ECFIN *Country Focus*

ECONOMIC ANALYSIS FROM EUROPEAN COMMISSION'S DIRECTORATE-GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

HIGHLIGHTS IN THIS ISSUE:

- Imports have contracted significantly since the crisis

- The reduction in imports cannot be attributed to the contraction of final demand alone, but also reflects structural elements

- Gains in price competitiveness and the rebalancing of final demand towards exports must continue in order to ensure external sustainability

The contraction of imports in Spain: a temporary phenomenon?

*By Kristian Orsini**

Summary

Spain's imports of goods and services fell by almost 17 % between 2008 and 2013, led by non-energy imports which fell by nearly 20 %. As a result, Spain's current account balance swung from a deficit of 10 % to a surplus of 1.1 % in just six years.

Part of this remarkable change may be attributed to Spain's improved price competitiveness, which has led to a structural reorientation of the economy away from import-rich internal demand, and has prompted a process of import substitution. However the crisis-led contraction of internal demand is also likely to have contributed to the reduction in imports.

By analysing the relationship between Spain's imports and relative prices and by examining separately the effects of internal and external demand, this analysis shows that much of the fall in imports was driven by the fall of internal demand — although this was partly offset by an increase in external demand. The improvement in cost competitiveness also had a significant and, most likely, a lasting effect.

Another important reason for the fall in imports, however, is the short-term over-shooting of imports which followed from the fall in income. Spain's imports are therefore likely to recover some of their lost ground in the coming months — as we are indeed currently observing. Consolidation of the contraction in imports will depend on continued improvements in price competitiveness and on the consolidation of a growth model that is less dependent on domestic demand.

Economic and Financial Affairs

Spain's current account balance

In the two decades before the crisis, Spain registered persistent current account deficits

For almost two decades before the crisis, Spain's current account balance was regularly negative. The large current account deficits in the boom years of the previous cycle were mainly driven by trade deficits in goods (Graph 1) as buoyant domestic demand supported greater penetration of imports into the domestic market. In addition, in the absence of a national currency and sufficient macro-prudential controls, large capital inflows led to an increase in prices and wages. This resulted in a persistent positive differential between domestic inflation and import price inflation. Despite the resulting loss in price competitiveness, exports performed relatively well over the whole period — probably supported by non-price competitiveness gains and higher-than-average productivity among exporting firms (European Commission, 2014). Yet, by 2007, Spain posted a record current account deficit of 10 % of GDP.

The international financial crisis and the bursting of the housing bubble triggered a sharp adjustment

International and domestic circumstances contributed to a sharp contraction of imports in 2008: total imports (at constant prices) fell by almost 17 % between 2008 and 2013, whereas the non-energy imports fell by almost 20 %. The reduction in global trade triggered by the international financial crisis and the bursting of the housing bubble resulted in a prolonged double dip-recession, which only ended in the second quarter of 2013. The contraction of internal demand was particularly sharp and prolonged, also due to an unprecedented surge in unemployment.

Dynamic exports and subdued imports contributed to a positive current account balance in 2013

After an initial fall, external demand improved visibly. Due to the relatively high import content of exports, the negative impact of internal demand on imports was partly off-set. A particularly sharp acceleration began in 2012 at both the intensive (i.e. the volume exported by an exporter) and extensive margins (i.e. new exporters), as the non-price competitiveness gains recorded over the previous decade were supported by subdued domestic price and labour cost dynamics and a re-allocation of resources towards the tradable sector. The internal devaluation also contributed to import substitution: with more subdued domestic prices, firms and households started to substitute more expensive foreign goods and services for cheaper domestic ones (Graph 2).

Graph 1: Current account and gross components as percentage of GDP
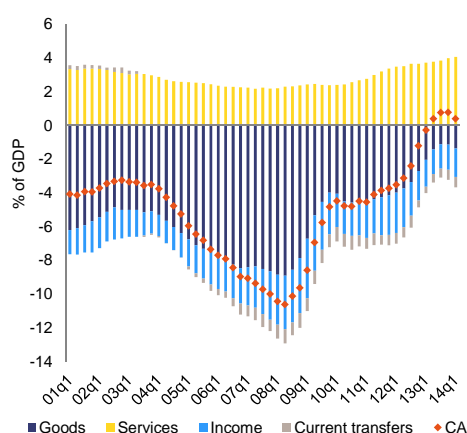
Source: Eurostat

Graph 2: Non-energy imports, final demand and price competitiveness (2008=100)
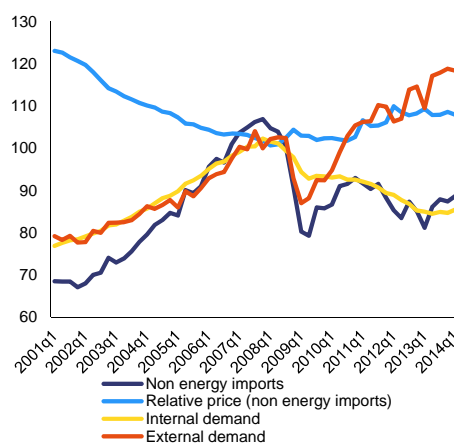
Source: INE, MEC, own calculations

Spain will need to register sizable current account surpluses in order to reduce its external liabilities

The correction in the current account was impressive. In 2013, Spain registered a surplus of 1.5 % of GDP. The current account surplus contributed positively to the reduction of the strong negative external investment position (almost 100 % of GDP by the end of 2013). Over the course of 2014, however, imports accelerated — casting some doubt on the structural nature of the adjustment, and rising concerns about the sustainability of the external position.

Against this background this Country Focus analyses the import dynamics in Spain. In particular, it tries to determine whether the correction in imports and in the current account balance can be explained by structural changes, which are lasting and able to ensure external sustainability. The analysis is based on relatively long quarterly series, though the discussion focuses on pre- and post-crisis developments.

The drivers of Spain's high import dependence

■ *Spain's high import dependence is largely structural*

Spain's economy is characterised by relatively high import dependence due to structural characteristics, such as its high dependence on imported oil, and the high elasticity of its imports with respect to final demand. The latter due to a high elasticity of imports with respect to domestic demand and the high import content of its export sector.

■ *Spain's external oil dependence is the result of limited domestic resources and a relatively energy-intense economy*

Energy products make up a substantial share of Spain's total imports. Under the combined effect of price and volume increases, the share of energy goods in total imports was above 15 % in 2013. According to the most recent data, Spain has an energy dependence rate of 78.1 %, substantially above the EU average of 54.8 %.[1] This high dependence on energy imports can be traced to the fact that Spain has both limited fossil fuel resources and a relatively energy-intense economy.[2]

Other structural characteristics also drive the relatively high import propensity of the economy. According to the Commission's 2014 In-Depth Review the import content of Spanish exports was increasing before the crisis and reached almost 30 % in 2008 (European Commission, 2014). The import content of exports decreased sharply in the wake of the crisis, although preliminary evidence suggests that, as trade resumed, the import content of exports increased again. According to the most recent calculations based on the WIOD database, the import content of exports in 2011 was at 29.7%. The corresponding figures for France, Italy and Germany were at 28.5%, 27.1% and 27.3% respectively.

■ *The highly-integrated external sector partially explains the strong import content of Spain's exports*

The higher import content of the export sector is reflected in the relatively high penetration of capital goods and especially intermediate goods. Several studies have highlighted the specificities of Spain's export structure: the Spanish economy is more specialised than other euro-area economies in sectors featuring relatively higher import content, e.g. the manufacture of motor vehicles, the chemical industry and the manufacture of machinery and electrical equipment. For several industries (and especially for the all-important automotive industry), import dependence may be explained by the relative weight of foreign subsidiaries. Finally, several studies have highlighted the positive relationship between the stock of FDI and the import-intensity of an economy and indeed Spain has by far the highest ratio of FDI stock to GDP among large euro area economies (almost 48 % in 2012).[3]

■ *Structural weaknesses and rapidly eroding competitiveness are likely to have favoured the penetration of imports in all sectors of the economy*

What is also striking is the speed at which the import content of exports has grown. By 2005, the import content of Spanish exports was greater than in large euro area Member States in almost all components of demand (only investment goods in Germany showed a higher import content). Cabrero and Tiana (2012) have suggested that, beyond export composition effects, inefficiencies in domestic markets have contributed to high import dependency of both households and companies (whether re-exporting or not).[4] In particular, structural weaknesses in the markets for factors and products have hindered the capacity of Spanish firms to compete with international firms in sectors where there is no strong home-bias competitive advantage and have limited the growth of domestic firms. These weaknesses facilitated the penetration of external competitors, especially in the pre-crisis boom when price competitiveness was eroded, though it is likely that reforms implemented since 2010 have helped improve the working of factor and product markets, with a positive impact on overall competitiveness (EC, 2014).

Econometric framework

■ *In order to focus on the price-sensitive components of imports, we model only the*

In order to appropriately measure the role played by domestic and foreign prices in the evolution of imports, we follow most of the empirical literature related to Spain and limit the analysis to the imports of non-energy goods and services.[5] The reason for doing so is that

■ *Error correction
models are
typically used to
model the short-
and long-term
relationship of
imports to prices
and final demand*

■ *We test for
structural
changes in long-
term elasticities
and for the
impact of
composition
effects in final
demand*

■ *Focusing on long-
term dynamics,
we find evidence
of lower
elasticities
following the
adoption of the
euro and, less
markedly, after
2008*

■ *The contraction of
imports below
what would be
suggested by
previous long-*

energy imports depend on structural characteristics of the productive system that cannot be easily altered in the short-run and are therefore relatively inelastic to changes in relative prices.[6]

Conventionally, import demand functions relate the aggregate volume of imports to the aggregate volume of demand and some measure of relative prices. The econometric specification relies on the following standard dynamic equation:[7]

$$\Delta M_t = a\Delta Y_t + b\Delta P_t + EC(M_{t-1} - \alpha Y_{t-1} + \beta P_{t-1}) + \varepsilon_t$$

where M_t, Y_t and P_t denote respectively aggregate imports, a measure of income (typically GDP or final demand) and a measure of relative prices (typically import prices relative to the CPI or the GDP deflator). The symbol Δ signifies the first order difference with respect to the same variable at time t-1. This class of models is typically referred to as Error Correction Models: the short-term dynamic of the dependent variable is linked to the *change* in the independent variables and to a partial correction of the gap between the *level* of the dependent variable in the previous period and its equilibrium value, with the speed of convergence being measured by the Error Correction (EC) coefficient. The equilibrium value of imports is defined by their long-term relation with the fundamentals — i.e. $\alpha Y - \beta P$. The above equation can be estimated in two steps through an OLS procedure — by regressing the *level* of imports on income and prices in the first step and plugging the (lagged) residuals in the dynamic equation in the second step. Alternatively, the equation can be estimated in a single step by non-linear maximisation techniques.

We allow for structural changes in the long-term parameters: these are endogenously identified by the data, rather than imposed ex-ante. Note that the possible presence of structural changes in the model bears no relation with the structural nature of the observed adjustment. Import contraction is defined as structural to the extent that it is not fully explained by the contraction of income. The presence of structural breaks, on the other hand, typically signals a change in the structure of the economy that is not explained by the model — possibly due to mis-specifications. To the extent possible, we extend the model and decompose final demand into its internal and external components and assess the role of the changing structure of final demand. This is based on the empirically-verified assumption that the elasticity of imports differs according to demand components (see for example Fernández and Sebástian, 1989 and Buisán and Gordo, 1997). This decomposition allows us to determine the extent to which the change in the structure of final demand contributed to lower imports.

Estimation results

In order to appreciate the impact of the different specifications, we first estimate the import function through a two-step approach that does not allow for structural breaks (Model I in Table 1). The long-term income and price elasticities are estimated at 1.9 and -0.8 respectively. Both estimates are consistent with recent and less recent literature, and suggest relatively high import dependence (when domestic demand goes up by one percentage point (pp.), imports go up by almost two pps).[8] On the other hand the price elasticity is close to unity. Also, the estimates of short-term dynamics are consistent with recent results, showing: a relatively strong short-term income elasticity (between 2.5 and 3); a price elasticity somewhat smaller than its long-term value; and a low speed of correction. Higher import elasticities and lower price elasticities in the short run are relatively standard, as they signal difficulty in swiftly adjusting to sudden changes in domestic demand or prices. The speed of the correction coefficient, signals how much of the imbalance in the long-term equation is corrected in each quarter, or alternatively, the speed at which the system returns to full equilibrium after a shock. A coefficient of -0.1 signals that about 10 % of the shock is corrected each quarter.

In the second model (Model II in Table 1), we test for endogenously-identified structural breaks following a two–step approach and relying on the Kejriwal and Perron (2010) test.[9] We identify three structural breaks, namely in Q1-1990, in Q3-1998 and in Q3-2008. The

term elasticities could be related to the sluggish adjustment process — rather than to lower elasticities following the crisis

first two breaks correspond to changes in monetary regimes, whereas the last one corresponds to the start of the financial crisis. The most significant break appears to be in 1998, when, after adopting the euro, imports became progressively less responsive to changes in income and changes in relative prices – possibly owing to increasing integration of the Spanish economy. In highly integrated economies, sensitivity to prices and income tend to diminish — also due to the higher share of non-finished goods that are core elements of domestic production. Focusing on the most recent structural changes, the results suggest that, following the crisis, both income and price elasticities further decreased in absolute value (from 1.43 and -0.42 to 1.36 and -0.37, respectively).[10] The structural break reflects a sluggishness in the behaviour of imports, since imports fell by less than expected on the basis of the structural parameters of the previous period, given that demand was falling and competitiveness improving.

Table 1: Estimates of short- and long-term income and price elasticities

Model I: Two steps equation - no breaks in long-term elasticities		Model II: Two steps equation - breaks in long-term elasticities		Model III: Single equation - breaks in long-term elasticities		Model IV: Single equation - internal and external demand	
Long-term equation							
Final demand							
1981Q1 - 2014Q1	1.866	1981Q1 - 1990Q1	2.189	1981Q2 - 1998Q3	2.218	Internal demand	0.679
	0.029		*0.024*		*0.048*		*0.063*
		1990Q2 - 1998Q3	2.208				
			0.046				
		1998Q4 - 2008Q3	1.426	1998Q4 - 2014Q1	1.564	External demand	0.423
			0.028		*0.053*		*0.036*
		2008Q4 - 2014Q1	1.355				
			0.227				
Price							
1981Q1 - 2014Q1	-0.841	1981Q1 - 1990Q1	-1.061	1981Q2 - 1998Q3	-0.856		-1.302
	0.023		*0.016*		*0.035*		*0.033*
		1990Q2 - 1998Q3	-1.101				
			0.032				
		1998Q4 - 2008Q3	-0.420	1998Q4 - 2014Q1	-0.293		
			0.017		*0.049*		
		2008Q4 - 2014Q1	-0.371				
			0.232				
Short-term equation							
Error Correction	-0.110		-0.494		-0.349		-0.187
	0.027		*0.105*		*0.068*		*0.037*
Final demand	3.322		2.923		3.416	Internal demand	2.549
	0.473		*0.364*		*0.233*		*0.270*
						External demand	0.708
							0.071
Price	-0.698		-0.764		-0.716		-0.730
	0.082		*0.086*		*0.047*		*0.032*
Constant	-0.008		-0.006		-0.447		1.031
	0.004		*0.003*		*0.098*		*0.220*
Adjusted R-squared	0.745		0.785		0.790		0.787
Durbin-Watson stat	2.724		2.232		2.704		2.706
Sum squared resid	0.098		0.083		0.078		0.079
Log likelihood	288.181		299.412		303.127		302.186

Note: Standard errors reported in small italic font under the estimated coefficients.

Source: Our calculations based on MEC, INE.

■ *When estimating short-term and long-term dynamics jointly, we find evidence of a structural break only in 1998*

The analysis of the short-term dynamics suggests a somewhat lower income elasticity than in the previous model (although still very high in absolute terms), whereas the price elasticity is more within the traditional bounds. The speed of correction, however, appears to be more rapid, which is a natural consequence of having multiple long-term relations. Several breaks in fact imply several long-term equations. Segmenting the whole period in several sub-periods characterised by different long-term equilibria automatically increases the fit of the mode and reduces the distance from the long-term equilibrium at any given point in time. Still, the model did not identify structural breaks in the way the economy adjusts in the short term.

We argue that in a dynamic system characterised by both short-term and long-term relationships between variables, there is a risk of over-predicting the number of structural breaks when testing separately for structural breaks in long-term and short-term relationships. Specifically, the risk is that short-term deviations from equilibrium are erroneously interpreted as structural changes in the long-term relationship, particularly if high volatility combines with a dynamic system characterised by short-term overshooting and sluggish adjustment — as the post-2008 dynamics in Spain seem to suggest.

■ *However, when further*

accounting for changes in the composition of final demand, we find no evidence of structural change in the behaviour of imports
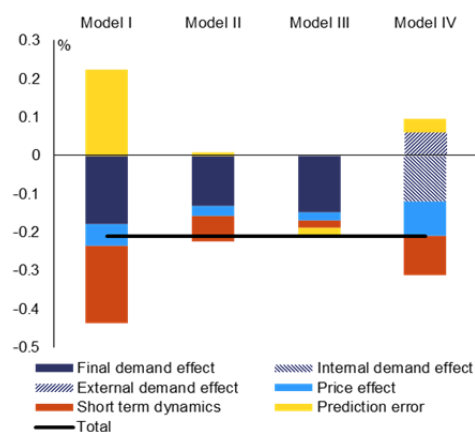
As a consequence, we adopt in Model III, a single-step equation approach allowing for the simultaneous modelling of short and long-term dynamics, but, relying on previous results, we allow for endogenous breaks in the long-term elasticities only. Only one of the structural breaks identified in the previous model survives, namely Q3-1998. The phase before 1998 is characterised by greater sensitivity of aggregate imports to both final demand and relative prices. With the adoption of the single currency, however, this sensitivity appears to be greatly reduced — consistently with what was found in the previous two-step equation. As before, we interpret this change through the greater degree of international integration, achieved after the adoption of the single currency. As regards the contraction, which occurred post-2008, the evidence suggests that it is broadly consistent with the long-term relationship of imports to the income and price dynamics following the adoption of the euro.[11]

It should be noted, however, that the standard errors of the estimated elasticities of the second sub-period in Model III are quite large — especially for price elasticity. This could be related to composition effects in final demand. If the hypothesis of greater international integration of the Spanish economy is true, controlling for a different composition of final demand could explain part of the change.

■ *Our preferred model suggests that the fall in internal demand contributed to about 50 % of the contraction in imports while gains in competitiveness contributed to about 40 %*

In Model IV, we propose an import equation in which final demand is decomposed in internal and external demand. As in the previous case, we allow for structural breaks in the long-term elasticities. Allowing for composition effects in final demand, we no longer find any structural break in the import function. The results indicate a significantly higher elasticity for internal demand (0.68) than for external demand (0.42) — which is consistent with previous results (e.g. Garcia et al., 2008).

At -1.3, the price elasticity is higher than previous estimates, though not extremely far from what was found in the first two sub-periods of Model II. Elasticities exceeding unity were also found in Busián and Gordo (1997). Moreover this result appears to be more consistent than previous estimates when read in conjunction with the short-term equation elasticity. In the short-term, price elasticity appears lower in absolute terms (-0.73), whereas demand elasticity (2.55 and 0.71 for internal and external demand respectively) is higher than the corresponding values in the long-term, which is consistent with economic theory. We also note that the error correction coefficient indicates a somewhat slower correction process — almost 20 % in every quarter.

■ *The rise in external demand offset 30 % of the fall in imports*

■ *A significant share of the reduction in imports is linked to short-term dynamics*

■ *A significant share of the adjustment in imports is structural*

Graph 3: Decomposition of the total reduction in imports between 2008q1 and 2014Q1

Source: INE, MEC, own calculations

Graph 3 decomposes the impact of the total reduction in imports between Q1-2008 and Q1-2014 in an effect due to the final demand effect, a price effect, short-term dynamics and a prediction error. According to Model I, a considerable share of the total reduction can be attributed to the fall in demand (almost 75 % of the total reduction). Note, however, that his model features a relatively large prediction error — which is a consequence of imposing a fixed long-term relationship between imports and fundamentals. The role of the price effect is relatively minor, in the order of 25 %. The short-term dynamics effect and the prediction error broadly offset each other. As one would expect, the prediction error in Model II is very small, which is a natural consequence of the higher flexibility derived by multiple breaks.

The demand effect explains about 60 % of the total reduction and the price effect less than 15 %. The rest is explained by short-term dynamics (essentially an overshooting of import contraction). The results in Model III are qualitatively not very different — though the fewer degrees of freedom affect the prediction error. Model IV, on the other hand provides a quite

■ *In the medium-term, however,*

imports are set to increase once again

different picture: external demand offsets about 30 % of the reduction in total imports, whereas internal demand contributes about 50 % of the reduction. Price effects also play a major role, contributing to about 40 % of the reduction. Another significant share of the reduction is driven by short-term dynamics, with the overshooting of the contraction being significantly higher than in previous models.

Conclusion

■ *Spain needs to strengthen external competitiveness and support the re-allocation of resources towards the tradable sector*

The sharp fall in imports observed since the outburst of the crisis does not appear to be driven by structural breaks in the behaviour of imports — at least once short-term overshooting, sluggish adjustment and changes in the composition of final demand are taken into account. The absence of structural breaks does not, however, mean that the adjustment in imports is not structural. A significant proportion of the fall in imports is underpinned by improved competitiveness and the rising importance of exports in final demand. Both phenomena are likely to have been supported by structural reforms that have enhanced price flexibility and allocative efficiency. As the economy becomes more geared towards external demand, the aggregate elasticity of imports with respect to final demand should fall and the behaviour of imports should become more correlated with exports than in the previous expansionary cycle. This should reduce the risk of persistent negative trade balances in the coming years.

About 40 % of the contraction in imports is nevertheless attributable to a short-term over-responsiveness of imports and it is likely that imports will increase again in the following quarters, as we indeed are currently observing. In order for the adjustment to endure, it is essential that price competitiveness is maintained or even strengthened and that the closure of the output gap does not alter the current structure of contributions of internal and external demand. This will require continued efforts to improve the efficiency of domestic goods and service markets, thus complementing the significant wage adjustment already achieved, and especially the removal of barriers to growth for firms, which is often crucial for penetrating external markets.

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[1] The energy dependence rate is defined as net imports (imports minus exports) of energy divided by gross energy consumption and expressed as a percentage. The figures refer to 2012.

[2] Final energy consumption in Spain increased significantly between 1990 and 2007 (71.7 %), although it contracted considerably between 2007 and 2013 (-15.2 %) on the back of falling output and GDP. Transport is the greatest energy-consuming sector, with 40.1 % share of total final energy consumption in 2013 (above the EU-28 average of 31.8 %). Industry is another important energy-consuming sector. At 25 % the share of industry in total consumption is comparable to the EU average, despite the lower weight of industry in total value added. Oil dominates in terms of the type of energy consumed (more than 40 %), with a significant contribution also by natural gas. Energy from domestic sources includes renewables and solid fuels — which jointly account for about 25 % of gross inland consumption. The high external energy dependence partially limits the scope of reducing imports, although a more environmentally-friendly taxation could encourage greater efficiency, especially in the oil-hungry transport sector.

[3] See for example Camarero and Tamarit (2004) and the literature cited therein.

[4] The authors suggest that as in the case of limited penetration in foreign markets, high import dependence may be linked to insufficient size of enterprises and limited investment in R&D.

[5] The inclusion of categories of imports that are not or are differently affected by the fundamentals would distort the estimates of the coefficients. Most literature for Spain follows a similar approach; see Montañés and Sanso (2000) for a review and Garcia et al. (2008) for a recent application.

[6] The lack of disaggregated energy and non-energy data on imports in the quarterly national accounts means that we have to rely on customs data. The monthly series of energy goods from customs data (both in current and fixed prices) is transformed into quarterly frequency by simple aggregation and seasonal adjustment, relying on the TRAMO/SEAT filters. The series so obtained is subtracted from total imports (also seasonally adjusted) in order to derive a series for non-energy imports. By combining quarterly national accounts and custom data, we are able to reconstruct a consistent series since 1981. We proxy the income aggregate using final demand — that is GDP plus total imports. By taking the ratio of the nominal and real series, we construct an implicit deflator. We also construct an implicit deflator of final demand by taking the ratio of the nominal to the chain-linked value. The ratio of the implicit non-energy imports deflator to the implicit final demand deflator is our measure of price competitiveness. Both dependent and independent volume variables are expressed as chained-linked volumes, indexed to 100 in 2008 and expressed in natural logarithms. The ratio of non-energy import prices to the final demand deflator is also scaled to 100 in 2008 and expressed in logarithms. This transformation effectively allows us to interpret the coefficients as elasticities.

[7] Econometrically, the estimation of this class of functions is rendered difficult by the fact that typically aggregate volume series are not stationary, but tend to drift along a common positive long-term trend. However, an OLS estimation provides unbiased estimators of coefficients, provided that the series are co-integrated — i.e. that the linear combination of dependent and independent variable is non-stationary. Note however that estimates do not follow a normal distribution. Standard inference techniques cannot therefore be applied. Eliminating the trend, by taking the first-order differences, eliminates the incidence of spurious correlation, but, by focusing on the short-term relationship between the variables, fails to address their long-term relationship. Error-correction models are dynamic systems whereby the deviation of the current state from its long-run relationship feeds into the short-run dynamics. Specifically, the short-term dynamics of the dependent variable are determined by the change in the independent variables and by a correction of the gap between the dependent variable in the previous period and its steady-state value.

[8] Recent estimates by BBVA Research (2013) also place the long-term elasticity in this range (1.7 and -0.7, for income and price elasticity respectively). These estimates also lie between the estimates provided in the separate models for goods and services by Garcia et al. (2008) from the Bank of Spain, namely 2.2 and -0.6 for the income and price elasticities for goods and 1.7 and -0.7 for the income and price elasticities for services. See also Montañés and Sanso (2000) for an extended review of less recent estimates.

[9] The approach of Bai and Perron (2003) is a generalisation of the endogenous identification of a single break-point. In its basic form, one tests against a single-shift alternative of unknown timing. Tests against this alternative are usually based on a sequence of F statistics constructed on the sum of residuals of the segmented and non-segmented regression. Kejriwal and Perron (2010) extended the framework to non-stationary series.

[10] Similar breaking points and long-term elasticities are found in BBVA Research (2013). Note however that the authors detect a structural increase in the price elasticity following the 2008 crisis. The endpoint of their analysis is nevertheless the second quarter of 2013 and does not include recent increases in imports. When the series is limited to the second quarter of 2013, estimates converge. Specifically, in that study, the income elasticities are 1.99, 2.31, 1.42 and 1.42, while the price elasticities are -.90, -1.19, -.41 and -.43 for the periods 1986q1-1990q3, 1990q4-1998q2 and 1998q3-2008q3 and 2008-q3-2013q2, respectively.

[11] The single equation model also proves to be much more stable. Having a large number of structural breaks is problematic if the last identified structural break is shortly before the end of the series since it implies an over-reliance on very recent information. Including and excluding the last four quarters leads to significantly different results under Model II and Model III. In both cases the break points are not affected by the exclusion of the last four observations. However, the estimated coefficients change radically: in particular by limiting the endpoint of the observations to 2013q1, we see that under Model II both price and income elasticities are higher than before the break. When including the last four observations, both elasticities are smaller in absolute values. This excessive reliance on recent observations is an unattractive feature of the model. On the other hand, the elasticities of Model III were hardly affected by including the last four observations.