

3 CURRENT ACCOUNT ADJUSTMENT

Summary

The current account balance of the Spanish economy has improved by 11.6 pp since the onset of the crisis, from a deficit of 9.6% of GDP at the end of 2007 to a surplus of 2% in 2016. While all the headings have contributed positively to this adjustment, the correction of the net non-energy goods balance (5.7 pp) and of the investment income balance (2.5 pp) is most notable. The energy balance and the other services balance each contributed an adjustment of 1.3 pp of GDP. Finally, the tourism services surplus rose by 0.6 pp.

The analysis in this chapter shows that approximately half of the current account adjustment can be explained by cyclical economic developments and the fall in oil prices. Other factors contributing to the correction of the external balance include most notably the adjustment in public finances, population ageing, lower growth expectations and the gains in competitiveness of recent years.

The fiscal consolidation, population ageing and lower growth expectations make for a persistent weakness in domestic demand, which, in conjunction with the improvement in competitiveness, has contributed to raising the structural growth rate of exports, against a background in which Spanish firms are seeking new markets outside Spain. These same factors (especially the gains in competitiveness) have also contributed to the lower dynamism of imports in structural terms, partly offset by the vigour of exports in firms and sectors with a high import content.

The external vulnerability of the Spanish economy can be expected to decrease gradually over the coming years. Nevertheless, the risks associated with the high external indebtedness, which manifest themselves as a negative net IIP of 85.7% of GDP, highlight the need to run current account surpluses on a sustained basis in the future. Achieving this will require contributions from the structural consolidation of public finances and from the reform of factor and product markets to encourage productivity growth and to put the gains in external competitiveness on a firmer footing.

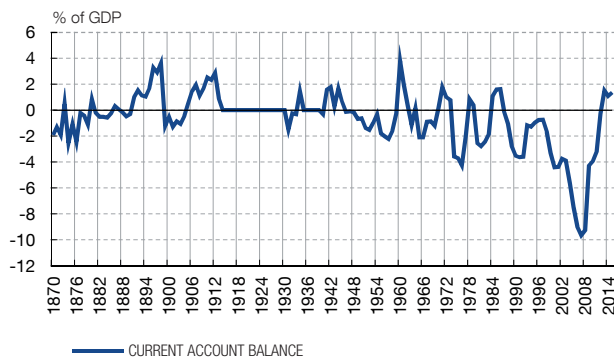
1 Introduction

Since the onset of the crisis, the Spanish current account balance has undergone a sharp adjustment. In the years preceding the global financial crisis, the Spanish economy recorded current-account deficits of a size unprecedented in the historical time series (see Chart 3.1). The financing of these deficits raised Spain's external debt to a very high level. Thus the negative net international investment position (IIP) increased by 45 pp of GDP between 2000 and 2007. Subsequently, the current account balance improved notably. Specifically, after worsening by 6 pp between 2000 and 2007, there was a correction of some 12 pp of GDP between 2008 and 2016.

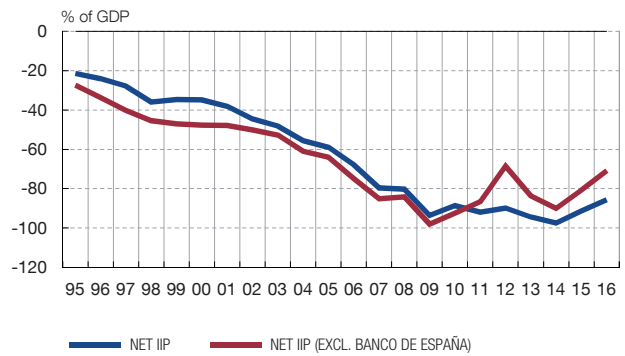
Sluggish domestic demand, improved competitiveness, the ongoing lax financial conditions, cheaper oil and fiscal consolidation are some of the factors explaining the improvement in the external balance. During the upturn before the crisis broke, the overly optimistic growth outlook, the build-up of losses in competitiveness and the availability of abundant financing under accommodative conditions were instrumental, among other things, in the deterioration of the current account balance of the Spanish economy.¹ The abrupt correction of the growth outlook and unit labour costs from 2009

¹ See J. M. Campa and Á. Gavilán (2011), «Current accounts in the euro area: An intertemporal approach», *Journal of International Money and Finance*, 30, pp. 205-228, and K. Adam, P. Kuang and A. Marcet, (2012), «House Price Booms and the Current Account», in *NBER Macroeconomics Annual*, University of Chicago Press, vol. 26, pp. 77-122.

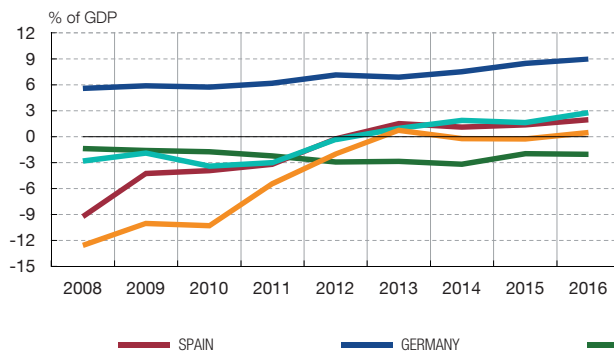
1 CURRENT ACCOUNT BALANCE (a)



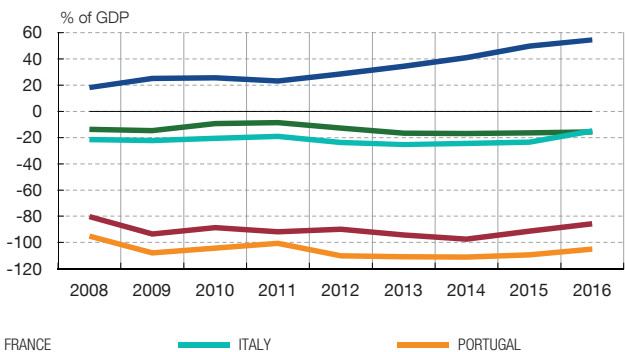
2 NET INTERNATIONAL INVESTMENT POSITION (IIP)



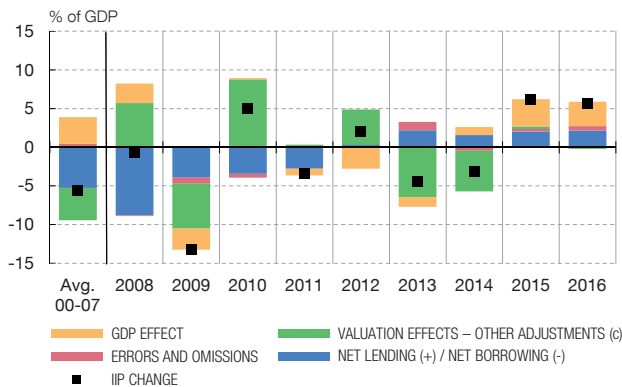
3 CURRENT ACCOUNT BALANCE. INTERNATIONAL COMPARISON



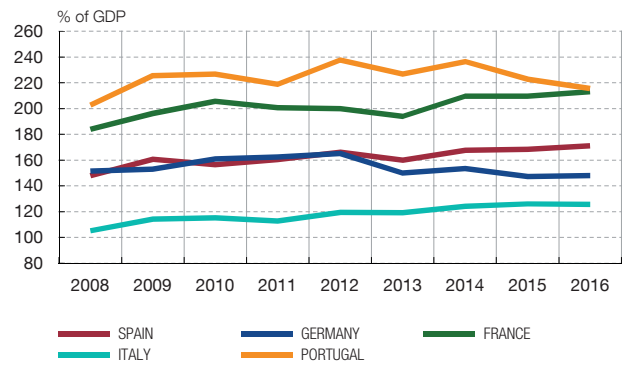
4 NET IIP. INTERNATIONAL COMPARISON



5 BREAKDOWN OF CHANGE IN NET IIP (b)



6 GROSS EXTERNAL DEBT. INTERNATIONAL COMPARISON



SOURCES: Banco de España, INE, national sources and Datastream.

- a Current account balance data for the period 1870-1995 drawn from the database: Òscar Jordà, Moritz Schularick and Alan M. Taylor (2017), "Macrofinancial History and the New Business Cycle Facts", in *NBER Macroeconomics Annual 2016*, vol. 31, edited by Martin Eichenbaum and Jonathan A. Parker, Chicago, University of Chicago Press.
- b A positive (negative) sign denotes an increase (decrease) in net IIP.
- c Valuation effects are gains/losses relating to the exchange rate and/or financial instrument prices, while other adjustments are other changes in volume, including most notably write-offs owing to recognition of the impossibility of recovering funds, asset and/or liability reclassifications, and changes in residence of holders or issuers of financial assets and liabilities.



was conducive to the improvement of the external balance. Subsequently, from 2013, the narrowing of the spread on interest rates applied to resident agents relative to with those of the euro area core countries allowed the Spanish economy to gain competitiveness (see Chapter 2 of the 2015 Annual Report of the Banco de España) and reduce net payments of interest to the rest of the world, since Spain is a net debtor economy. Also, following the sharp deterioration of the public deficit between 2007 and 2009, the process of fiscal consolidation under way made for a more positive trend in national saving. Finally, the process of adjustment of the external deficit was driven by factors of a more temporary nature, such as the collapse of economic activity in the more deeply recessionary phases of the crisis and the fall in oil prices, which dropped from €86 to €24 per barrel between January 2012 and January 2016, notably reducing the energy bill.

Despite the recent improvements in the external balance, the still-high external debt represents one of the main vulnerabilities of the Spanish economy. At the end of 2016, the negative net IIP stood at 85.7% of GDP, among the highest of the advanced economies (see Chart 3.1). Meanwhile, the gross external debt, which encompasses callable liabilities, amounted to 167.5% of GDP. Against this background, a worsening in the conditions of access to financing from the rest of the world may affect macrofinancial stability despite the recent shift in the composition of callable liabilities towards longer maturities. Mitigating this element of risk will require current-account surpluses to be run for a long period of time.

This chapter analyses the recent correction of the external deficit and its determining factors, with the aim of gauging how persistent it will be. The ability to quantify the various factors behind the current account adjustment allows us to determine to what extent we can expect the recent correction of the external balance to be lasting, and to thus roughly estimate the future vulnerability of the Spanish economy under alternative scenarios for the behaviour of its external net borrowing.

2 Characterisation of the correction of the external balance

The net borrowing or lending of a nation is determined as the sum of the current account balance and the capital account balance. The current account is divided into four basic sub-balances:² goods (exports and imports), services (including payments and receipts derived from tourism and non-tourism services), primary income (including, inter alia, interest payments and receipts on liabilities and assets, respectively, vis-à-vis the rest of the world) and secondary income (including, among other items, payments and receipts of migrants' remittances). The capital balance, which in relative terms is smaller, is basically determined by capital transfers to and from the EU. Described below are the changes in the aforementioned headings from 2000, paying special attention to the period after 2008. Since all transactions recorded in the balance of payments have a financial counterpart, Sub-section 2.2 analyses the financial account.

2.1 CURRENT ACCOUNT AND CAPITAL ACCOUNT BALANCES

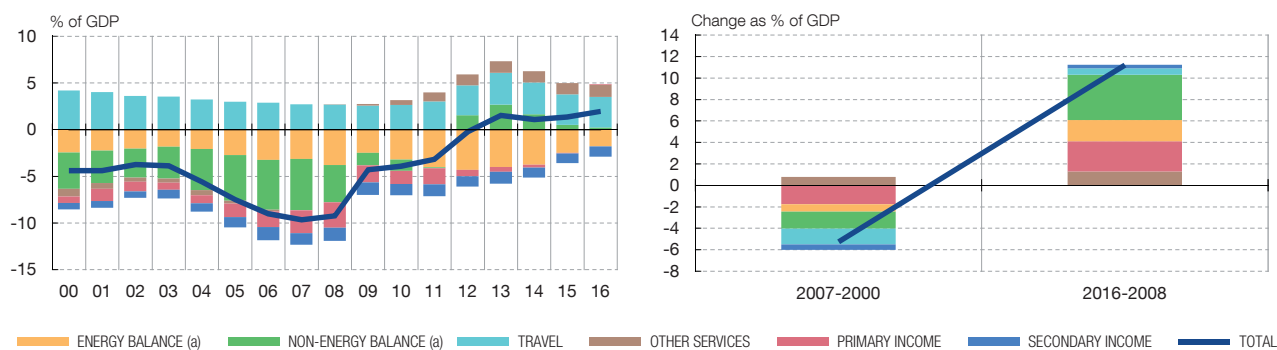
The current account balance of the Spanish economy deteriorated by 6 pp of GDP between 2000 and 2008 due to the worsening of all its headings, particularly net purchases of non-energy goods. During the upturn before the crisis, the Spanish economy built up an external imbalance which reached nearly 10% of GDP in 2007 (see panel 1 of Chart 3.2). Except for a surplus on services (2.7% of GDP in 2007), all headings had negative net balances throughout the period 2000-2007, the most notable being the deficit on non-energy goods at 5.5% of GDP in 2007. The negative contribution to the current account by

² See the "Balanza de Pagos y Posición de Inversión Internacional de España, 2014", published by the Banco de España.

CURRENT AND CAPITAL ACCOUNT BALANCES

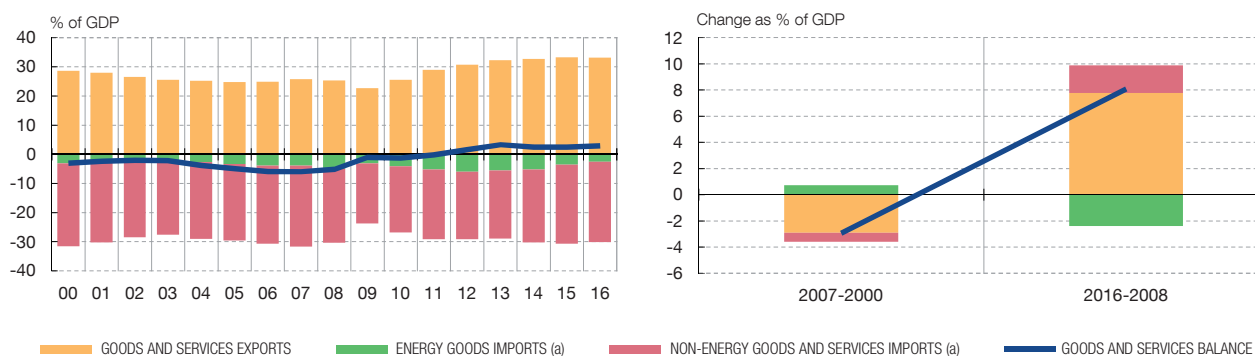
CHART 3.2

1 CURRENT ACCOUNT. BALANCES



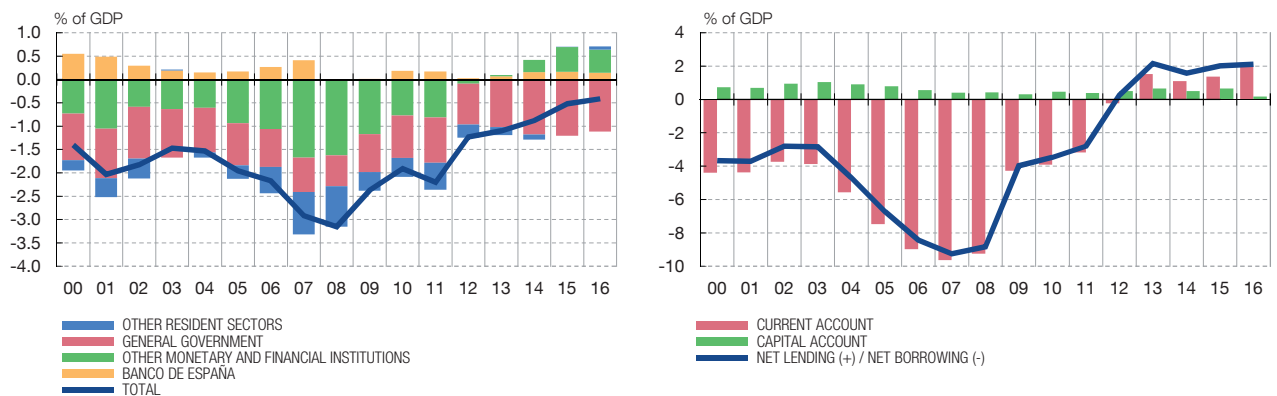
2 CHANGE IN CURRENT ACCOUNT BALANCE

3 GOODS AND SERVICES. BALANCES



4 CHANGE IN GOODS AND SERVICES BALANCE

5 INVESTMENT INCOME. BALANCES



SOURCES: Banco de España and INE.

a Energy and non-energy balances are estimates by the Banco de España using Customs data.



deficit items increased in this period, particularly that by net imports of both energy and non-energy goods, which rose by 0.7 pp of GDP and 1.6 pp of GDP, respectively.

Since 2008 the current account balance has improved by around 12 pp of GDP, again due to the behaviour of all its headings, particularly purchases of non-energy goods and the income balance. In this period, the Spanish economy abruptly corrected its external imbalance and reached a current account surplus of 2% in 2016. This is particularly notable because since 2014 external surpluses have coexisted with significant positive GDP growth, although traditionally recoveries of the Spanish economy have been associated with a worsening of the external balance. Since 2008 all headings have contributed to the correction of the current account deficit, although they have done so unevenly, with the non-energy goods and primary income balances being the main contributors (see panel 2 of Chart 3.2).

At first the adjustment was mainly through the reduction of non-energy goods imports, which was subsequently reinforced by an improvement in exports as a whole. The improvement in the trade balance reflected the adjustment of the net balance of non-energy goods, which went from a deficit of 5.5% of GDP in 2007 to a surplus of 0.2% in 2016 (see panels 3 and 4 of Chart 3.2). Initially, between 2008 and 2010 the correction was due to a sharp contraction of imports, to which was subsequently added a recovery of exports, whose weight relative to GDP reached percentages exceeding those before the crisis. Despite the substantial oil price rises from \$30 per barrel in 2000 to \$146 in 2008, the energy goods balance showed very limited changes in the pre-crisis period, as a result of the Spanish economy's notably lower dependence on oil in this period (see Box 3.1). The continued improvement in energy efficiency and the recent fall in oil prices meant that in the last two years this component has contributed significantly to improving the current account balance, as the energy bill fell by 2 pp of GDP, to a deficit of 1.8% in 2016. Meanwhile, the improvement in the services balance was due to the buoyancy of tourism exports, partly as a result of geopolitical tensions in various competitor destinations,³ and to the growth of exports of other services. However, as a whole, the widening of the services balance surplus (1.9 pp of GDP between 2008 and 2016) contributed less than the correction of the goods balance (5.7 pp of GDP between 2008 and 2016) to the adjustment of the current account.

The investment income balance also improved significantly in the period 2008-2016.

Specifically, the investment income deficit decreased in this period by 2.7 pp of GDP to 0.4% in 2016 (see panel 5 of Chart 3.2). This improvement reflected the decrease in interest rates in the period considered and the changes in composition of external liabilities by institutional sector. Specifically, the relative weight of government debt held by non-residents, the financing cost of which is generally lower than that of private-sector debt securities, increased. Also, the process of deleveraging undertaken by the private sector gave rise to an appreciable decrease in the associated net interest payments, to the point that surpluses of around 0.6% of GDP were recorded in 2016, contrasting with the deficit of 2.5% of GDP in 2008.

The role of the capital account in the adjustments seen in recent years has been secondary. The surplus on the capital account, which is basically determined by capital transfers to and from the EU, was relatively steady from 2000, so its contribution to the correction of the external balance was marginal (see panel 6 of Chart 3.2).

³ See Box 7 "Dynamism of non-resident tourism in 2016 and its determinants", in "Quarterly report on the Spanish economy", *Economic Bulletin*, 1/2017, Banco de España.

In the years preceding the crisis, the balances of financial transactions with the rest of the world became progressively more negative. This was the result of net investment in Spain by non-resident agents (net change in liabilities or NCL) which increasingly outstripped residents' investment in the rest of the world (net change in assets or NCA) (see panels 1 and 2 of Chart 3.3). In the expansionary period prior to the crisis, the NCL was due mainly to the receipt of funds by monetary financial institutions (MFIs) and by securitisation special purpose vehicles to meet the financing needs of the private sector⁴ (see panels 3 and 4 of Chart 3.3). Moreover, direct outward investment by Spanish firms exceeded the inward investment by foreign firms in Spain, this being a key component of the NCA during those years (see panels 5 and 6 of Chart 3.3).

From the onset of the crisis, the flows of investment and borrowings abroad decreased considerably. Both the flows of borrowings and the flows of investment decreased from the onset of the crisis. However, the NCL decreased more sharply than the NCA. This resulted in the NCA being larger than the NCL from 2012 (see panel 2 of Chart 3.3), giving rise to a positive balance in the financial account which has persisted in the last four years. Although the inflows and outflows recovered in 2014 and subsequent years, their composition differs from that before the crisis. Thus, regarding institutional sectors, other resident sectors (ORSs), which were net recipients of funds in the pre-crisis years, became net investors abroad after the crisis. For its part, general government, as a result of the ongoing high government deficits, had to raise funds which were partly financed by international investors through portfolio investments.

From 2010, financial flows to and from the rest of the world were strongly influenced initially by the financial tensions in the euro area and subsequently by the extraordinary measures of the ECB. The financial tensions in the euro area between 2010 and 2012 generated net outflows of funds abroad in the sectors other than the Banco de España, amounting to 15% of GDP in 2012, and a considerable increase in the central bank's net liabilities as a result of the growing need of Spanish financial institutions to supplement the funding from the financial markets with funds from the Eurosystem.

From 2013, the resident sectors' improved conditions of access to external financing allowed the outflow of foreign funds to be reversed. The progressive normalisation of the euro area capital markets from late 2012 significantly mitigated the need for Spanish banks to resort to central bank funding. Subsequently, the abundant liquidity resulting from the unconventional quantitative easing measures by the ECB in recent years has again prompted net outflows of funds in the Spanish economy, albeit of a very different nature from those produced by the 2012 balance of payments crisis. In fact, the recent outflows of funds do not reflect a worsening of economic sentiment towards the Spanish economy, as in 2011-2012, but rather result from a redistribution among institutions and countries of the abundant liquidity injected by the Eurosystem.⁵

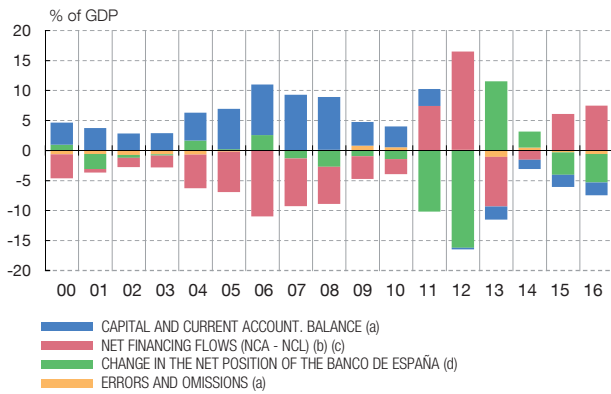
3 Analysis of the persistence of the recent current account adjustment

In analysing the determinants of the external imbalance, it is useful to distinguish the contribution of temporary factors from that of longer-term factors. Various international organisations, such as the International Monetary Fund and the European Union, have adopted a methodology which enables them to decompose the adjustment of the external sector according to the effect of various explanatory factors on agents'

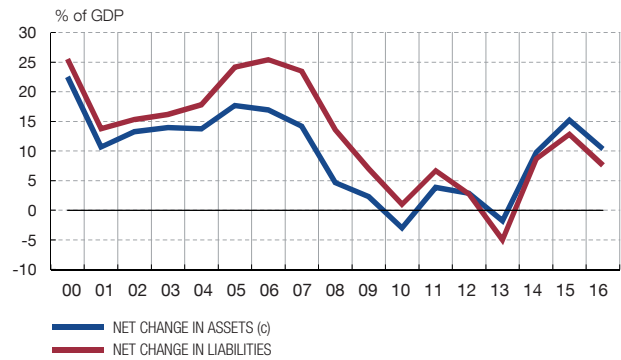
⁴ Classified in other resident sectors (ORSs).

⁵ For more details, see J. Martínez Pagés (2016), «The Eurosystem quantitative easing measures and the financial account», *Economic Bulletin*, April, Banco de España.

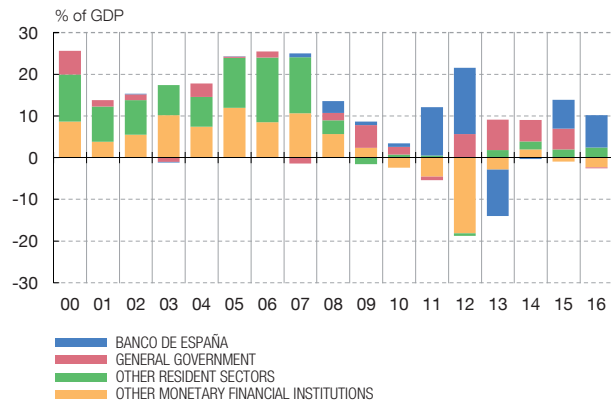
1 CAPITAL AND CURRENT ACCOUNT BALANCE AND CROSS-BORDER FINANCIAL TRANSACTIONS



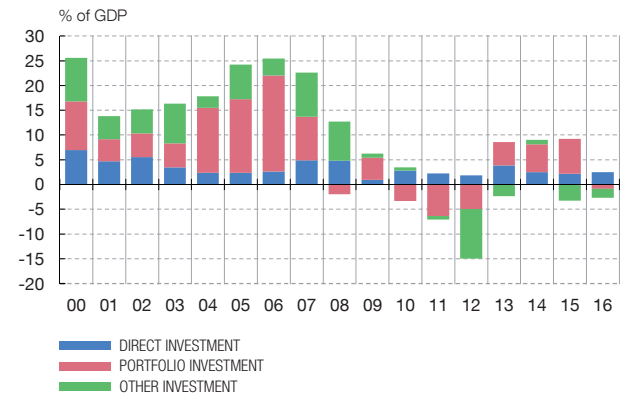
2 NET CHANGE IN ASSETS AND NET CHANGE IN LIABILITIES



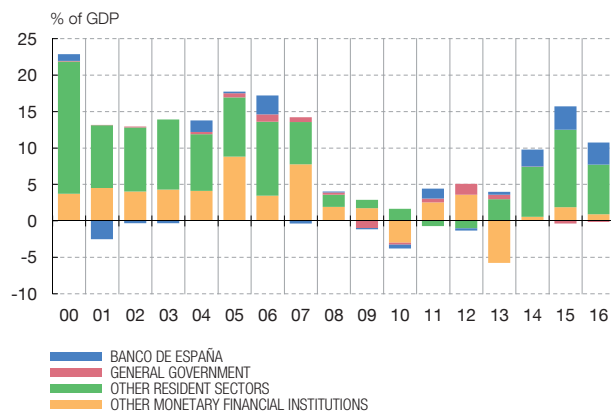
3 NET CHANGE IN LIABILITIES. SECTORIAL BREAKDOWN



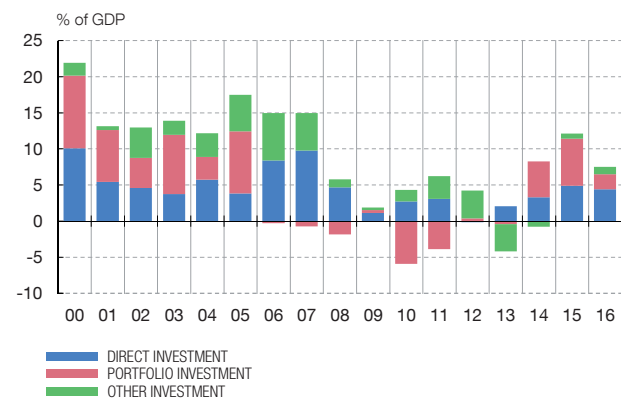
4 NET CHANGE IN LIABILITIES (EXCLUDING BANCO DE ESPAÑA). BREAKDOWN BY FUNCTIONAL CATEGORY



5 NET CHANGE IN ASSETS. SECTORIAL BREAKDOWN



6 NET CHANGE IN ASSETS (EXCLUDING BANCO DE ESPAÑA). BREAKDOWN BY FUNCTIONAL CATEGORY



SOURCE: Banco de España.

- a Sign changed.
- b Excluding Banco de España.
- c Financial derivatives are accounted for in net terms (NCA - NCL) and, by convention, are assigned to the net change in assets
- d Change in assets minus change in liabilities. A positive (negative) sign denotes a decrease (increase) in the net external assets of the Banco de España.



savings and investment decisions and on the behaviour of net exports.⁶ This focus enables the determinants of a cyclical, and therefore temporary, nature to be distinguished from other factors. This section considers a variant of this methodology which includes a broader set of determinants of the external balance in order to approximate the specific features of the euro area and particularly of the Spanish economy.⁷

Notable among the temporary factors is the role of the business cycle. The sluggish domestic demand during a recession means that imports fall and exports rise, which helps to improve the trade balance and, therefore the current account balance. However, this effect can be expected to reverse as the cyclical upturn gets underway and the output gap becomes positive.

Oil prices may play a significant role in the behaviour of the external balance. Cheaper oil prices helped to reduce the energy balance in countries which are net importers, such as Spain, where the energy component represents a significant part of the current account balance. The degree of temporariness of oil price changes is difficult to identify a priori, although the high volatility of this variable in certain periods would advise against considering it to be an explanatory factor of the current account balance of a structural nature.

Other longer-term factors, such as fiscal consolidation, gains in competitiveness, population ageing and lower growth expectations, may also help to correct the external balance. Lower borrowing by general government contributes to correcting the external deficit through its negative effect on domestic demand. Population ageing may foster agents' saving insofar as people perceive, for example, the need to top up their pensions under the government system. Also, weak potential growth expectations may entail low investment rates and, therefore, less borrowing. Finally, gains in competitiveness from, for example, the adjustment of labour and financial costs allow firms to compete internationally on better terms and increase their exports.

It is estimated that around one-third of the adjustment in the external balance between 2008 and 2015 was due to cyclical economic developments (see panels 1 and 2 of Chart 3.4). Thus the cyclically adjusted current account balance, i.e. after stripping out the effect of the contraction in activity, amounted to a deficit of 0.2% of GDP in 2015, compared with the deficit of 6.9% in 2008 (see panel 2 of Chart 3.4).

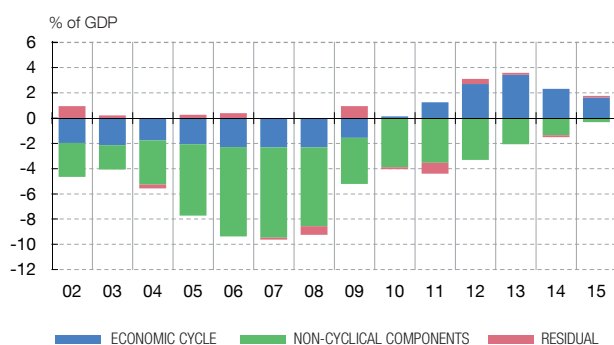
The fall in oil prices in recent years also contributed significantly to the correction of the external balance. Euro-denominated oil prices decreased by 73% between 2012 and 2015, which explains around one-fifth of the correction in the current account balance in that period (see panel 4 of Chart 3.4). In this case, although the oil price recovery is uncertain, it does not seem likely that there will be additional falls contributing to further decreases in the energy bill of the size of those seen in the period 2014-2015.

Fiscal consolidation stands out among the other factors which have contributed to the external balance adjustment. The structural component of the budget deficit decreased by 5.3 pp from 2010 to 2015. The contribution of this improvement in the public

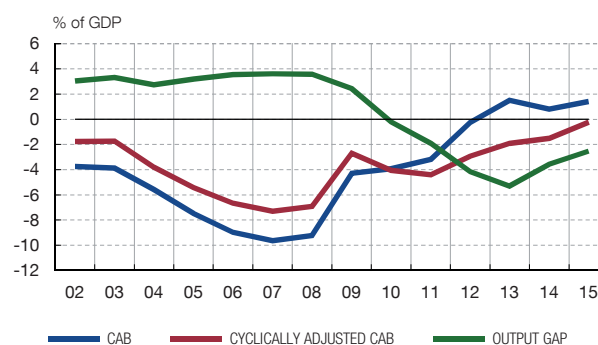
⁶ See IMF (2013), "The External Balance Assessment (EBA) Methodology", Working Paper 13/272.

⁷ E. Moral-Benito and F. Viani (2017), "An anatomy of the Spanish current account adjustment: the role of permanent and transitory factors", Working Paper, Banco de España, forthcoming.

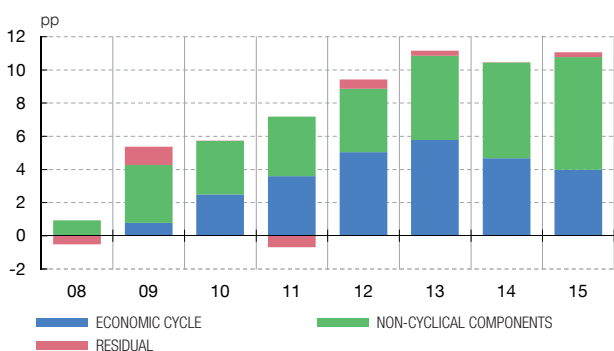
1 BREAKDOWN OF CURRENT ACCOUNT BALANCE (a)



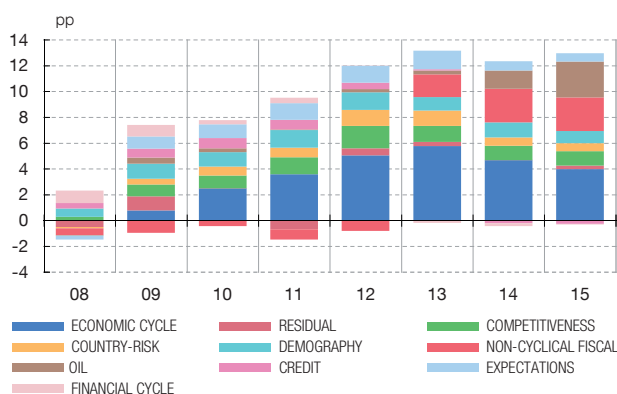
2 CYCLICALLY ADJUSTED CURRENT ACCOUNT BALANCE



3 CUMULATIVE ADJUSTMENT OF THE CURRENT ACCOUNT BALANCE 2008-2015 (b)



4 DECOMPOSITION OF CUMULATIVE ADJUSTMENT IN CURRENT ACCOUNT BALANCE 2008-2015 (b)



SOURCE: E. Moral-Benito and F. Viani (2017) *An anatomy of the Spanish current account adjustment: the role of permanent and transitory factors*, Working Paper, Banco de España, forthcoming.

- a The decomposition is based on a regression of the current account balance on a number of cyclical and non-cyclical factors. Specifically, cyclical factors include output gap (economic cycle) and financial market volatility proxied by the VIX index (financial cycle). Non-cyclical factors include unit labour costs and financing costs proxied by long-term interest rates (competitiveness), institutional quality proxied by the *International Country Risk Guide* survey (country risk), population ageing (demographics), the cyclically-adjusted fiscal balance, oil prices and energy dependence (oil), private credit growth (credit) and medium-term GDP growth forecasts (expectations).
- b The regression used is the same as in panel 1, but considering the cumulative changes in each factor rather than their levels.

finances to the external balance adjustment would, according to these estimates, be around 20% (see panel 4 of Chart 3.4).⁸ The budget deficit in structural terms is still far from the targets set by the European Commission within the framework of the Stability and Growth Pact, which indicates that there is leeway for the positive contribution of this factor to continue to improve the current account balance.⁹

The gains in competitiveness posted by the Spanish economy also played a significant role. Spain's unit labour costs relative to the rest of the euro area decreased by 11% between 2008 and 2015. This improvement, together with that in financial conditions, proxied by the behaviour of long-term interest rates, would, in accordance with these estimates, explain around 9% of the cumulative adjustment in the current account between 2008 and 2015. Admittedly, the effect on the current account of lower financing costs may

⁸ The cyclical effect of changes in the structural component of the budget deficit upon inclusion of the output gap have been stripped out of this estimated contribution.

⁹ Note that the important factor for the current account is the structural fiscal balance relative to the other countries. Thus, on IMF data, in 2015 Spain's structural balance relative to the other countries improved despite worsening in absolute terms.

be ambiguous a priori due to its expansionary effect on final demand; yet according to the results obtained, this decrease contributed to the current account adjustment insofar as the effect of the improvements in the competitiveness of Spanish firms in the international markets has prevailed over its expansionary effect on the economy.

Population ageing and lower future growth expectations also played a part in the correction of the external deficit. Economic theory predicts that both population ageing and lower future growth expectations give rise to lower levels of investment and consumption which, in turn, would be reflected in less dynamic domestic demand. The dependency ratio, measured as the ratio of the population aged over 65 to the population aged between 16 and 65, has increased in Spain by 4.2 pp from 2008, and is expected to increase by 19.6 pp in the next 20 years, according to INE projections. Also, as described in Chapter 1 of this report, the potential growth of the Spanish economy has been revised downward to around 1.5%, from rates exceeding 3% before the crisis. These two factors explain a non-negligible percentage of the correction of the current account balance. Specifically, according to the results of the analysis (see panel 4 of Chart 3.4), the behaviour of these two factors would explain around 7% and 5% of the adjustment between 2008 and 2015, respectively.

4 Goods and services exports and imports

The aggregate evidence points to a better performance of exports than in the pre-crisis period which has not so far been accompanied by a change of similar proportions in the dynamism of imports. The behaviour of goods and services exports and imports as a percentage of GDP has differed in the last few years from that in the pre-crisis period. While exports have stood clearly above their pre-crisis levels, imports have been slightly below (see panel 1 of Chart 3.5). Once the cyclical component of trade transactions with the rest of the world has been stripped out, the results suggest the presence of an increase in the structural growth rate of exports since the sharp contraction of world trade in 2009.¹⁰ Meanwhile, although the change in the structural component of imports is of a smaller size, its growth rates are slightly below the pre-2009 levels, once the effect of domestic demand and import prices is removed (see panel 2 of Chart 3.5). The following sub-sections explore in more detail these two components of aggregate demand to identify the factors determining their behaviour.

4.1 GOODS AND SERVICES EXPORTS

Demand from external markets is the main determinant of Spanish exports, against a background in which their geographical diversification has increased considerably. Following the sharp contraction of world trade in 2009, the recovery of external demand has brought positive contributions to the growth of Spanish exports, which are, however, lower than in the pre-crisis period given the weakness of world trade (see panel 3 of Chart 3.5).¹¹ The positive performance of exports is due to a refocusing towards non-EU markets, and, in particular, towards the emerging economies, where demand was generally more buoyant during the past recession (see panel 1 of Chart 3.6).

The improved competitiveness of the Spanish economy also favoured the strong performance of exports, thus contributing to the gains in market share seen in recent years. Compared with the negative contributions of export prices in the pre-crisis years, the Spanish economy's recent gains in competitiveness have helped Spanish export

¹⁰ This structural growth is based on the estimation of an unobserved components model in which the cyclical component of exports depends on export prices and world demand, while that of imports depends on import prices and domestic demand. See, for example, R. Gordon (1997), «The Time-Varying NAIRU and its Implications for Economic Policy», *Journal of Economic Perspectives*, 11, pp. 11-32.

¹¹ For more details on the estimation of these contributions, see E. Prades and C. García (2015), «Actualización de la función de las exportaciones de bienes», *Boletín Económico*, April, Banco de España.

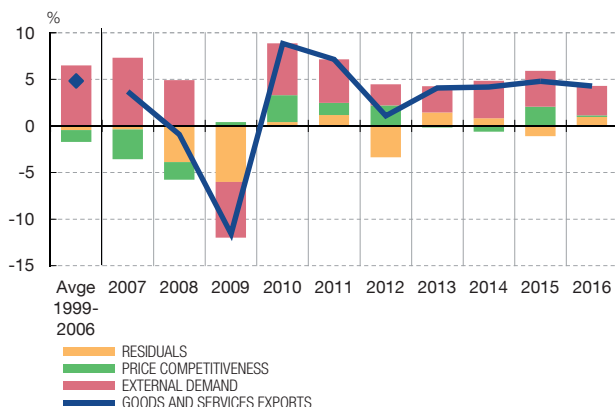
1 RATIO OF EXPORTS AND IMPORTS TO GDP (in real terms)



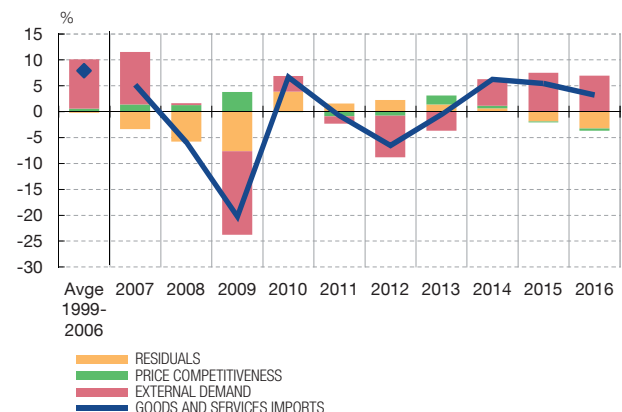
2 STRUCTURAL GROWTH OF GOODS AND SERVICES EXPORTS AND IMPORTS AS A PERCENTAGE OF GDP (a)



3 REAL GOODS AND SERVICES EXPORTS AND THEIR MAIN DETERMINANTS (b)



4 REAL GOODS AND SERVICES IMPORTS AND THEIR MAIN DETERMINANTS



SOURCE: INE and Banco de España.

- a Structural growth rates are obtained from the estimation of an unobservable components model in which a cyclical component is subtracted from observed growth. The cyclical component depends on export prices and world demand in the case of exports and on import prices and domestic demand in the case of imports.
- b For more details on the estimation of these contributions, see E. Prades and C. García (2015), "Actualización de la función de las exportaciones españolas de bienes", *Boletín Económico*, April, Banco de España.

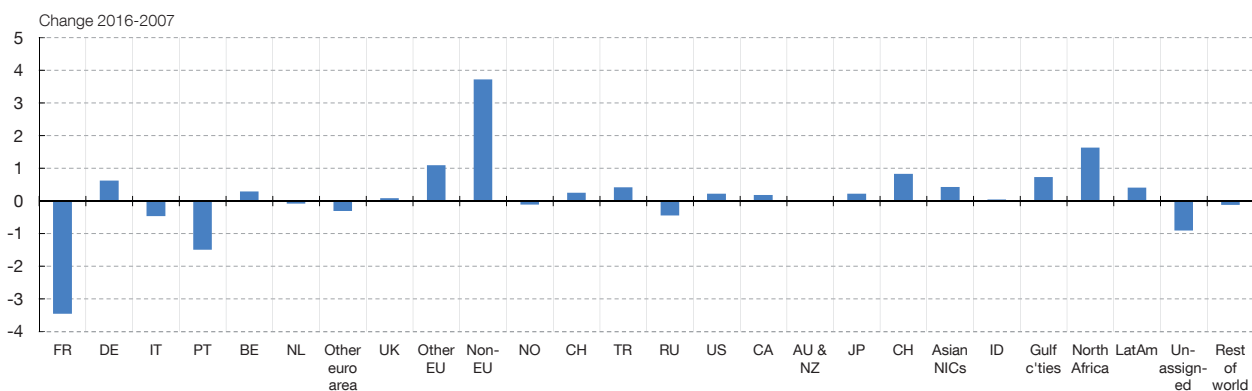
growth to outstrip world import growth, enabling widespread gains in international market share and greater geographical diversification towards markets with higher growth potential (see panel 2 of Chart 3.6).

The weak domestic demand seems to have prompted Spanish firms to focus more on exports. Domestic demand went from representing 76% of GDP in 2009 to 67% in 2015 (see panel 3 of Chart 3.6). This decrease coincides with a phase of strong growth of goods exports, up from 15% of GDP in real terms in 2009 to approximately 22% in 2015. Against a background of persistently weak domestic demand, the empirical evidence suggests that Spanish firms have been seeking new markets outside Spain.¹² Indeed, firm-level information from the International Transaction Reporting System in force until end-2013¹³ and from the Banco de España's Central Balance Sheet Data Office showed that the firms whose domestic sales fell most sharply were the ones whose goods and

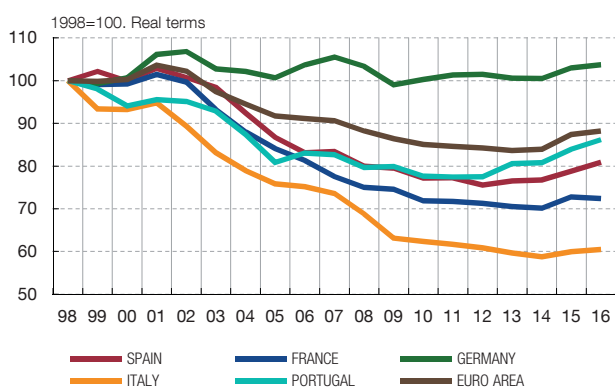
12 See, for example, P. Soares and E. Prades (2016), On domestic demand and export performance in the euro area countries: does export concentration matter? ECB Working Paper 1909.

13 For a description of this source, see Section 2.4.1 of the Banco de España publication "Balance of Payments and International Investment Position of Spain, 2013".

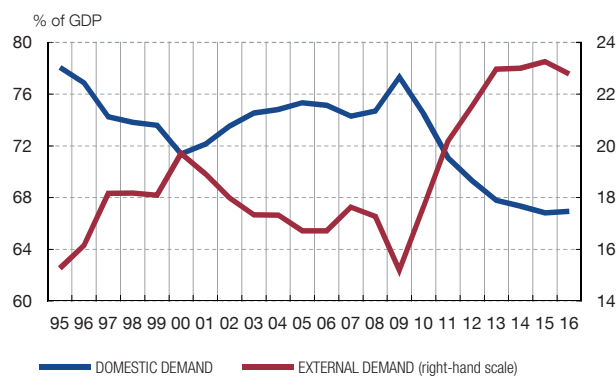
1 CHANGE IN THE DISTRIBUTION OF EXPORTS, BY COUNTRY



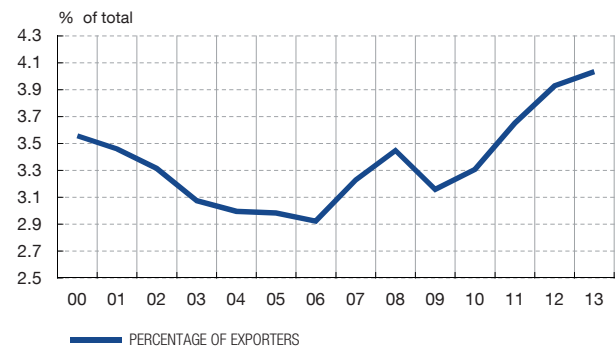
2 GOODS AND SERVICES EXPORT SHARES



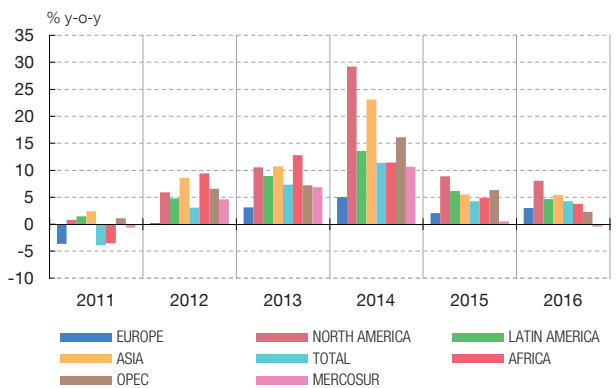
3 DOMESTIC DEMAND COMPARED WITH EXTERNAL DEMAND (a)



4 PERCENTAGE OF EXPORTING FIRMS



5 GROWTH OF NUMBER OF REGULAR EXPORTING FIRMS, BY DESTINATION (b)



SOURCES: Banco de España, Departamento de Aduanas e Impuestos Especiales de la Agencia Estatal de la Administración Tributaria, ICEX and INE.

- a External demand refers to goods exports.
- b A regular exporter is one that exports uninterruptedly for four years running.

Period 2004-2013	-0.025*** (0.001)
Period 2004-2007	-0.028*** (0.001)
Period 2009-2013	-0.037*** (0.002)

SOURCE: Banco de España.

- a The table sets out the coefficients of ordinary least squares estimates of a regression of the annual growth rate of firm-level exports on the growth of firms' domestic sales. Also included in the regression are fixed firm effects and fixed sector-year effects, along with the following control variables: firm size, import growth, inputs, productivity and debt ratio. The number of firms analysed is 1,077,862. Standard error in brackets with firm-level cluster. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.

services exports underwent the strongest relative growth. This association is apparent even in comparison of firms belonging to the same sector (and thus exposed to the same sectoral shocks) and having the same size, productivity, indebtedness and import dependency (see Table 3.1).

As a result of the aforementioned factors, there were significant long-term increases in the export base of the Spanish economy. The total percentage of exporting firms grew sharply from 2009 (see panel 4 of Chart 3.6), with small firms (fewer than 50 employees) being those which most stepped up their entry into foreign markets,¹⁴ although their contribution to total exports continues to be low.¹⁵ At the same time, the number of regular exporting firms has increased in the last four years by 31%, most notably in destinations with high potential growth such as Asia and the United States (see panel 5 of Chart 3.6). The fixed costs associated with the decision to export indicate that some of the broader exporting firm base is of a structural nature and, therefore, this development should prevail even in a scenario of persistent recovery in domestic demand.¹⁶

4.2 GOODS AND SERVICES IMPORTS

Domestic demand has been the main factor shaping imports in Spain, while the contribution of import prices has been limited. The fall in domestic demand triggered a sharp contraction of imports in the first stage of the crisis, while, in the recent recovery, its resurgence has not yet been sufficient to recoup the pre-2007 growth rates (see panel 4 of Chart 3.5). This lower contribution from domestic demand to import growth may reflect, at least partly, the behaviour of certain factors which, although weakening the dynamism of domestic demand, contribute to the correction of the external balance (fiscal adjustment, population ageing, lower growth expectations and others). Given the traditionally low price elasticity of imports, the process of internal devaluation played a more limited role in the aggregate behaviour of goods and services imports over the last few years.

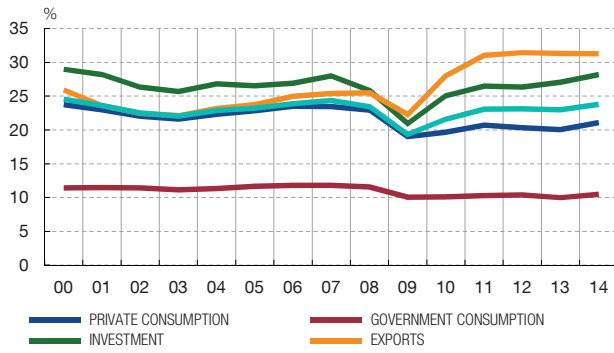
The strong performance of exports has also caused imports to increase to the extent that the former generally require the use of imported products. This is particularly clear in a setting of geographical fragmentation of production through the global value chains, which increase the international trade transactions per unit of product. The information

14 On balance of payments information, the percentage of exporting firms with fewer than 50 employees rose from 2.4% in 2009 to 3.4% in 2013.

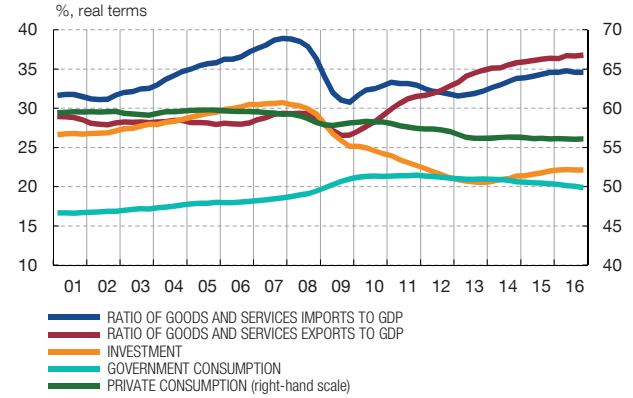
15 See M. J. González and C. Martín (2015), "The internationalisation of Spanish SMEs: main developments and their determinants", *Economic Bulletin*, December, Banco de España.

16 See, for example, R. Baldwin and P. Krugman (1989), "Persistent Trade Effects of Large Exchange Rate Shocks", *Quarterly Journal of Economics*, 104, pp. 635-654.

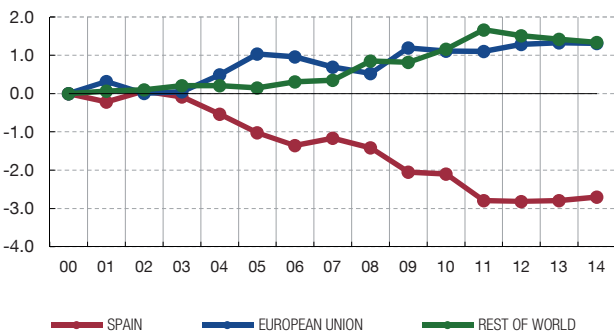
1 IMPORT CONTENT OF GDP COMPONENTS (a)



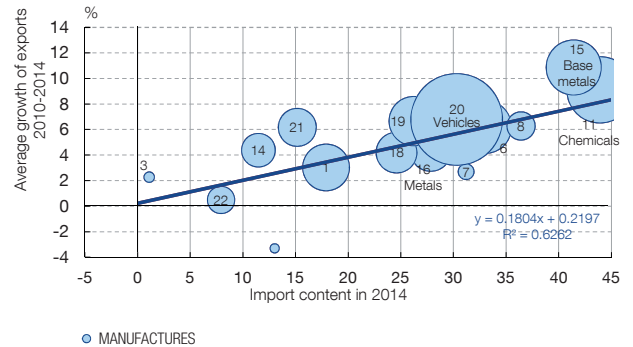
2 RATIO OF DEMAND COMPONENTS TO GDP



3 DISTRIBUTION OF INPUTS USED BY SPANISH FIRMS, BY GEOGRAPHICAL ORIGIN (b)



4 IMPORT CONTENT AND CHANGE IN EXPORTS, BY SECTOR (c)



SOURCES: QNA, INE, Departamento de Aduanas e Impuestos Especiales de la Agencia Estatal de la Administración Tributaria and WIOD 2016.

- a The import content is calculated according to Bussière et al.(2013), *Estimating trade elasticities: Demand composition and the trade collapse of 2008-2009*, using WIOD data. Import content is defined as the directly or indirectly imported portion (as percent) of each GDP demand component.
- b Change in weight of inputs by origin in the total with respect to that in 2000. The sample used is a panel of firms active in all years of the period 2000-2014.
- c Import content is calculated from the standpoint of GDP supply. Circle size represents the weight of each sector in total exports.



provided by the world input-output database (WIOD) allows us to quantify the high and growing import content of Spanish exports, which rose from 25% in 2008 to 31% in 2014 (see panel 1 of Chart 3.7).¹⁷

The higher export growth in the sectors with greater import dependency may be behind the widespread increase in the import content of exports in recent years.

According to the information in the world input-output tables, the recent gain in weight of the import content of exports is due more to increased exports in the sectors characterised by a higher import content than to an increase in imported products in each sector (see panel 4 of Chart 3.7). For example, sectors such as automobiles or chemicals have a high import dependency and, in turn, their exports have increased more.

17 For a description of how to calculate the import content of the GDP components using the input-output tables, see M. Bussière, G. Callegari, F. Ghironi, G. Sestieri and N. Yamano (2013), “Estimating trade elasticities: Demand composition and the trade collapse of 2008-2009”, 5, pp. 118-151.

The import content of other GDP components which lost weight during the crisis has decreased. The import intensity of private and public consumption has fallen since 2009, perhaps due to the decrease in household income and to the fiscal consolidation of public finances (see panel 1 of Chart 3.7). Specifically, the decrease in disposable income may have induced some households to replace the consumption of imported products and services, generally more expensive, with increased consumption of national goods and services.¹⁸ This phenomenon of substitution may have also contributed to reducing the import intensity of government consumption. Meanwhile, the weight of imports in investment recovered to pre-crisis levels following the fall in the period 2008-2010. All things considered, the information drawn from WIODs up to 2014 shows that the recovery of the pre-crisis levels of Spanish imports at the aggregate level conceals highly uneven behaviour by the various components of GDP.

The purchases abroad of Spanish firms suggest a certain replacement of imports by domestic production in the recent period. The firm-level information from the Banco de España's Central Balance Sheet Data Office allows the substitution of national goods made by Spanish firms for imports to be analysed. Specifically, following an ongoing decrease in the weight of national inputs, a change of trend is apparent from 2012 (see panel 3 of Chart 3.7). Once the effect of relative prices is stripped out, a fall in imports from the EU can be appreciated.¹⁹ Also, it is found that, upon an unexpected injection of liquidity into the firm, the increase in imported inputs exceeded that of national firms in the years prior to the crisis, while this response changed sign in the years following the crisis, when the increase in imported factors was smaller than that in national factors²⁰ (see Table 3.3).

However, the process of reallocation of resources to larger, more productive firms meant that firms with a higher import content gained market share, concealing the process of import substitution in aggregate terms. The aforementioned results suggest that Spanish firms may be shifting the composition of their inputs towards national goods. However, this process of substitution is not reflected in the overall aggregates because the firms with a greater import dependency gained market share (see Table 3.2).²¹ These firms tend to be larger, more productive and, above all, more export-oriented than the rest, which confirms the key role of exports as generators of imports (Box 3.2 characterises in more detail the features of Spanish importing firms).

5 Investment income and its determinants

The behaviour of the investment income balance of the Spanish economy played a major role in the observed adjustment in the current account. Compared with the trade balance analysed in the preceding section, the Spanish economy's investment income balance usually represents a lower percentage of the current account. However, this component played a major role in the adjustment seen in recent years, going from a deficit of 3.2% of GDP in 2008 to just 0.5% of GDP in 2015, against a background of sharp declines in interest rates (for more details, see Section 2).

¹⁸ See R. Bems and J. di Giovanni (2016), "Income-induced expenditure switching", *American Economic Review*, 106, pp. 3898-3931.

¹⁹ The number of firms in the sample which meet the time requirements is very small, so the conclusions must be regarded due caution. E. Prades and C. Villegas-Sánchez (2017), "Input trade and importers in Spain", Working Paper, Banco de España, forthcoming.

²⁰ The provision of liquidity considered is identified using information from the Banco de España's Central Balance Sheet Data Office on banks lending money to sample firms. For more details, see L. Alfaro, M. García-Santana and E. Moral-Benito (2017), "Credit supply shocks, network effects, and the real economy", Working Paper, Banco de España, forthcoming.

²¹ Note that this phenomenon is documented only until 2013 because no firm-level information on exports and imports after that year is available.

IMPORT CONTENT OF INTERMEDIATE CONSUMPTION USED BY SPANISH CORPORATIONS (a)

TABLE 3.2

	Import content	Average	Covariance
2003	0.11	0.03	0.08
2004	0.11	0.02	0.09
2005	0.03	0.03	0.00
2006	0.12	0.03	0.09
2007	0.09	0.04	0.04
2008	0.05	0.02	0.04
2009	0.00	0.01	-0.01
2010	0.11	0.02	0.10
2011	0.13	0.02	0.11
2012	0.14	0.02	0.12
2013	0.15	0.03	0.12
2003-2007	100.0	100.0	100.0
2008-2013	107.4	61.4	130.4

SOURCE: Banco de España (Central Balance Sheet Data Office and balance of payments).

a Import content is defined as the ratio of total imports in each year to the total inputs used by firms. This aggregate import content can be expressed as the sum of two terms: first, the simple average of the import content of all firms (average); and second, a covariance term which increases when firms with greater import content increase in size (covariance). For more details, see G. S. Olley and A. Pakes (1996), "The Dynamics of Productivity in the Telecommunications Equipment Industry", *Econometrica*, vol. 64, No. 646, pp. 1263-1298.

EFFECT OF AN INCREASE IN FIRMS' RESOURCES ON IMPORTS (a)

TABLE 3.3

Dependent variable	Import content growth (EU)	Import growth (EU)
Period 2004-2007	0.33*** (0.03)	0.09*** (0.01)
Period 2008-2013	-0.50*** -0.03	0.04*** (0.01)

SOURCE: Banco de España.

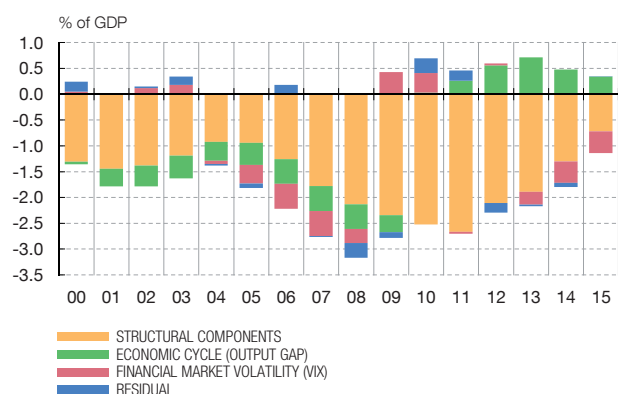
a The table sets out the coefficients of ordinary least squares estimates of import content growth on an increase in the exogenous liquidity of firms [for more details, see L. Alfaro, M. García-Santana and E. Moral-Benito (2017), "Credit supply shocks, network effects, and the real economy"]. Included in the regression are the following control variables: size, export growth, sales, productivity, debt and sector-year dummy variables. The number of firms analysed is 1,078,193. Standard error in brackets with firm-level cluster. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.

Both the economic cycle and the normalisation of financial conditions over the crisis period contributed significantly to the adjustment in the investment income balance in recent years.²² Generally the income balance tends to improve in recessions of the Spanish economy (see panel 1 of Chart 3.8). Thus in the years before the crisis, the positive output gap and the abundant financing under favourable conditions in the international financial markets contributed to a deterioration in the income balance. These same determinants explain a significant part of the correction accumulated since the onset of the crisis.

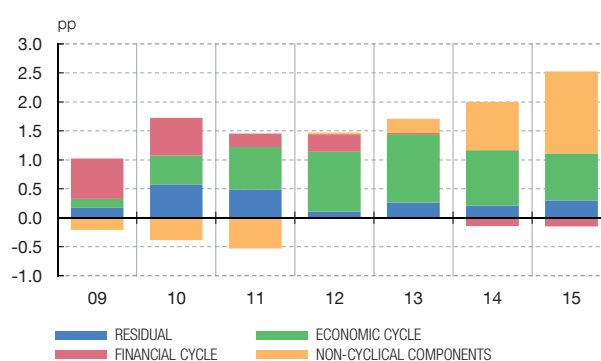
However, a significant part of the cumulative correction of the income balance is due to other potentially more structural factors, including most notably the increase in the weight of government debt holdings at the expense of private-sector liabilities held by non-

22 The analysis of this section is based on the same methodology used in Section 3 of this chapter, which consists of regression of investment income in Spain (as a percentage of GDP) on its fundamental determinants, which include both factors traditionally used in the literature and variables of particular importance for the Spanish case. E. Moral-Benito and F. Viani (2017), "An anatomy of the Spanish current account adjustment: the role of permanent and transitory factors", Working Paper, Banco de España, forthcoming.

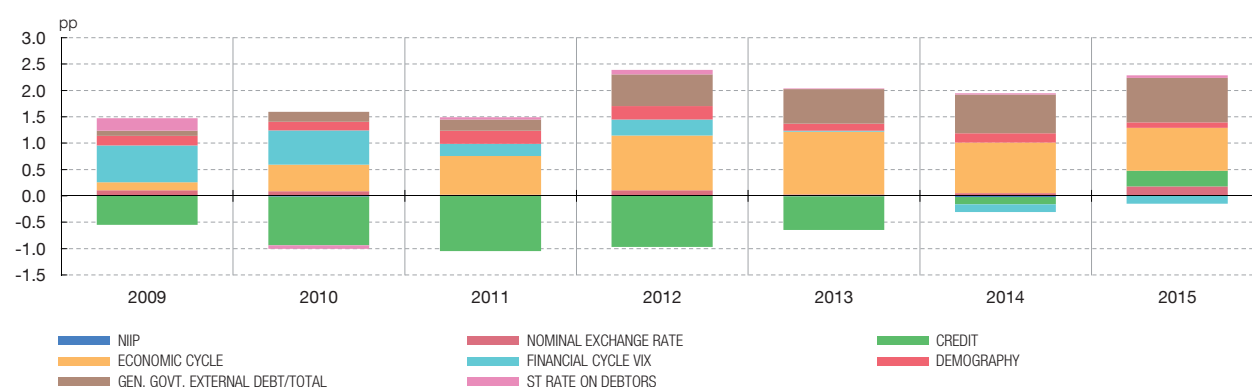
1 BREAKDOWN OF THE INVESTMENT INCOME BALANCE (a)



2 CUMULATIVE ADJUSTMENT IN THE INVESTMENT INCOME BALANCE (b)



3 BREAKDOWN OF THE ADJUSTMENT IN THE INVESTMENT INCOME BALANCE 2009-2015 (b)



SOURCE: E. Moral-Benito and F. Viani (2017), *An anatomy of the Spanish current account adjustment: the role of permanent and transitory factors*, Working Paper, Banco de España, forthcoming.

- a The breakdown is based on a regression of the investment income balance on a number of cyclical and non-cyclical factors. Specifically, cyclical factors include the output gap (economic cycle) and financial market volatility proxied by the VIX index (VIX financial cycle). Non-cyclical factors include the net international investment position (NIIP), the nominal exchange rate, private credit growth (credit), population ageing (demography), government external debt as a percentage of external debt (general govt. external debt/total) and the short-term interest rate on debtors.
- b The regression used is the same as in panel 1, but considering the cumulative changes in each factor rather than their levels.

residents. From 2014 other factors gained in importance and finally accounted for a considerable part (nearly 60%) of the total cumulative correction up to 2015 (see panel 2 of Chart 3.8). Notable among these factors were, firstly, the increase in the proportion of general government external debt, which tends to reduce the implicit return on fixed-income external liabilities (see panel 3 of Chart 3.8). Secondly, the gradual contraction of private credit was decisive in reducing Spain's stock of external debt, which, in turn, gave rise to a substantial improvement in the income balance. Finally, other factors with a more limited impact were the depreciation of the euro against the dollar, which boosted income from Spain's foreign-currency-denominated assets, and the decrease in short-term interest rates, which lessened fixed-income debt payments.

6 International investment position

Despite the correction of the external imbalance in recent years, the negative net international investment position (IIP) is still high. Although the current account surpluses since 2012 have generated net lending equal to 8% of GDP, the correction of the high external indebtedness built up in the previous expansionary phase²³ was somewhat

23 The enlargement of the negative net IIP in this period mainly reflected a deterioration of the portfolio investment balances, particularly in private-sector debt securities, followed by other investment. The contribution from direct investment net liabilities was small.

more modest, such that at end-2016 the negative net international investment position was still 85.7% of GDP, around 4.6 pp less than in 2012.

The degree of vulnerability represented by a given level of negative net IIP depends on a number of factors. The implications of a given level of external liabilities depend on their composition by instrument, sector, maturity and currency. Thus, given a certain level of external liabilities, the refinancing risks will increase with increasing proportion of claimable instruments, which, like fixed income, entail future payments of capital, interest or both. Also, it should be taken into account that a more negative external balance cannot always be extrapolated mechanically as higher vulnerability, since its course over time depends not only on the behaviour of the current account but also on so-called “valuation effects”, as explained below.²⁴ Finally, the degree of vulnerability may also depend on whether the external liabilities are high in net or gross terms.²⁵

The negative valuation effects derived from the normalisation of euro area financial conditions and the improvement in the outlook of the Spanish economy, prevented a sharp improvement in the net IIP. The negative valuation effects contributed significantly to the enlargement of the IIP in the past (around 36% of the total between 1999 and 2009) and also offset the improvement derived from the current account surpluses recorded from 2012 and a positive contribution of GDP growth during the current recovery (see panel 2 of Chart 3.9). These negative valuation effects, amounting to 10 pp of GDP throughout this latest period, do not, however, mean that external vulnerability deteriorated, because they are largely the result of normalisation of euro area financial conditions and the improved outlook of the Spanish economy, reflected in a revaluation of financial instruments issued by residents in Spain which exceeded that of foreign-issued instruments.²⁶

The composition of external liabilities may also attenuate the external vulnerability of the Spanish economy. In the case of Spain, the composition of external liabilities by instrument, sector, maturity and currency may mitigate to some extent the external vulnerability resulting from such a high level of external debt. First, it should be taken into account that the Banco de España has net external liabilities of nearly 15% of GDP, which in gross terms amount to 35% of GDP, and which are not subject to refinancing risk. Excluding these, the increase in external liabilities built up since 2012 (12 pp of GDP, to 210% of GDP) was mainly in the form of debt liabilities.²⁷ The increase in fixed-income external liabilities relates to government debt, while those of the private sector decreased,

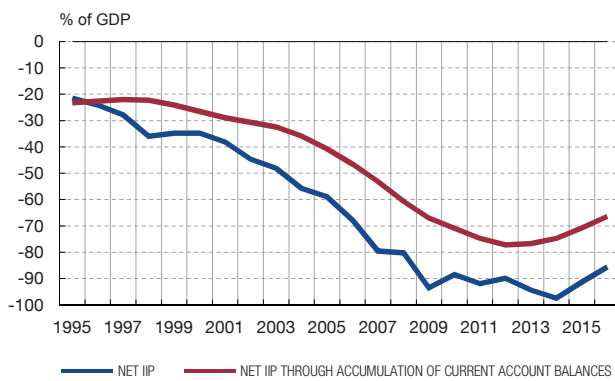
24 The change in the IIP between two points in time is determined not only by the nation's net borrowing or lending, but also by valuation effects, which reflect the changes in value undergone by the financial instruments composing the stock of financial assets and liabilities, resulting from variations in their price due to fluctuations in the exchange rate of the currency in which they are denominated. Disregarding possible valuation effects, the IIP as a percentage of GDP can be approximated by the following expression: $iip_t - iip_{t-1} \approx iip_{t-1} (i_t - g_t) + ca_t$, where i is the nominal interest rate, g is the nominal GDP growth rate and ca is the current account balance in terms of GDP.

25 Some authors argue that the relevant indicator is gross external liabilities [Shin (2012)], since it is a better indicator of the degree of financial integration with the rest of the world and refinancing needs are derived from them. However, L. A. V. Catão and G. M. Milesi-Ferretti (2014), “External liabilities and crises”, *Journal of International Economics*, 94, pp. 18-32, consider that net external liabilities are also a robust predictor of external tensions.

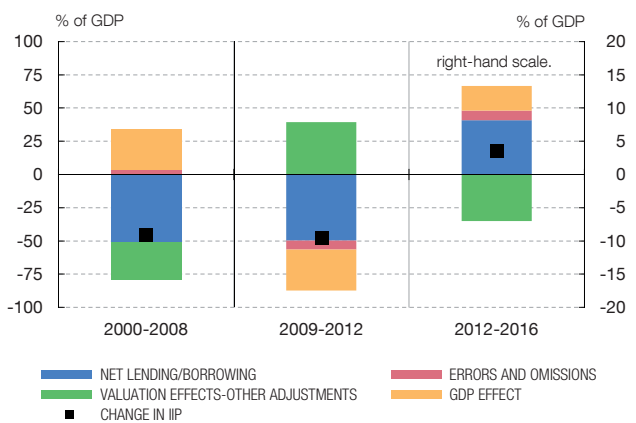
26 Thus, for example, once the tensions in the euro area sovereign market in mid-2012 had passed, the risk premia with respect to the euro area core countries decreased and, as a result, the price of Spanish government debt held by non-residents increased more sharply than that of foreign debt held by residents. Given that Spain has a net debtor position in instruments of this type, this price movement contributed to enlarging that debtor balance. Much the same occurred in the net position in shares and investment funds.

27 Non-debt liabilities, which do not necessarily carry payment obligations, consist of equity (as either direct investment or portfolio investment) and financial derivatives.

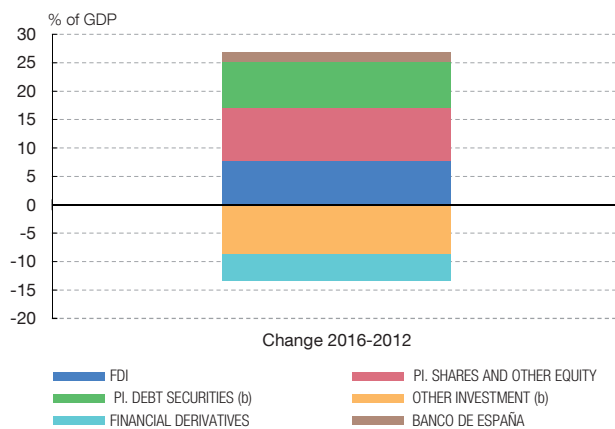
1 NET INTERNATIONAL INVESTMENT POSITION AND VALUATION EFFECTS



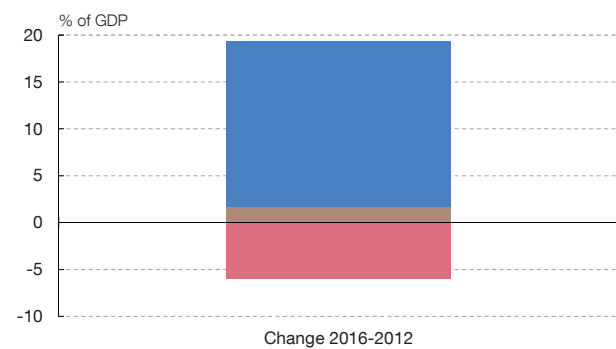
2 DETERMINANTS OF CHANGES IN THE NET INTERNATIONAL INVESTMENT POSITION



3 CHANGE IN EXTERNAL LIABILITIES BY FUNCTIONAL CATEGORY



4 CHANGE IN EXTERNAL LIABILITIES, BY SECTOR



SOURCE: Banco de España.

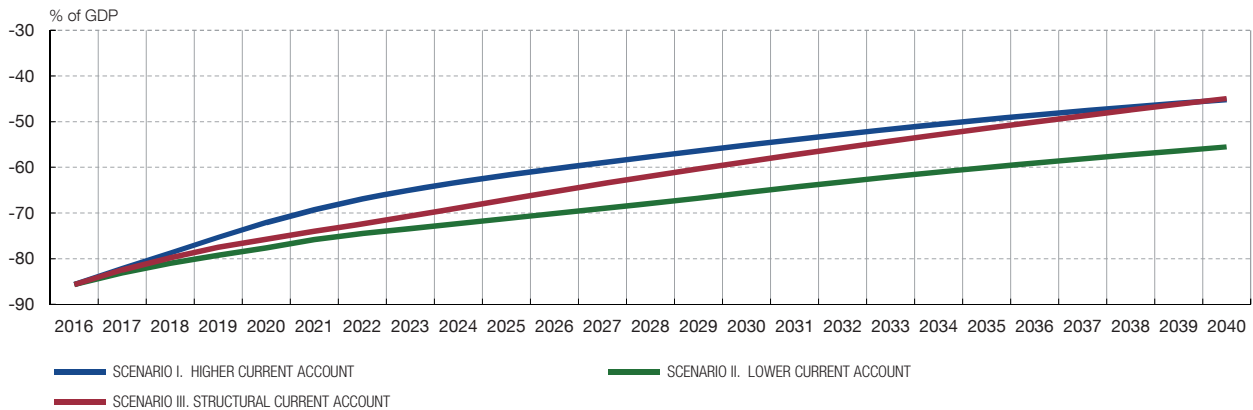
- a Valuation effects are gains/losses relating to the exchange rate and/or financial instrument prices, while other adjustments are other changes in volume, including most notably write-offs owing to recognition of the impossibility of recovering funds, asset and/or liability reclassifications, and changes in residence of holders or issuers of financial assets and liabilities.
- b Excluding Banco de España.



in line with the process of deleveraging of the resident sectors (see panels 3 and 4 of Chart 3.9). The increase in non-resident holdings of government debt from 2012 relate to the recovery of confidence of institutional investors in the Spanish economy. Additionally, the structure of liabilities by original maturity and currency contributes to moderating refinancing risk because the bulk of them are long term and denominated in euro (around 60% and 90% of the total, respectively).²⁸

In any event, the current level of external indebtedness represents a risk which must not be underestimated. The estimates of an early warning indicator of external tensions for a broad group of countries, including Spain, based mainly on the levels of liabilities to

²⁸ External assets (159 % of GDP, or, if the Banco de España is excluded, 139% of GDP) are another channel which may reduce external vulnerability in adverse situations, since residents can obtain one-off funds by reducing the balance of their investments abroad.



SOURCE: Banco de España.

a The scenarios in the chart depict IIP sensitivity to changes in the long-run current account balance. In the three cases the medium-term assumptions are the same for real GDP growth, the deflator and nominal interest rates (1.3%, 1.8% and 3.1%, respectively), but differ for the current account balance used in each of them. In no scenario are there valuation effects. Scenario I is compatible with a convergence to a long-run current account balance of 0.7% of GDP. Scenario II the implicit current account balance in the long run is -0.4% of GDP; and Scenario III considers a long-term current account balance equal to the estimated structural balance in 2015 (-0.2% of GDP).

the rest of the world, corroborate this element of vulnerability, as they also do in the case of other euro area countries (see Box 3.3).

Reducing the IIP to less vulnerable levels will require running current account surpluses over a long period of time. The behaviour of the IIP depends on the current and capital accounts, on nominal GDP growth and on interest rates. To illustrate the possible future course of Spanish IIP, we construct some paths of this variable based on assumptions about the aforementioned factors.²⁹ The results of an exercise of these characteristics show that, assuming that the current account balance gradually converges to the cyclically-adjusted level estimated for 2015 (-0.2% of GDP), the negative net IIP would stand at 70% for around the next five years (see Chart 3.10), and would reach 60% of GDP around 2030. These paths are sensitive to a deterioration in the long-term macroeconomic outlook. For example, if potential real GDP growth decreases by 0.3 pp with respect to the baseline scenario and interest rates are 50 basis points (bp) higher along the entire path, the convergence on those levels would be delayed for roughly another five years.

Achieving external surpluses on a sustained basis will require healthy public finances and sounder ongoing gains in the competitiveness of the economy. Reducing the degree of vulnerability derived from external indebtedness in a shorter time period would require an additional improvement in the current account balance. This would require both structurally sounder public finances and factor and product market reforms so that the gains in external competitiveness in recent years can be maintained and put on a firmer basis.

²⁹ Long-term real GDP and GDP deflator rates of 1.3% and 1.8%, respectively, are assumed for this year. The long-term nominal interest rate used in the simulation is 3.1%. The variables converge gradually from their current levels towards their long-term levels.

Since 2012 the non-energy trade balance has contributed positively to improving the trade balance, although this contribution has not been sufficient to offset the negative energy balance of Spain, which has thus continued to post a deficit (see Chart 1). In any event, the energy balance improved by 2.5 pp of GDP in this period to stand at -1.8% in 2016. The energy bill reflects the international market prices for goods of this type and the external energy dependence of the country. This second factor is determined by the relative importance of the various energy sources and the ability of firms and households to adopt technological improvements enabling them to use energy more efficiently. This ability will thus affect the improvement in the structural trade balance and the robustness of the economy to energy price movements.

Since it does not have significant sources of non-renewable primary energy, Spain has a high degree of energy dependence on the rest of the world and has to import most of its primary energy.¹ Chart 2 shows that currently around 75% of all primary energy used is imported, a figure which is very similar to that of 2000. However, this variable exhibits high cyclicity as a result of conjunctural changes in consumption and high supply rigidity. Thus, in the economic expansion before the last crisis, the degree of primary energy self-supply progressively declined and in 2007 national production only met 21% of resident agents' needs. Subsequently, the coverage of primary energy needs improved during the crisis to 29% in 2014 as a result of the lower economic activity, decreasing again in 2015 as activity recovered. Therefore, the coverage of primary needs largely reflects the observed behaviour in energy consumption (growth of 23% between 2007 and 1999, of -19% between 2014 and 2007 and a 4.6% in 2015). However, also contributing to the improvement in the degree of energy dependence on the rest of the world, although to a limited extent, was the production of primary energy, which increased by around 8% between 1999 and 2015 due to the increase in the stock of renewable energy generators.

As a means of separating the effect of the economic cycle from that of technological improvements and increases in local energy sources, we consider below two alternative measures of energy dependence for Spain and the euro area: first, energy intensity defined as the domestic consumption of energy per unit of GDP and, second, the ratio of net energy imports per unit of GDP (see Chart 3). No significant differences in energy intensity are appreciated between Spain and the euro area. However, Spain makes more purchases abroad than EU countries on average, due to its lesser endowment of primary energy sources, although this scarcity has been partially remedied in recent years. Focusing the analysis on Spain, it is seen that since 2005 the degree of energy intensity has trended downward. Sectorally, this improvement has been most marked in industry, followed by transport. A similar trend is apparent in the ratio of energy imports per unit of GDP,

1 Primary energy is defined as those energy sources in which the energy is obtained directly from the natural resource (oil, gas and solid, nuclear and renewable fuels).

although here the decrease has been less marked, indicating that a portion of the energy consumed ceased to be imported and was replaced by local energy. Thus, as noted above, the fall in the Spanish economy's energy dependence may have a certain structural component.

To understand what factors may be behind this improvement, we analyse below the composition of the energy sources. Chart 4 shows that oil is the main source of primary energy consumed in Spain (42% of the total), followed by natural gas (somewhat less than 20%) and renewable energies (14%). Both natural gas and the renewable energies currently have much higher shares than in 1999 (11% and 1.9%, respectively), since they have gained relative weight at the expense of other sources, except for nuclear power, which has remained at similar levels (around 12%). The highest loss in share was that of oil, which dropped from 53% into 1999 to 42% in 2015. This lower dependence on oil makes the Spanish economy less sensitive to oil price fluctuations on the international markets² and, consequently, the trade balance is less exposed to oil prices. This chart also shows how all this has resulted in a gain in the degree of primary energy diversification³ over these years.

The biggest demand for oil products comes from transport, a sector in which, for the time being, the use of other energies, although growing, is very low (see Chart 5). The use of gas increased in all sectors up to the crisis, but the slowdown in activity reduced its use, particularly in industry. At present, the consumption of this energy source exceeds that of 1999 in all sectors, except for industry and agriculture and fishing, its headway being most notable in the residential and services sectors. The expansion of the gas network, which has doubled since 2000, allowed a larger number of households to access this energy source, although it still has ample growth potential;⁴ and, additionally, the environmental advantages of gas over other fuels have favoured its increasing use in other activities, such as heating and air conditioning in commerce. Renewable energies have enjoyed subsidies which have helped their expansion, particularly in electricity generation (see Chart 6). Although electricity is not a primary energy, it does represent a significant and increasing percentage of the final energy consumed, so it is particularly important to consider which primary energy sources it uses as raw material. Specifically, in the electricity sector, in recent years renewable energies (particularly wind) have ousted combined cycles which use imported gas as the primary energy to produce electricity.⁵

2 Given that Spain's oil production is insignificant. For example, in 2015 the level of self-supply of oil was 0.42%.

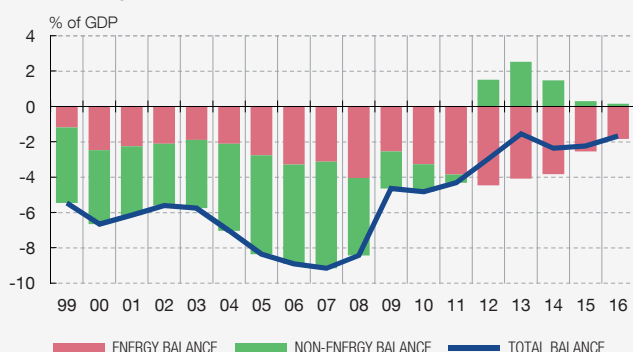
3 Measured as one minus the Herfindahl index, which is an index of the concentration of business activity which takes values between zero and one, higher values of the index denoting a higher concentration.

4 This is shown by the fact that in 2015, although 79% of the population lived in municipalities with natural gas supply, only 30% of houses were serviced [Annual Report, 2015, of the Asociación Española del Gas (Spanish Gas Association)].

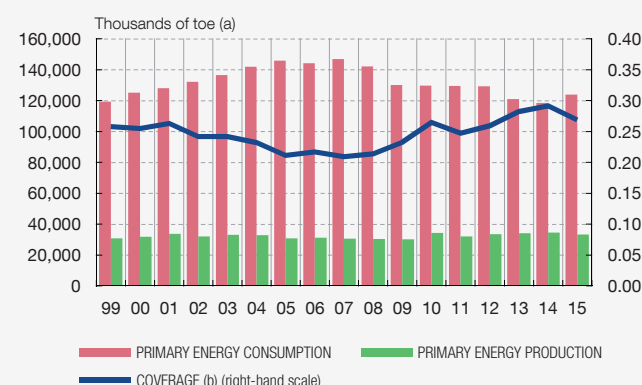
5 Currently combined cycle and coal-fired power stations are used as backup plants, i.e. they come into operation when there is little renewable generation due to scarcity of water, wind and sun.

SPAIN'S ENERGY DEPENDENCE

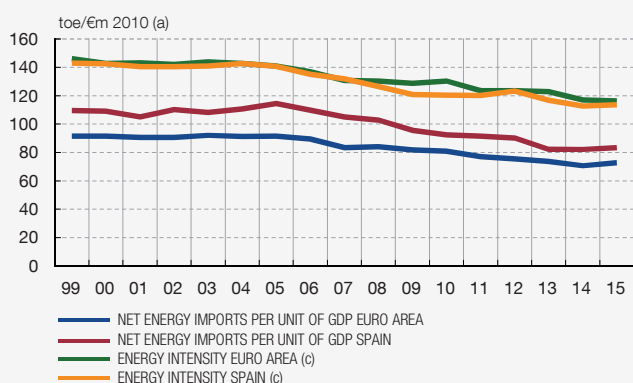
Panel 1
TRADE BALANCE



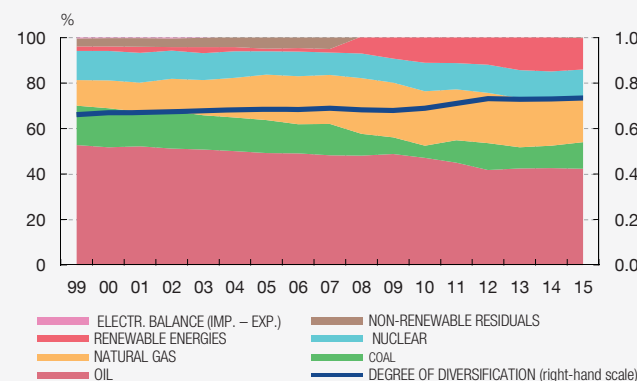
Panel 2
DEGREE OF PRIMARY ENERGY COVERAGE IN SPAIN



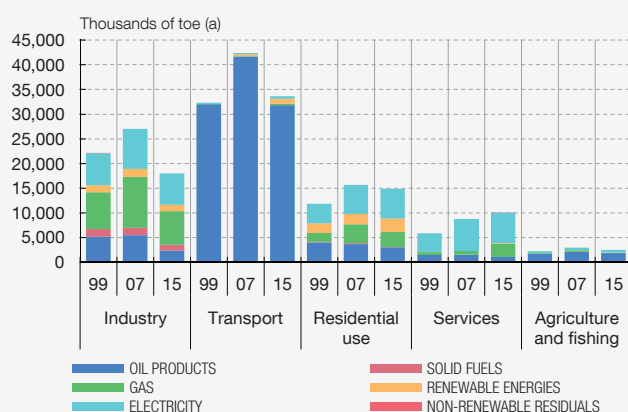
Panel 3
NET ENERGY IMPORTS PER UNIT OF GDP AND DEGREE OF ENERGY INTENSITY



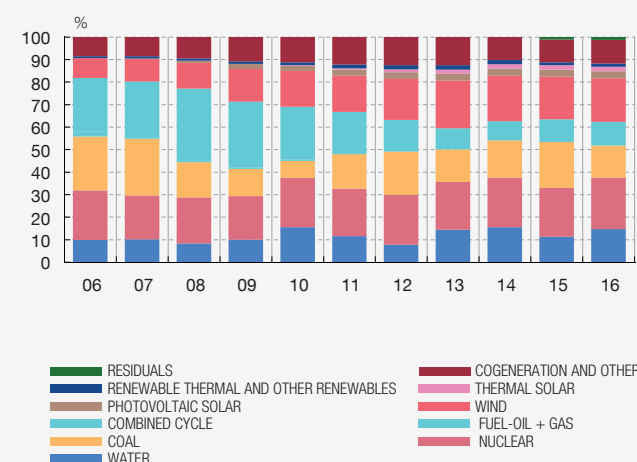
Panel 4
DEGREE OF PRIMARY ENERGY DIVERSIFICATION IN SPAIN



Panel 5
FINAL ENERGY CONSUMPTION

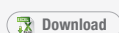


Panel 6
STRUCTURE OF MAINLAND ELECTRICITY GENERATION



SOURCES: Customs, Dirección General de Política Energética y Minas, Eurostat, INE, Red Eléctrica Española.

- a toe = tonne of oil equivalent.
- b Degree of coverage of primary energy = Primary energy production / Primary energy consumption.
- c Degree of energy intensity = Domestic consumption of energy / GDP.



To characterise the profile of Spanish importing firms,¹ this Box uses a database which combines firm-level information from various statistical sources and covers practically the total volume imported according to the National Accounts in the period 2000-2013. Specifically, information on the characteristics of non-financial corporations is taken from the Banco de España's Central Balance Sheet Data Office, which in turn draws on the financial statements submitted by those firms to the mercantile registers. The information on firms' cross-border transactions and the volume imported is taken from the Banco de España's international transaction reporting system.²

The weight of goods and services importers progressively decreased over the analysis period. Chart 1 illustrates how before the crisis the percentage of importing firms was substantially higher than the percentage of exporting firms. For example, in 2004 5.5% of Spanish firms were importers, while 3.5% were exporters.³ Note that, in the expansionary period before the crisis, the percentage of both exporters and importers decreased. This was due to the significant inflow of firms characterised by low productivity and non-internationalisation. However, in the years following the crisis there was an increase in the percentage of exporting firms and a decrease in the percentage of importers which left these two types of firm at a similar level slightly above 4% in 2013. However, an increase in the average value imported (see Chart 2) maintained the dynamism of aggregate imports until 2013.⁴

- 1 The term refers to direct importing firms, since firms can also import indirectly by acquiring imported products through distributors.
- 2 For a description of this source, see Section 2.4.1 of the Balance of Payments and International Investment Position, 2013, published by the Banco de España.
- 3 Note that this is percentage is calculated with respect to the total firms in the sample used, which differs slightly from the total firms according to the DIRCE (Central Companies Directory).
- 4 As in the case of exporters, it should be noted that total imports are highly concentrated in a small number of firms. Thus in 2013, 1% of the big importers accounted for around 55% of total imports, while 10% accounted for 70% of imports.

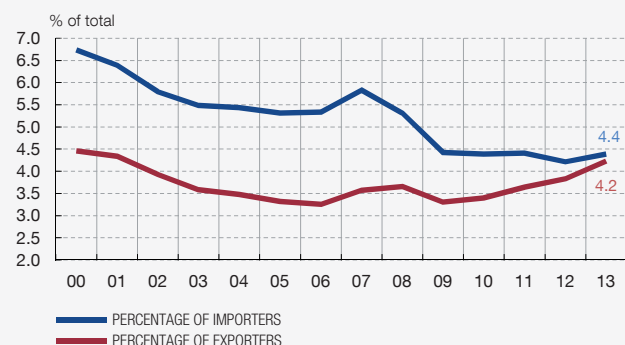
There is scant information on the characteristics of importers because the literature has traditionally focused on analysing and characterising exporters.⁵ However, the scant evidence available shows that importing firms have some characteristics similar to those of exporting firms when they are compared with non-internationalised firms. For example, Bernard *et al.* (2007) showed that importing firms are larger and more productive than non-importing firms in the United States, and Fernández *et al.* (2012)⁶ report similar results for euro area firms as a whole. In Spain, importing firms are also larger and more productive than non-importers (see Table 1). Also, jobs with them are of a less temporary nature and they are more highly capitalised. Specifically, throughout the period 2000-2013, importing firms were four times larger than non-importers in terms of number of employees and 10 times larger in terms of net turnover. However, these differences increase significantly in the years following the global financial crisis, when importing firms are on average seven times larger than non-importers in terms of employees. And the trend is very similar in net turnover, where the sales of importing firms, which on average were seven times higher during the expansion, became 16 times higher on average in the crisis years.

The above evidence is in line with the hypothesis discussed in Section 4.2 of this chapter, on the effects of firm-level composition, which may have masked the process of import substitution at aggregate level insofar as importing firms have grown more in

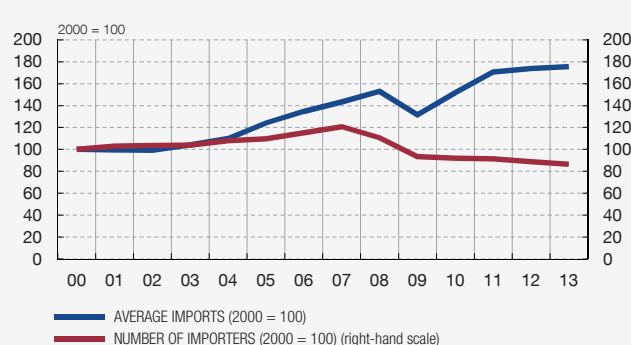
- 5 See A. B. Bernard, J. B. Jensen, S. J. Redding and P. K. Schott (2007), "Firms in International Trade", *Journal of Economic Perspectives*, vol. 21, No. 3, pp. 105-130; C. Martín-Machuca and A. Rodríguez Caloca (2009), "Una aproximación a las características de las empresas exportadoras españolas", *Boletín Económico*, May, Banco de España, and **Chapter 2 of the Annual Report, 2015, of the Banco de España**.
- 6 See C. Fernández, C. García, A. Rodríguez and P. Tello (2012), "Analysis of the import activity of European Firms", *Economic Bulletin*, October, Banco de España.

CHARACTERISTICS OF IMPORTING FIRMS IN SPAIN (a)

Panel 1
PERCENTAGE OF EXPORTERS/IMPORTERS OF GOODS AND/OR SERVICES



Panel 2
NUMBER OF IMPORTERS AND VOLUME IMPORTED



SOURCE: Banco de España, using SABI-CBI-BP information.

a Including only those firms with at least one transaction of more than €50,000. The total firms in this sample comprise those on which there is employment information.

relative terms. This effect is also observed in apparent labour productivity, although the productivity of importers was around 60% higher than that of non-importers during the expansion. This difference has increased to 100% in more recent years. Finally, the differences in temporary employment and capitalisation varied less over time, the temporary employment ratio of importers being 40% lower and their capitalisation being around 80% higher.

To quantify the relative importance of these factors and so explain the probability of a Spanish firm being an importer, we estimate below a linear probability model which takes into account the sector of activity in which the firm operates. Table 2 shows the results of the estimate, where each coefficient represents, within a given sector, how the probability of being an importer is affected by an isolated increase of 1 pp in each variable. For example, an increase of 1 pp in the number of

employees raises the probability of being an importer by 5 pp. The results show that the characteristics which significantly increase the likelihood that a firm will become an importer are, in decreasing order of probability, being an exporter, size (proxied by number of employees) and apparent labour productivity. Specifically, being an exporter increases the probability of a firm also being an importer by approximately 25 pp. Also, an increase of 1 pp in the number of employees or an increase of 1 pp in productivity are associated with increases of 5 pp and 3 pp, respectively, in the probability of being an importer. This probability decreases with temporary employment ratio and increases with ratio of capital per employee, although the magnitude of these effects is significantly lower than, for example, the size effect. Distinguishing between the pre-crisis and post-crisis sub-periods, no significant changes are seen in the effects of size, productivity and exporter status.

Table 1
CHARACTERISTICS OF SPANISH IMPORTING FIRMS

Median	Firm size (a)	Temporary nature of employment (b)	Ratio of physical capital per employee	Net turnover (d)	Labour productivity (e)
2000-2013					
Total firms					
Importing	11.0	19.9	16.6	7.8	39.1
Non-importing	2.6	33.3	8.9	5.5	23.6
Manufacturing					
Importing	24.9	16.7	25.1	8.2	39.3
Non-importing	4.5	25.0	11.5	5.8	25.1
Services					
Importing	7.0	20.5	12.6	7.5	39.0
Non-importing	2.8	30.0	9.8	5.6	22.8
2000-2007					
Total firms					
Importing	10.0	22.2	15.0	7.6	35.8
Non-importing	3.0	38.5	7.4	5.6	22.4
2008-2013					
Total firms					
Importing	15.0	13.3	23.1	8.3	49.9
Non-importing	2.2	26.7	10.6	5.5	24.9

SOURCE: Banco de España, based on Mercantil Register, Central Balance Sheet Data Office and balance of payments information.

a Firm size is based on the number of employees.

b Job temporariness is defined as non-permanent jobs expressed as a percentage of the total.

c Calculated as tangible fixed assets divided by number of employees.

d Net turnover, expressed as logarithm.

e Calculated as value added divided by number of employees.

Table 2
DETERMINANTS OF THE PROBABILITY OF IMPORTING

	All			Firms in the manufacturing sector	Firms in the services sector
	2000-2013	2000-2007	2008-2013	2000-2013	2000-2013
Size (a)	0.043*** (0.000)	0.051*** (0.000)	0.041*** (0.000)	0.086*** (0.001)	0.038*** (0.000)
Job temporariness (b)	-0.002*** (0.000)	-0.005*** (0.000)	-0.002*** (0.000)	-0.001** (0.000)	-0.001*** (0.000)
Fixed capital per worker (c)	0.008*** (0.000)	0.009*** (0.000)	0.006*** (0.000)	0.020*** (0.000)	0.004*** (0.000)
Productivity (d)	0.028*** (0.000)	0.036*** (0.001)	0.024*** (0.000)	0.046*** (0.001)	0.029*** (0.001)
Export dummy (e)	0.224*** (0.002)	0.255*** (0.003)	0.236*** (0.003)	0.210*** (0.004)	0.202*** (0.004)
Constant	-0.127*** (0.002)	-0.183*** (0.003)	-0.138*** (0.003)	-0.319*** (0.005)	-0.117*** (0.003)
Number of observations	1,254,098	613,950	640,148	301,156	661,803
Number of firms	376,654	244,689	257,932	85,113	208,273
Sector dummy variables	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes

SOURCES: CBA-CBB-BP and Banco de España.

NOTES: *, **, *** denote statistical significance at 10%, 5% and 1%, respectively.

This table sets out the coefficients of the estimates of a linear probability model, where the endogenous variable takes a value of 1 if the firm is an importer and 0 if it is not. Coke and refined petroleum products are excluded from the manufacturing sector in the firm sample. Financial and insurance services are excluded from the services sector. Exogenous variables are expressed as logarithm, except for export status. All regressions include a constant and sector and time dummy variables. The coefficients represent the influence of each variable on the probability of importing, i.e. the marginal effects evaluated at the average.

a Firm size is based on the number of employees.

b Job temporariness is defined as non-permanent jobs expressed as a percentage of the total.

c Calculated as tangible fixed assets divided by number of employees.

d Productivity is calculated as value added divided by number of employees.

e Export status is determined on the basis of the firm's exports of goods and/or services.

The level of external indebtedness of some euro area economies, including Spain, is a source of vulnerability, given that changes in the economic sentiment of the international financial markets could generate tensions in the refinancing of liabilities. In any event, external vulnerability depends not only on the level of an economy's external debt, but also on a wide range of factors such as an economy's cyclical position or financing conditions. Given their importance, the economic literature has attempted to construct so-called "early warning systems" to signal external tensions. These systems allow the identification of risk thresholds for external liabilities which, if exceeded, would indicate an appreciable increase in an economy's vulnerability to international market turmoil.

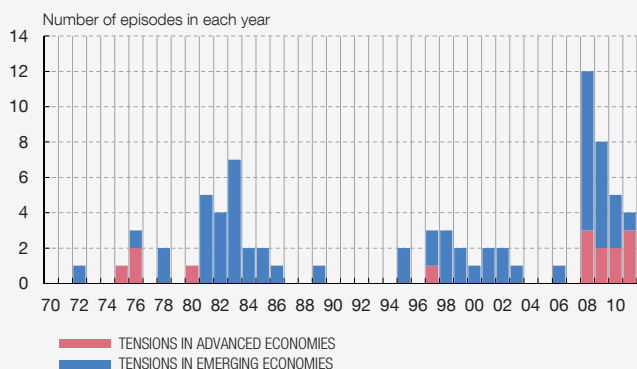
This box describes the construction of an indicator which broadly follows the methodology used by Hernández de Cos *et al.* 2014.¹ The early warning system is constructed in three main stages.

1 See P. Hernández de Cos, G. Koester, E. Moral-Benito and C. Nickel (2014), "Signalling fiscal stress in the euro area: a country-specific early warning system", Working Paper 1418, Banco de España.

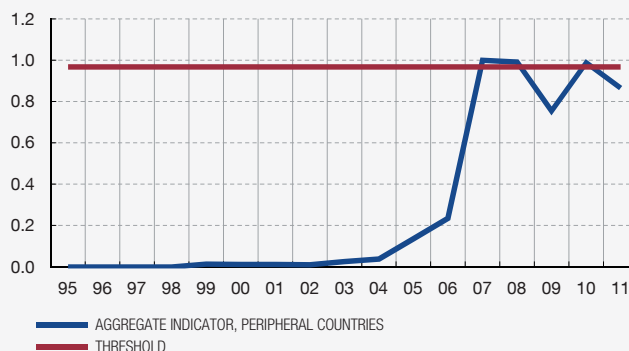
First, what is meant by an episode of external turmoil must be defined. The definition used comprises not only default on external debt or bailouts by international organisations, but also seeks to include other bouts of external turmoil associated with foreign exchange crises and a very sharp prior build-up of external imbalances, a mechanism which, for example, raised the external fragility of some euro area countries during the past expansionary phase.² With this definition 76 episodes of external tension were generated for the period 1970-2011 in 15 advanced economies (see accompanying charts). Then variables were selected which significantly affected the probability of occurrence of these

2 Specifically, the literature [see L. A. V. Catão and G. M. Milesi-Ferretti (2014), «External liabilities and crises», *Journal of International Economics*, 94, pp. 18-32] considers that there is an episode of external turmoil when at least one of the following conditions is met: i) debt rescheduling or external debt default, or recourse to IMF or European Commission bailout programmes; ii) real effective exchange rate depreciation of more than 20% in a single year, against a background of falling real GDP (proxy of exchange-rate crisis), and iii) cumulative current-account deficit in the preceding three years exceeding at least 25% of GDP, provided the negative net IIP in $t - 3$ exceeds 50% of GDP.

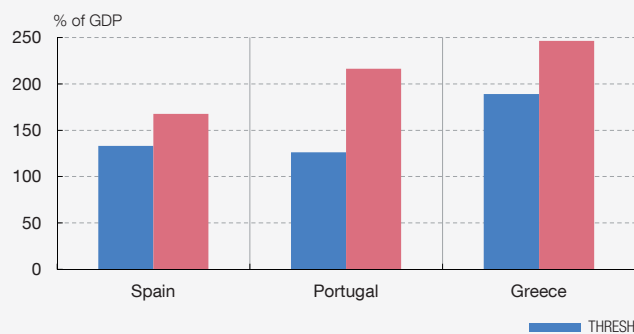
Panel 1
EPISODES OF EXTERNAL TENSION



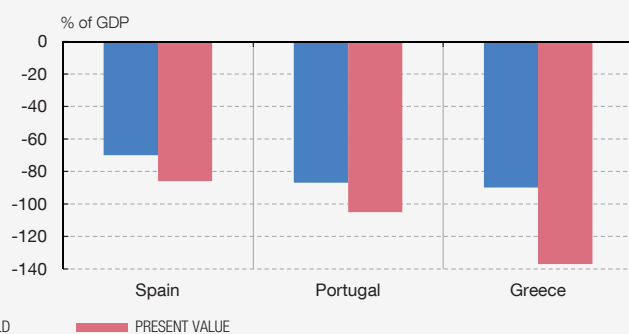
Panel 2
LEADING AGGREGATE INDICATOR OF RISK IN PERIPHERAL COUNTRIES



Panel 3
INTERNATIONAL COMPARISON OF GROSS EXTERNAL DEBT THRESHOLDS



Panel 4
INTERNATIONAL COMPARISON OF NET IIP THRESHOLDS



SOURCES: Lane and Milesi-Ferretti (2007), national sources and Banco de España.

episodes. Finally, an aggregate early warning indicator and so-called risk thresholds for each variable were estimated.

The possible determining factors of episodes of external turmoil are chosen through a regression analysis in which the explained variable takes the value of one in each episode of external turmoil and zero in other cases. The results indicate that the total external liabilities to the rest of the world, both in gross terms and, particularly, in net terms, is an advance indicator of the probability that external tensions will occur (see Table 1). The composition of this indebtedness is significant, because the probability of turmoil increases when it is in the form of debt liabilities, while debtor positions in foreign direct investment (FDI) would not raise external vulnerability. Another key factor raising the probability of external

turmoil is the size of the current account deficit, which generally gives rise to higher external indebtedness. Finally, the level of external liabilities being equal, more highly developed economies usually have fewer episodes of financial turmoil.³

In view of these results, the variables chosen to construct the early warning mechanism are the IIP, total external liabilities, net and gross external debt and the current account balance.⁴ Also constructed is an aggregate early warning indicator in which each

3 These results are robust to changes in the definition of an episode of turmoil.

4 These variables are available for the largest possible number of countries and have fewer quality problems than more disaggregated data.

Table 1
PROBIT ESTIMATES. PROBABILITY OF CRISIS (a)
(Variables expressed as a percentage of GDP, with a one-year lag.
Coefficients show average marginal impact)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net external assets	-0.09***	-0.04***	-0.06***					
	(0.01)	(0.01)	(0.02)					
Total external liabilities					0.01**		0.01**	
					(0.003)		(0.006)	
Net external debt				-0.07***				-0.06**
				(0.02)				(0.03)
Gross external debt						0.01*		
						(0.007)		
Net assets in foreign direct investment				0.09***				0.07**
				(0.03)				(0.04)
Liabilities in foreign direct investment						-0.09**		
						(0.04)		
Current account balance (two-year moving average)		-0.64***	-0.9***	-0.71***		-0.85***		-0.94***
		(0.11)	(0.17)	(0.11)		(0.12)		(0.17)
GDP per capita relative to the United States	-0.07***	-0.07***	-0.06**	-0.1***	-0.11***	-0.09***	-0.14***	-0.13***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)	(0.04)	(0.05)
Budget balance			-0.37*					0.3
			(0.21)					(0.26)
Deposit interest rates							0.03***	0.03***
							(0.01)	(0.01)
Number of observations	1,547	1,508	762	1,498	1,548	1,507	1,102	619
Wald chi2	130	148	73.7	142	98.2	131.3	98.3	80
Pseudo R2	0.19	0.24	0.34	0.26	0.13	0.24	0.18	0.35

SOURCE: Banco de España.

a The table shows the coefficients of the estimates of a normal probability model (Probit) in which the dependent variable is a dichotomic indicator of external tensions. The sample covers 15 advanced economies during the period 1970-2011. Standard error in brackets. *, **, *** denote statistical significance at 10%, 5% and 1%, respectively. Regressions include yearly dummies.

variable is weighted by its predictive power and which signals in advance the appearance of turmoil.⁵ The risk thresholds are specific to each country so as to maximise their predictive power [Hernández de Cos *et al.* (2014)].

Under this methodology, the aggregate early risk indicator for the euro area peripheral countries in the sample⁶ (weighted by the weight of each GDP) rose in the years immediately preceding the latest crisis as external imbalances built up in the euro area, and reached a peak coinciding with the turmoil in the euro area sovereign debt markets in 2010. Regarding the estimated thresholds, the current external indebtedness of these economies stands above these risk thresholds, although the gaps vary greatly in size, ranging from 20% to 40% of both net GDP and gross external debt. Thus, according to these estimates, the financially most vulnerable economies of the euro area, which include Spain

5 The criterion for building an early warning system is to minimise the forecasting error by assigning a higher relative weight to false negatives, since turmoil is an infrequent event.

6 Greece, Portugal and Spain.

because of its high external financial dependents, continue to exhibit significant vulnerability to a hypothetical deterioration in the international capital markets.

The foregoing results must be viewed with due caution, given the methodological difficulties in constructing these indicators. In particular, it should be taken into account that the thresholds are estimated using a small number of episodes of crisis, which reduces their robustness and their predictive power outside the sample used for estimating them. Also, this predictive power decreases as the signalling window becomes longer in time.

In any event, the convergence of the net IIP towards less vulnerable levels will require firmer and sustained external surpluses. These will be achieved more readily as progress is made in the adoption of structural reforms to improve the structural soundness of the public finances – made particularly urgent by population ageing – and boost the competitiveness of the Spanish economy by genuine gains in productivity, moderation of costs and reallocation of factors to the sectors and firms with highest growth potential.