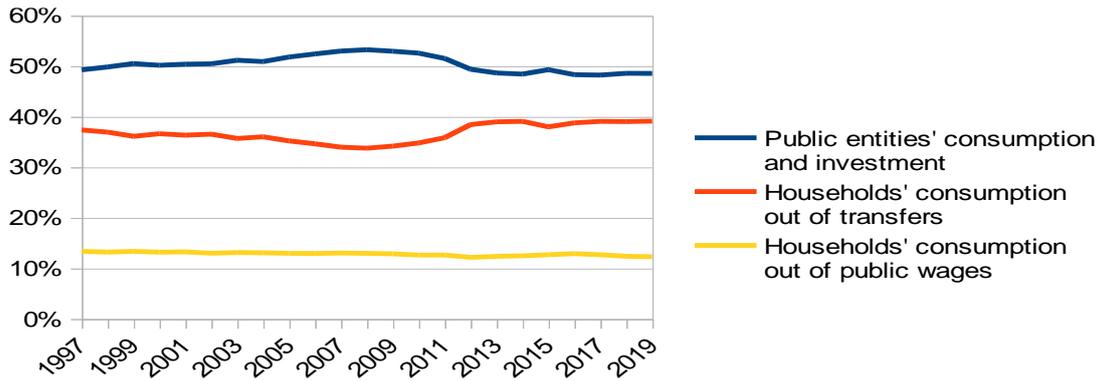
period 1998-2019, the exports and public sector demand are the most important drivers of growth of autonomous demand, while the contribution of the private autonomous consumption and residential investment is much smaller. Also, if we calculate the net contributions of public, external and private sector, we have for the whole period both the public and external sectors leading the growth while the private sector has a minor, although positive, contribution to growth.

Table 3 – Growth decomposition

| | 1998-2007 | 2008-2013 | 2008-2009 | 2010-2013 | 2014-2019 | 1998-2019 |
|-----------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| GDP | 3.69% | -1.09% | -0.87% | -1.20% | 2.59% | 2.09% |
| Public expenditures | 2.00% | 0.36% | 3.45% | -1.18% | 0.87% | 1.25% |
| Public entities' demand | 1.28% | -0.34% | 1.53% | -1.27% | 0.30% | 0.57% |
| Transfers | 0.50% | 0.65% | 1.44% | 0.26% | 0.45% | 0.53% |
| Public wages | 0.23% | 0.04% | 0.47% | -0.17% | 0.12% | 0.15% |
| Private expenditures | 1.08% | -1.26% | -2.34% | -0.71% | 0.73% | 0.35% |
| Consumption credit | 0.36% | -0.49% | -1.05% | -0.20% | 0.41% | 0.14% |
| Private residential Investment | 0.69% | -0.77% | -1.39% | -0.47% | 0.28% | 0.18% |
| Other autonomous investment | 0.03% | 0.00% | 0.09% | -0.04% | 0.04% | 0.02% |
| External expenditures | 1.73% | 0.56% | -1.88% | 1.78% | 1.55% | 1.36% |
| Supermultiplier parameters | -1.12% | -0.75% | -0.09% | -1.08% | -0.55% | -0.87% |
| Private wage share | -0.30% | -0.31% | -0.40% | -0.26% | 0.04% | -0.21% |
| Propensity to consume | 0.40% | -0.19% | -1.86% | 0.64% | -0.68% | -0.06% |
| Propensity to invest | 0.34% | -0.73% | -2.46% | 0.14% | 0.54% | 0.10% |
| Propensity to import | -1.52% | 1.16% | 4.20% | -0.36% | -0.60% | -0.54% |
| Wage taxation | 0.01% | -0.15% | 0.10% | -0.28% | 0.12% | 0.00% |
| Value added taxation | -0.05% | -0.52% | 0.32% | -0.95% | 0.03% | -0.16% |
| Net contributions | | | | | | |
| Public sector | 1.97% | -0.32% | 3.87% | -2.41% | 1.02% | 1.09% |
| Private sector | 1.51% | -2.49% | -7.06% | -0.20% | 0.63% | 0.19% |
| External sector | 0.21% | 1.72% | 2.32% | 1.41% | 0.94% | 0.82% |

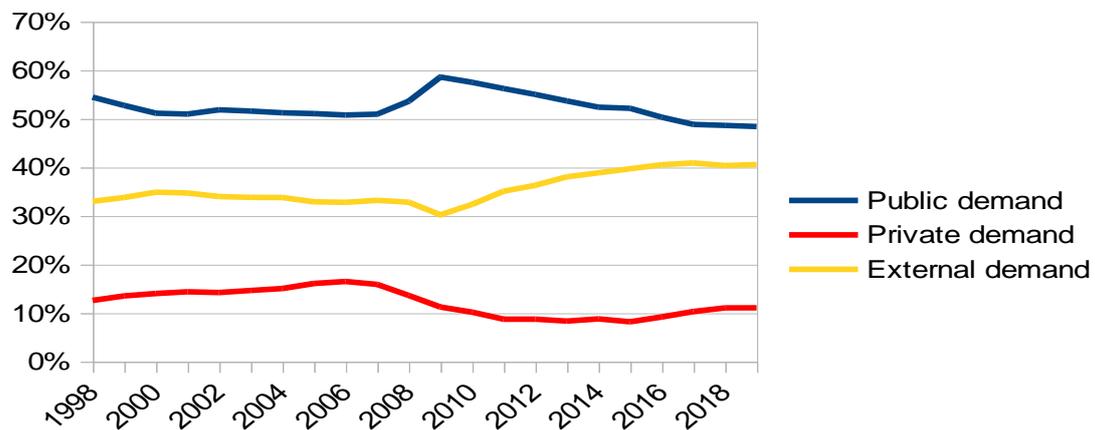
This result is conditioned by our assumptions in the demand decomposition, which contrary to Freitas and Dweck (2013), Passos and Morlin (2022) and Morlin et al. (2022), include the consumption out of public wages and transfers as public expenditures. In table 3 we also disaggregated these components to make it explicit and we show the share of these components in public demand in figure 1.

Figure 1: Participation on public demand



In figure 2 we can see that the share of the public and exports in autonomous demand are much higher than the private share. Also, that the private sector decreased its relative participation in autonomous demand after the GFC.

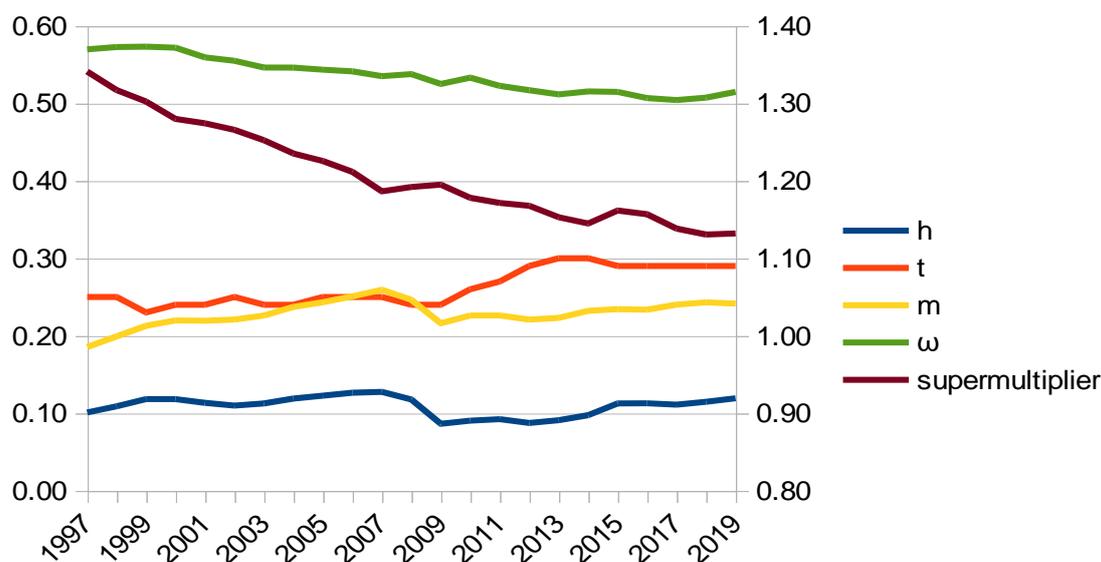
Figure 2: Participation in autonomous demand



A second interesting feature found by our demand-led growth accounting methodology regards the stabilizing effect of “exports” and “consumption out of public transfers and public wage” on growth. They seem to provide a floor to the growth rate of autonomous demand in the Spanish economy in almost the whole period under analysis (exceptions of exports in the GFC and consumption out of public wages during austerity).

A third noteworthy point regards the behavior of the estimated supermultiplier, which has followed a downward trend and contributed negatively to growth in the whole period. This pattern resulted mainly from two long-term trends: i) a continuous shrinkage of the private wage share and ii) the upward trend of the propensity to import. Figure 3 details the trend of the supermultiplier and each of its components in the whole period.

Figure 3: Model parameters (left axis) and the supermultiplier (right axis)¹²



The private wage share decreased from 57% in 1998 to 50% in 2018¹³. The fall of private wage share can be explained by structural changes affecting workers' bargaining power (Stirati & Meloni, 2021), as a result of the following factors: first, a regime of capital-labor relations focused on wage moderation supported by the two main Spanish trade unions (Muñoz de Bustillo Llorente & Antón Pérez, 2007); Second, fall in the coverage ratio of collective agreements¹⁴ and in the ratio of union membership, as well as an increase in the ratio of involuntary part-time employment; Third, job creation biased towards sectors with less struggle tradition and lower ratios of union membership (Blanco, 2004); Fourth, the precarious conditions in which migrants from non-EU countries are incorporated to the labor market, despite displaying similar levels of education with the nationals (Muñoz de Bustillo, 2007); Fifth, the program of structural reforms and fiscal consolidation implemented from 2010 such as the changes in labor regulation implemented between 2010-2012 (Álvarez et al., 2018), cuts and freezing in public wages between 2010-2014 (Uxo et al., 2016) and the reduction in the quantity and scope of unemployment benefits in 2012. Finally, the persistence and duration of unemployment, captured by the fall of the rate of unemployment coverage (Cárdenas del Rey & Herrero Alba, 2021), may have also been important in explaining the fall in the wage share.

¹² The variable t is estimated by combining wage and value-added taxation in the following way: $(1-t) = (1-t_w)(1-t_{VA}) \rightarrow t = t_{VA} + t_w - t_w t_{VA}$.

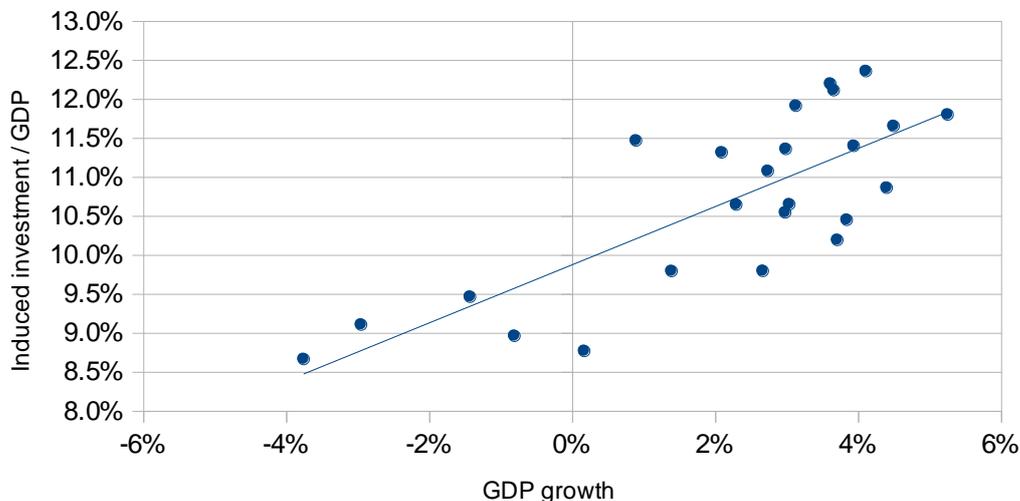
¹³ There was a slight recovery in 2019 which may be attributed to the significant increase in the minimum wage implemented in this year.

¹⁴ The ratio of coverage of sectoral collective agreements was relatively high in Spain compared to other countries, while the regulatory minimum wage too low, making the wages set by the former more determinant than the later for the bargaining power balance (Fernández et al., 2006).

The upward trend of the propensity to import may be explained by changes in the composition of the aggregate demand, as well as an increase in the import intensity of certain components of the demand. Exports, the component with the highest import content (Gandoy, 2017), increased their relative weight on the aggregate demand. Also, exports increased their import content throughout the whole period, a fact typically attributed to the deepening in the integration of global value chains (Myro, 2018). The import content also increased for private consumption and productive investment (Bussière et al., 2013, Bank of Spain, 2017a, p. 93, 2020a, pp. 28–29). Another key factor which might help explaining the structural increase in the propensity to import is the membership to the EMU. Finally, the propensity to import is also explained by the behavior of the propensity to invest, since productive investment is the demand component with the second highest import content (see figure 3).

The investment share seems to be consistent with the flexible accelerator mechanism advocated by the supermultiplier theory. From this theoretical perspective, induced investment moves with the GDP (although with greater volatility) and the investment share should be positively correlated with the rate of growth of GDP. The expected pattern can be observed in figure 4¹⁵. This evidence seems to be in favor with our ‘theoretical informed decomposition’ which considered private capacity creating business investment as an induced variable.

Figure 4: Induced investment share over GDP v. GDP growth rate



3.2 Three phases of growth

The Spanish economy went through three different periods between 1998-2019. The first one, 1998-2007, was a phase of economic expansion, the largest experienced since democracy was re-established in 1975. The average growth rate (3.65%) was

¹⁵ For evidence in favor of the accelerator effect for OECD countries, including Spain, see Girardi and Pariboni (2020) and Perez-Montiel and Erbina (2020).

above all the euro area members except Ireland (Euro Area-12 grew 2.15%). The second period, 2008-2013, was marked by a recession, as a result of two shocks - the Global Financial Crisis and the euro area sovereign debt crisis. Real GDP shrank by almost 10% during this five-year recession. The third period, 2014-2019, marked the recovery of the Spanish economy, initiated in the first quarter of 2014. Growth, however, was weaker than in the first period, with an average rate of 2.6%.

Our demand-led growth accounting decomposition results are displayed in Table 3. They show that in the first economic expansion (1998-2007) the autonomous demand growth was driven mainly by public spending and external demand, and then private demand (mainly residential investment), while the supermultiplier contributed strongly to reduce growth. Public spending expansion was mainly due to the discretionary increase in public entities' demand, although the contribution of transfers and public wages was not negligible, but much more in line with the average. Exports also contributed strongly to autonomous demand growth, followed by private autonomous demand. However, private residential investment contributed to this period much more than the average¹⁶.

If we consider the net contribution of each institutional sector, however, these results change. From this perspective the public sector is still the most important source of demand, followed closely by the private sector, and then for the external sector (as for the latter the important contribution of exports must be discounted by the increase in the propensity to import, both for structural reasons and for the increase in the propensity to invest). However, it is important to stress, the three institutional sectors contributed positively to growth in the period.

The recession (2008-2013) was led by a strong negative contribution of private autonomous demand followed by a positive but moderated contribution of public autonomous demand, and it was not worse because exports contributed positively. The supermultiplier also contributed negatively to growth, as the positive contribution to growth of the change in the propensity to import was more than compensated by the negative contribution because of the fall in propensity to invest, the wage share and the increase in tax burden. The results in terms of institutional sectors' net contribution to demand-led growth point to a strong negative impact of the private sector and a moderate negative contribution of the public sector. The former was due to the combined effect of the crisis in the housing market and the financial sector (and its multiplier-accelerator feedbacks) while the latter was caused by subsequent austere fiscal policy. Even with a strong contribution of the external sector (because of positive contribution of growing exports and falling imports), the result was contractionary to output.

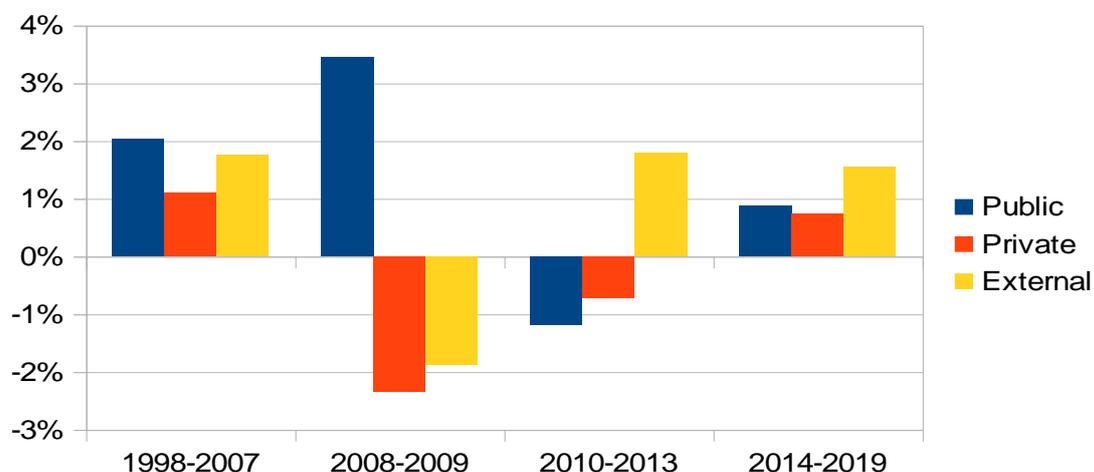
The recession can be divided into two phases. The first phase of the recession (2008-2009) was led by the collapse in private demand and external demand, with the slump in global trade coinciding with the onset of the GFC. Fiscal policy acted counter-

¹⁶ It should be noticed that the role of credit for consumption can be underestimated. Our data does not account for the part of mortgage credit that was used for consumption, a common practice among banks (Bover et al., 2019). In turn, this means that the increase in the propensity to consume can be overestimated in our results. Since we have split the part of households' consumption non-funded by public revenues into that funded by private revenues and that financed by credit, other things equal, an increase in the latter implies a reduction in the propensity to consume.

cyclically, with automatic stabilizers and public consumption and investment expansion with the ‘Plan E’. The second phase of the recession (2010-2013) was mainly driven by a contraction in public spending coupled with an increase in wage and value-added taxation, following the implementation of austerity policies, while the external demand recovered. These policies comprehended cuts in public consumption and investment and reductions in public wages, unemployment benefits and other public transfers. The increase in the value-added tax between 2010 and 2012 (from 16% to 21%) and wage income tax in 2010 had a significant impact on consumption.

The third period of economic growth that followed (2014-2019) was mainly led by the external demand, together with a moderated recovery of public and private autonomous demand. Exports contributed to growth almost the same as in the first boom. Consumption out of public wages and transfers also. These were followed by a partial recovery in private spending, with a more modest increase in residential investment. The role of direct public spending (excluding transfers and public wages) was also much smaller than in the previous boom. The supermultiplier again contributed negatively, with the increase in the propensity to import and a decrease in the wage share more than offsetting the recovery in the propensity to invest. In terms of the net contribution, the modest but positive contribution of respectively public, external and private sector explains the moderate recovery.

Figure 6: Average contribution to the growth of the aggregate demand of autonomous demand



4. A debate with the literature

4.1 The expansion of 1998-2007

Prior literature on the Spanish economy growth has tended to give a crucial importance to residential investment and consumption, conferring a great deal of importance to the credit boom and housing bubble to explain the economic

performance in this period. The mainstream view states that residential investment and households' consumption were boosted by low interest rates emerging from a 'regime of macroeconomic stability' and further pushed down by the ECB (Bank of Spain, 2004, pp. 15, 24, 2007, pp. 35–36; Malo de Molina, 2005). The important role of low interest rates on residential investment and households' consumption is also pointed out by heterodox authors, as Storm and Naastepad (2015) and Hein and Martschin (2021, p.513). Other factors that could explain the credit boom are the role of financial liberalization and large capital flows into peripheral euro countries on real estate (Rodríguez & Bustillo, 2008; Tilford & Whyte, 2011, Cesaratto, 2013; Stockhammer, 2016) and a credit-financed speculative process in which increases in house prices fed back on more credit through the revaluation of collaterals (Febrero & Dejuán, 2009, Febrero et al., 2019).

It is true that residential investment contributed much more to growth during the period 1998-2007 than the average of other periods, as we showed in our table 3. However, because the share of residential investment is much lower than of public sector demand and exports on autonomous demand, in the end the relative direct contribution was not the most important to explain the better growth performance of the Spanish economy in this period.

In fact, as we discussed, our results suggest prominent role for the public sector autonomous demand (this is in part due to adding consumption out of public income and public companies' investment to governments' spending, as well as not considering the increase in the tax revenues due to capital gains in the real estate boom as too contractionary).

In the literature, sometimes the analysis of the impact the public sector on growth is made looking to the budget balances, which leads to the conclusion that surplus primary balances are always contractionary. For example, Hein and Martschin (2021, pp.514, 517) use the cyclically adjusted budget balance as an indicator of fiscal impact and conclude that the fiscal stance in Spain was expansionary until 2004 and turned into contractionary between 2005-2007 when surpluses were run. Kohler and Stockhammer (2021, pp. 14–15) also account for the structural fiscal balance to capture the impact of discretionary fiscal policies and conclude that as Spain ran structural surplus in the period prior to the GFC yields, this would mean contractionary fiscal policy. The Bank of Spain uses the change in the cyclically adjusted primary balance as an indicator to fiscal impact, which followed an upward trend (from decreasing deficits to increasing surpluses), assessing the fiscal policy stance of this period as restrictive (Banco de España, 2017, p. 35; Malo de Molina, 2014b; Ortega & Peñalosa, 2012). An exception in the literature is the IMF (2006, pp.13-14), which stated that, in 2005, despite the government running a cyclically adjusted (overall) fiscal surplus, fiscal policy contributed positively to economic growth since 'public spending increases [had] a significantly larger expansionary impact on demand and the current account than the contractive impact of equivalent revenue gains.

Authors also have used net exports (or the current account balance) as an indicator of the contribution of the external sector to growth (Hein and Martschin, 2021, Bank of

Spain, 2007, p.106)¹⁷. Since increasing deficits were run, it was assessed that the contribution was negative. However, our growth decomposition considers that the impact of exports on demand is direct, while imports constitute a leakage from demand to output. Imports (and propensity to import) increased in the period, with a strong negative contribution to growth (-1.52%). But at the same time Spanish exports performed relatively well (at least, not worse than main advanced economies except for Germany, according to Myro, 2018)¹⁸. The contribution of exports to growth was 1.73%, higher than the negative contribution of imports, which shows that the overall contribution of the external sector was moderately expansionary.

Finally, although our results show a relatively small direct contribution of residential investment to growth, we can think in some feedbacks that can explain the overall impact of this variable in the economy. First, the real estate boom was important to the increase in tax revenues to GDP ratio of 4pp¹⁹, because of the rise in houses prices and transactions. These extraordinary tax revenues were important in enabling public administrations to increase spending besides the fiscal rules that came with the integration into the EMU. Despite the overall budget balance turned into a surplus position in the three last years (2005-2007), the overall net impact of the public sector, as we saw, was expansionary. These findings are in line with Serrano and Pimentel's (2019, p.4) extension of Haavelmo's take on fiscal policy, according to which 'even if a primary surplus has to be obtained, an increase in government demand financed by taxes can be expansionary, provided the primary surplus target' is 'smaller than the marginal propensity to save of the private sector'²⁰. In the Spanish case in the period under analysis, a large part of public revenue stemmed from the taxation of real state capital gains. Assuming that consumption induced by capital income is not significant and considering that primary surpluses were relatively small, we can conclude that the income redistribution led to a higher propensity to spend for the economy as a whole. Moreover, as Serrano and Pimentel (2019) claim, the expansionary effect is amplified by the increase in the supermultiplier stemming from the reaction of the propensity to invest to larger demand.²¹

4.2 Recession of 2009-2013

¹⁷ For a comparison of the results of contribution of the external and public sector to growth using the methods of national income and financial accounting decomposition, following the demand and growth regimes perspective with the autonomous demand (or supermultiplier) demand-led growth decomposition for the BRICS countries, see Campana et al (2022).

¹⁸ Evidence largely supports the fact that exports were not affected by the loss of competitiveness shown by the spreads in inflation rates and unit labour costs. For example, despite Spain's share in world exports decreased from 2004, it increased when considering the whole period (Febrero & Bermejo, 2013).

¹⁹ The European Commission estimates that between 50% and 75% was linked to the real estate boom (Martinez-Mongay et al., 2008), while the Bank of Spain's estimate is closer to the lower range of 50% (de Castro Fernández et al., 2008).

²⁰ See also Alain (2022) for the theoretical discussion on the interrelation between autonomous components of demand in a supermultiplier model.

²¹ Other interesting line of further investigation based on insights on the supermultiplier would be to check the empirical evidence on the importance of the public sector demand to sustain episodes of private autonomous demand boom and indebtedness. For a theoretical reference, see Pariboni (2006).

The Spanish recession, 2008-2013, in which the GDP contracted by almost 10%, is generally interpreted as a double-dip recession with a first phase initiated with the GFC and the burst of the housing bubble, and a second phase coinciding with the euro area debt crisis. The diagnosis of the causes of this recession are diverse. Some economists attributed the crisis to balance-of-payments problems (Bank of Spain, 2013, pp. 7, 59). Some focus on the role of financial liberalization to external imbalances and its effects on indebtedness of the non-financial corporate sector (Caldentey and Vernengo, 2018). Others believe that the credit crunch that triggered the crisis was related with the behavior of households in a context of balance sheet recession', such as Torrero-Mañas (2014), Álvarez-Peralta (2014), Febrero et al. (2019). These authors consider the recession as the result of a deleveraging process of the private sector following the burst of the housing bubble. Febrero et al. (2019) focus on the role of financial instability and the behavior of banks in contracting credit to the private sector as another important element for the crisis. Álvarez et al. (2018) point also to firms' deleveraging, affecting investment. For Febrero & Bermejo (2013) and Hein and Martschin (2021) the recession was later aggravated by fiscal consolidation, implemented through a mix of cuts in government's consumption, investment and wages and an increase on indirect taxes. Uxó et al. (2016) focus on the effect on households' consumption of the reduction of both the private wage bill (due to crisis in construction activity) and the public wage bill due to cuts and freezes of civil servant wages.

Considering the whole period of recession, our results are consistent with the importance of the credit-bust thesis, as the reduction in autonomous consumption and residential investment together have the most important contribution to reduce growth in the period 2008-2013. Additionally, the reduction in private induced consumption seems to be much more related with the fall in private wage share than in the propensity of consumption itself. The latter effect would be expected by the balance-sheet recession thesis, and our results don't support this thesis. However, we should add a caveat, as our propensity to consume is calculated as a residual, and we must interpret this result with some caution. Moreover, the important negative impact of the business investment share seems to be explained by the accelerator mechanism, as discussed in section 3. Although we do not deny possible short-run financial impacts on private business investments in the financial crisis, for the longer period of 2008-2013, the drop in private business investment seems to be compatible with a lower expected growth rate of effective demand.

Moreover, our results also support the importance of the public sector consolidation to reduce the growth rate of the economy. However, the negative contribution of the public sector to growth was a much smaller than the private sector. Finally, our results shows that the external sector contributed strongly to growth in the period, because of both to the fall in imports because of drop in aggregate demand (with an important role to the fall in business investment share) and the positive contribution of exports in the overall period. But that for an economy with an important internal market and

institutional setup of the public sector as it is Spain, the external sector alone seems not to be enough to lead a strong growth regime.

4.3 The recovery of 2014-2019

The recovery was a result of the continuation of the export growth followed by a slight recovery of both private and public sector autonomous spending. There is a debate on the role of external competitiveness, due to devaluations in the real wages, in driving exports and the recovery. Some authors believe that this was important to recovery, such as the Bank of Spain (2015, p. 23). Hein and Martschin (2021) state that besides the enhancement of price competitiveness, the external demand push resulted also from the recovery of economic growth in foreign countries. Other authors are more critical to the importance of price competitiveness to exports, and they reject the hypothesis that wage moderation had relevant effect in stimulating exports in Spain in this period (Cárdenas et al., 2020; Villanueva et al., 2020, Bilbao-Ubilos and Fernandez-Sainz, 2022)²².

Anyway, despite the causes of export growth, the result is that exports did contribute to growth in the recovery period. However, since imports also resumed because of the recovery of consumption and investment, the total contribution of the external sector to growth is indeed lower than in the previous recession period. Some authors call this experience of the recovery in Spain as weak export-led (Hein and Martschin, 2021).

Thus, we should add that another important contribution to growth in this period was the resumption of public demand, which although being more modest than in the previous boom, was positive, in contrast to the recession period. Finally, the return of the positive contributions of the autonomous consumption and residential investment is also important to explain the recovery. Some authors attribute the role of monetary policy stance on diminishing the burden of the private debt on households and its effect on the recovery of spending (Cárdenas et al., 2020). Finally, business investment also contributed positively to growth, as expected by the functioning of the accelerator mechanism and its impacts on business investment share when expected growth of effective demand is higher than in the previous period.

5. Conclusions

In this paper we analyzed the pattern of economic performance in Spain from 1998 to 2019 from a demand-led growth accounting perspective, based on the supermultiplier theory. Our general findings show that (i) public demand have an important contribution to autonomous demand in the Spanish economy, with the role of public wage and public transfers acting as an important stabilizing component to demand growth; (ii) exports also have an important contribution to autonomous demand in the

²² According to the Bank of Spain's (2017a) estimations, price competitiveness had even a lower contribution to the expansion of exports in the years following the 2012's labor market reform than in the years that preceded it.

Spanish economy, also acting as an important stable contribution to demand growth; (iii) residential investment and credit-financed consumption played an important role in the economic expansion of 1998 – 2008, not only because of the direct effect, but also through the indirect effect of increasing public revenues and discretionary public spending, with expansionary results to growth; (iv) the private business investment share is positively correlated with output growth, as predicted by the supermultiplier approach; (v) there is a downward trend of the supermultiplier during the whole period, mainly attributed to the continuous shrinkage of the private wage share, increasing propensity to import and lower private productive investment share (as a result of lower growth).

Our demand-led growth accounting exercise presented here helped us to show some general patterns regarding the contribution of induced and autonomous components of demand, and the relative importance of the institutional sectors to demand-led growth. This kind of accounting exercise, as we saw, should be integrated with other institutional, political economy and structural elements, with a prominent role for the macroeconomic policy stance, and complemented with further historic and empirical research.

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Annex I. Data sources

| Variable | Source |
|--|--------------------------------------|
| Main aggregates | |
| Aggregate income | INE |
| Consumption by households and non-profit institutions serving households | INE |
| Investment | INE |
| Government consumption | INE |
| Government investment | IGAE |
| Public companies' investment | IGAE |
| Exports | INE |
| Imports | INE |
| Auxiliary - investment | |
| Total residential investment | INE |
| Government residential investment | IGAE |
| Investment in non-residential constructions by real estate services sector | BBVA-IVIE |
| Private investment in R&D | INE |
| Auxiliary - consumption | |
| Consumption credit | Bank of Spain |
| Transfers to households | INE |
| Public wage bill | COFOG (INE) |
| Coefficients | |
| Average effective tax rate on wages | AEAT |
| Average effective tax rate on value added | AEAT |
| Adjusted wage share | European Commission's AMECO database |

INE: Spanish National Institute of Statistics

IGAE: Intervención General de la Administración del Estado

AEAT: Agencia Estatal de Administración Tributaria

IVIE: Instituto Valenciano de Investigaciones Económicas

Annex II – Estimation of incomplete and real series

Incomplete series

There are two series for which data is not available either in the first years and/or in the last years of our period (consumption credit and investment by public companies). Missing values have been filled by extrapolating these series using another series, both economically and statistically correlated, as reference. Statistical correlation is checked on growth rates for the years data is available for both series, at a level of confidence of 0.95. Denoting A the incomplete series and B the complete and correlated series, we run a linear regression of the growth rate of the incomplete series (g^A) on the growth rate of the complete one (g^B), as specified below (equation 14). The nomenclature is clarified in equation 15). Finally, we use the coefficient β obtained in the regression to extrapolate recurrently the incomplete series backwards (equation 16) and/or forwards (equation 17).

$$g^A = \alpha + \beta \cdot g^B \quad (14)$$

$$g_t^A = \frac{A_t - A_{t-1}}{A_{t-1}} \quad (15)$$

$$A_{t-1} = \frac{A_t}{(1 + b \cdot g_{t-1}^B)} \quad (16)$$

$$A_{t+1} = (1 + b \cdot g_{t+1}^B) A_t \quad (17)$$

For consumption credit, data previous to 2003 is not available. We have extrapolated the series backwards using consumption of durable goods as reference ($R^2=0.82$). In the case of investment by public companies, the data is only available between 2002-2017. We have, hence, extrapolated the series both backwards and forwards with the values of investment by public companies ($R^2=0.53$).

Estimation of real series

To estimate series in real terms we use, when available, the volume indexes at constant euros of 2015. For the remaining series, excepting households' consumption components different from credit-financed consumption, we use the deflators specified in table 4 below. For credit-financed consumption, the deflator is obtained by calculating the weighted average of volume indexes for the following items (using the COICOP framework): 4.3 Maintenance, repair and security of the dwelling, 5.1 Furniture, furnishings, and loose carpets, 5.3 Household appliances, 7.1 Purchase of vehicles, 9.1 Recreational durables and 9.2 Other recreational goods. For the remaining components of households' consumption, we use the following approach to estimate the overall real volume of consumption which emerge when applying a weighted-average deflator of non-durable goods and services. First, we estimate the propensity to consume as specified below, solving from equations 1, 2, 3 and 4 in section 2, using the series in nominal values to obtain the decomposed nominal consumption.

$$c = \frac{(C_H - C_{Cr})}{(1 - t_{VA})[Tr + (1 - t_w)W]}$$

Second, we subtract real credit-financed consumption from total real consumption. Third, we distribute the result between the remaining components of consumption accordingly to their relative shares over total nominal consumption. Fourth, we estimate the real series of consumption credit, transfers and public wages as showed below by solving from equations 2 and 3 in section 2, using consumption credit, transfers, and the public wage bill in real values.

$$Cr = \frac{C_{Cred}}{(1 - t_{VA})} \quad Tr = \frac{C_{Tr}}{c(1 - t_{VA})} \quad W_{pub} = \frac{C_{W_{pub}}}{c(1 - t_{VA})(1 - t_w)}$$

Finally, we recalculate propensity to consume as showed below, using C_I and Y in real terms, to avoid deviations of our estimation of total real consumption from the actual one as estimated in the national accounts.

$$c = \frac{C_I}{(1 - t_{VA})(1 - t_w)\omega Y}$$

Table 1: Deflators used for the estimation of real series (in euros of 2015)

| Variable | Deflator | Source |
|---------------------------------|------------------------------|---|
| Government investment | Gross fixed investment | Spanish Ministry of Finance's REMSDB database |
| Investment by public companies | Gross fixed investment | Spanish Ministry of Finance's REMSDB database |
| Public residential investment | Residential investment | INE |
| Private investment in R&D | Investment in R&D | INE |
| Credit-financed consumption | Consumption of durable goods | Own calculation from INE |
| Consumption out of transfers | | Calculated as described above |
| Consumption out of public wages | | Calculated as described above |
| Consumption credit | | Calculated as described above |
| Transfers | | Calculated as described above |
| Public wages | | Calculated as described above |