

# ECONOMIC BULLETIN



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EUROSYSTEM



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# THE PORTUGUESE ECONOMY IN 2012 AND OUTLOOK FOR THE PORTUGUESE ECONOMY: 2012-2013



EXECUTIVE SUMMARY

THE PORTUGUESE ECONOMY IN 2012

OUTLOOK FOR THE PORTUGUESE ECONOMY: 2012-2013

SPECIAL ISSUES





## EXECUTIVE SUMMARY



2012 has been marked by the continuation of the Portuguese economy's adjustment process, in the context of the economic and financial assistance programme. This is the third episode of adjustment to serious macroeconomic imbalances in the Portuguese economy in the last four decades, leading to significant falls in GDP and employment, accentuated by the international economic and financial crisis. Albeit in a different macroeconomic regime, it should be remembered that past financing crisis episodes in the Portuguese economy also implied significant costs.

The Portuguese economy, in 2012, evolved in a context of restrictive monetary and financial conditions and maintained a contractionary fiscal policy stance. In this framework there was a deterioration of the Portuguese economy's cyclical position, characterised by a strong decline in GDP and significantly higher unemployment. In interconnection with the high costs associated with the deterioration of the cyclical position, progress was noted in the adjustment process, namely in terms of the rebalancing of the current and capital account balance, with growth of exports and a sharp reduction of imports. There were also signs of improvement in international investors' perceptions of the risk attached to the Portuguese economy. The consolidation of such progress and the capacity to sustain a balanced macroeconomic situation require a structural base, grounded on a trend increase in productivity. However, the continuously worsening cyclical position of the economy may have a negative impact on potential growth. This risk may be exemplified by a continuous reduction of the level of the capital stock, a depreciation of the human capital of unemployed workers and an emigration of qualified young people.

The correction of the imbalances accumulated from the past, on top of a structural restructuring process taking place over a longer timeframe, related with the integration of the Portuguese economy in a global context, is occurring in a framework of major uncertainty. In fact, the difficulties and risks deriving from the adjustment process have been worsened by the prevalence of a high level of uncertainty over the evolution of the international economy and the resolution of the sovereign debt crisis in the euro area.

During the course of 2012, the European authorities embarked upon the task of reducing the level of uncertainty and promoting the recovery of economic activity. The resurgence of tensions in the second quarter of 2012, particularly the close relationship between sovereign risk and the banks in the euro area, evidenced the need to adopt additional measures to restore investor confidence. In such a context, reference should be made to European Council resolutions to create a Banking Union and the ECB's declaration of its willingness, within its mandate, to take the necessary steps to preserve the euro. Such developments were accompanied by the announcement of a new sovereign bonds transactions programme in secondary markets. An expansionary monetary policy stance was also maintained in the euro area.

The set of institutional reforms in the European Union and the monetary policy stance are important factors for the success of the Portuguese economy's adjustment process, insofar as they contribute towards a lower level of fragmentation of credit markets in the European area (see "Special issue 2 *Transmission of monetary policy in the euro area*"). The progressive regularisation of the Portuguese economy's financing conditions, particularly in the private sector will, over time, contribute to the recovery of productive investment and potential economic growth, with a favourable effect on public debt ratio dynamics and the international investment position.

The monetary and financial conditions of the Portuguese economy remained restrictive in 2012, in a framework of disturbances in the transmission of monetary policy in the euro area and the economy's structural adjustment. The supply of credit remains conditioned by the banks' high level of risk aversion, in a context of high uncertainty, high indebtedness and deterioration of the financial situation of corporations and households. In addition, banks' borrowing costs remained high, although interest

rates on deposits, benefiting from the impact of the ECB's non-conventional monetary policy measures, have started to come down. Therefore the banks' liquidity situation improved substantially. There are signs that the more restrictive lending criteria started to ease during the course of 2012, albeit with a high level of heterogeneity between corporations. Whereas major corporations and export companies maintained access to domestic credit or secured alternative funding sources at a lower than average cost, small and medium-sized enterprises continued to encounter financing difficulties.

The banking system continued to deleverage during the course of 2012. Banks' balance sheet adjustments were based on a strong increase in their own funds, which is a highly important factor to increase their resilience to negative shocks, something particularly relevant in the context of the adjustment of economic imbalances. There was also an increase in borrowing from the Eurosystem, which was dominated by the behaviour of foreign banks operating in Portugal. Households' deposits, although continuing to grow significantly, slowed during the course of the year, which was, to a large extent, expected given the strong previous adjustment based on portfolio adjustments. This was accompanied by a highly significant reduction of banks' indebtedness in the international markets, with a high volume of maturities and own bonds repurchases accompanied by a continuous drop of financing by non-resident credit institutions. On the assets side the deleveraging process was based on a reduction of credit for non-residents, with a sharper reduction of credit to the resident private sector as opposed to an important increase in financing for the public sector. In turn, the deleveraging of the business sector is still quite moderate in aggregate terms and is likely to proceed over the long term, particularly benefiting from the upturn of economic activity. In this context, higher corporate capitalisation and demand for alternative financing sources are essential.

The Portuguese fiscal policy stance continued to be contractionary and pro-cyclical in 2012 and is likely to remain so over the coming year. Compliance with the objectives of reducing the fiscal deficit is a *sine qua non* for ensuring the regular financing of the Portuguese economy and curbing public debt ratio growth dynamics. The composition of the fiscal adjustment process is an important issue. The option of increasing revenues as a means of achieving fiscal goals reduces the volume of available resources in the private sector, with adverse consequences on investment decisions and future economic growth. Tax hikes also have a negative impact owing to their market distortion effects, increasing inefficiencies in the use of productive resources. The fiscal consolidation strategy should, *inter alia*, include a reduction of public expenditure. This reduction implies the improvement of management in areas in which the use of public resources is inefficient – thus limiting transversal interventions, to avoid putting at risk the functioning of areas considered fundamental – in addition to the identification of areas with a relatively lower social return. In such an environment, a sustainable fiscal consolidation strategy should be based on options regarding the State's fundamental intervention areas in a context of institutional cooperation and social dialogue (see "Special issue 1 *The importance of institutional cooperation and social capital in economic adjustment processes*").

The sharp contraction of domestic demand in 2012 and 2013 will only be partially offset by the positive evolution of exports, implying a deterioration of the Portuguese economy's cyclical position. In accordance with the current projections, economic activity is likely to contract once again in 2013 (1.6 per cent), albeit less significantly than in the projection for 2012 (3 per cent). The restrictive fiscal policy stance, in conjunction with unfavourable expectations regarding the evolution of activity and the labour market, the perception of a reduction in permanent income and savings being made for precautionary reasons explained a sharp reduction of household consumption, both on durable consumer goods as well as current consumption. In addition, expectations of a reduction of domestic demand, high levels of uncertainty and restrictiveness surrounding monetary and financial conditions contributed towards the maintenance of a negative performance of investment, which will continue through 2013. Among companies which refer to limitations on investment, the deterioration of expectations regarding demand continues to be unequivocally singled out as the main limiting factor, although there was a slight increase

in the percentage of those making reference to important limitations on obtaining bank credit. In a scenario where high corporate indebtedness prevails, financing restrictions may turn out to be a limiting factor on the recovery of activity, curbing the recovery of productive investment, particularly if they disproportionately affect new companies and innovative projects. On the contrary, exports of goods and services should continue to record marked growth in 2012 and 2013. Exports have evolved in a highly uncertain context with deteriorating levels of economic activity in Portugal's main trading partners, being worth highlighting the existence of strong gains in market share. The reduction of imports, in turn, reflects the evolution of global demand. In this context, there is a substantial improvement in the current and capital account balance, translating into a surplus in 2013. In short, this scenario points to a continuation of the Portuguese economy's adjustment process in 2012 and 2013, with a deterioration of the cyclical position and labour market situation, being accompanied by the continuation of export dynamics and a significant reduction of external borrowing requirements.

Changes in the composition of global demand have implied heterogeneity in the evolution of activity and employment in the various productive sectors. The beginning of the sectoral restructuring process preceded the economic and financial crisis, being derived from the economy's response to changes to the pattern of comparative advantages and associated with creative destruction processes. In turn, the recent adjustment of the Portuguese economy accelerated the reduction of resources allocated to non-tradables sectors. In such a context, the effective implementation of the agenda for structural reform included in the economic and financial adjustment programme is important for reducing the costs of the sectoral reallocation of productive resources. In particular, the improvement of operating conditions in the labour market should be targeted at the reduction of segmentation, the creation of new jobs and the subsequent containment of the unemployment rate, which reached 15 per cent in the first half of 2012.

The deterioration of the Portuguese economy's cyclical position is also evident in the underuse of productive factors, bringing downwards pressure on the prices of goods and labour costs. The average rate of change of the HICP decelerated in 2012, notwithstanding the increase of indirect taxes, and it will be further accentuated in 2013. In turn, unit labour costs are likely to fall once again in 2012, as a result of higher productivity and a significant decline in remuneration, to which the general government sector contributed. A relative stabilisation of unit labour costs is expected in 2013. In relative terms, the decline in unit labour costs over the last few years has implied a correction of the moderate real appreciation accumulated since the beginning of the euro area. This is one of the recovery channels for the external competitiveness of the Portuguese economy over the short term, which complements gains in competitiveness based on the continuation of the restructuring process of productive activity.

The management of the dynamics of the Portuguese economy's adjustment process is extremely important and involves various policy challenges. A potential moderation of the intensity of the adjustment effort, namely in fiscal terms, is conditioned by the financing requirements of the Portuguese economy and implies a higher level of debt accumulation, thereby worsening sustainability conditions. In such conditions, a fiscal adjustment that contributes to increase potential growth of the economy cannot be delayed. The existence of social consensus regarding adjustment process guidelines is a *sine qua non* for maintaining credibility in the international financial markets and in the eyes of international authorities and consequently for the success of the adjustment programme (see "Special issue 1 *The importance of institutional cooperation and social capital in economic adjustment processes*"). The promotion of economic growth, based on export dynamics, spearheaded by the private sector and benefiting from the public sector's catalysing role may be an important aggregating factor.

The Portuguese economy's adjustment process will continue to take place in a context of domestic stability under the framework of European institutional mechanisms, which are also undergoing a reform process. This process is likely to lead to a scenario different from the one existing prior to the onset of the international economic and financial crisis, sustained by the better functioning of markets



and the judicial system, aligning agents' incentives in an institutional framework that reinforces human, physical and social capital. In this new regime, the improvement of household consumption levels, general government services and investment dynamics must be the result of structural productivity gains, anchored by an increase in the economy's degree of openness.

## 1. International environment

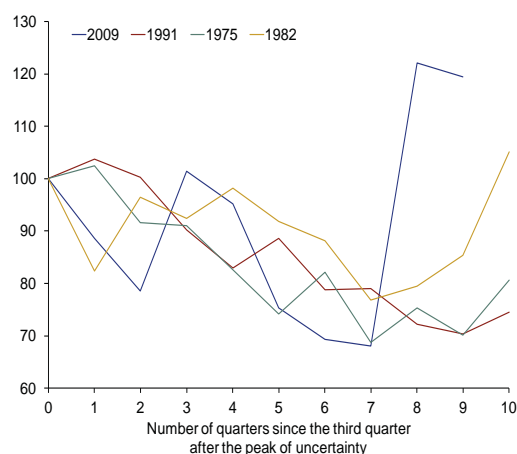
The external environment of the Portuguese economy in 2012 continued to be marked by a high level of uncertainty reflected in the persistent financial market volatility, in the erosion of economic agents' confidence and, as a result, in the postponement of the global economic recovery. The high level of uncertainty had an heterogeneous impact across countries, and was particularly adverse in countries undergoing adjustment processes of domestic and external macroeconomic imbalances, such as the Portuguese economy.

The prevailing level of uncertainty in the international economy tends to result in part from the phase of the business cycle. In general, the level of uncertainty declines during expansions and increases during recessions.<sup>1</sup> During the current economic recovery, however, there seems to have been no gradual decline in uncertainty (Chart 1.1). An explanation for this may be partly related to the uncertainty underlying economic policy measures adopted or to be adopted in some advanced economies, visible in the rise in the uncertainty indexes for the euro area and the United States (Chart 1.2).

In the euro area, in particular, doubts remain regarding the willingness of national authorities to implement the policies needed to solve the sovereign debt crisis and the ability of some countries to meet fiscal targets against a background of weak economic growth. In the United States, the main source of uncertainty is related to doubts about the future fiscal policy stance, taking into account the discontinuance of a number of measures stimulating the economy in late 2012, and the automatic expenditure cuts set out for early 2013. The potential lack of a credible response by the European and US authorities in this regard will contribute to keep uncertainty high and to a downward revision of economic growth prospects, even in the short term. The adjustment process of the Portuguese economy would thus become even more complex.

**Chart 1.1**

### LEVEL OF UNCERTAINTY IN THE UNITED STATES DURING GLOBAL ECONOMIC RECOVERIES

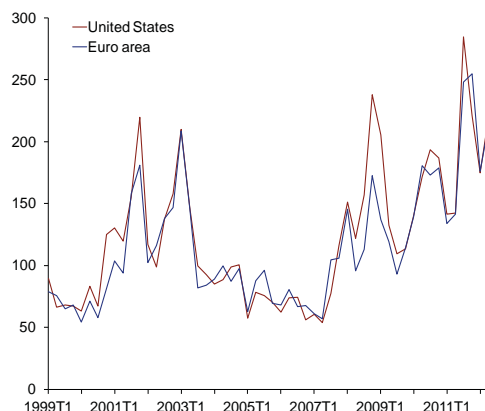


**Source:** IMF, World Economic Outlook, October 2012.

**Notes:** Each line represents the evolution of uncertainty in the United States, measured by the monthly standard deviation of daily stock returns, three quarters after the peak during the respective global recession. Recession episodes are identified following Kose, Loungani and Terrones (2009), "Out of the Ballpark," Finance & Development, Vol.46.

**Chart 1.2**

### ECONOMIC POLICY UNCERTAINTY INDEX



**Source:** Economic Policy Uncertainty, September 2012.

**Notes:** These indexes are calculated by Baker, Bloom and Davis (2012), "Measuring economic policy uncertainty", based on the frequency with which the terms "economic policy" and "uncertainty" appear together in the media. Data available at [www.policyuncertainty.com](http://www.policyuncertainty.com).

<sup>1</sup> Some theoretical arguments and empirical results point to a negative impact of uncertainty on economic activity. In addition, some empirical evidence suggests that the decline in economic activity leads to higher uncertainty. Taken together, these effects imply that longer recessions and slower recoveries are associated with higher uncertainty. For a more detailed analysis see "Box 1.3 How Does Uncertainty Affect Economic Performance?", World Economic Outlook, October 2012 and the references therein.

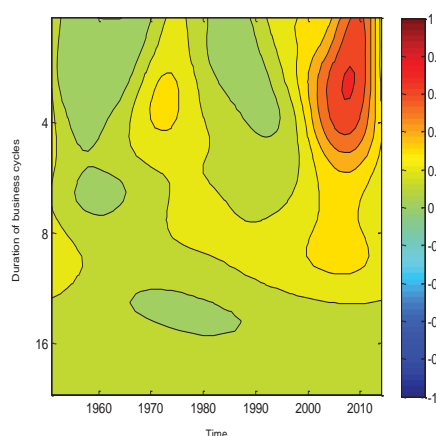
***Five years after the start of the financial crisis, the global economic recovery remains rather slow and irregular***

World economic activity slowed down further in 2012, reflecting, however, rather different growth paces across the various regions. This heterogeneity during the economic recovery is in contrast with the highly synchronised recession after the start of the financial crisis (Chart 1.3). According to the International Monetary Fund (IMF) forecasts released in October, Gross Domestic Product (GDP) growth continued to be weak in advanced economies, standing at 1.3 per cent in 2012, i.e. 0.3 percentage points (p.p.) less than in 2011 (Table 1.1). Against a background of lower demand by the advanced economies, emerging market and developing economies also lost momentum. Nonetheless, the IMF's forecasts point to fairly robust growth in the year as a whole (5.3 per cent in 2012, compared to 6.2 per cent in 2011). The deceleration in economic activity is likely to be particularly marked in central and eastern European countries, which are more exposed to euro area developments due to trade and financial links, but also in China and Brazil, which are largely responsible for the slowdown in economic activity in their respective regions.

The slowdown in world economic activity and the high level of uncertainty translated into a significant deceleration of trade flows in 2012. The IMF estimates that the volume of trade in goods and services will grow by 3.2 per cent in the year as a whole, compared with 5.8 per cent in 2011. In particular, the pace of growth of advanced economies imports is expected to decline substantially from 4.4 per cent in 2011 to 1.7 per cent in 2012. Forecasts also point to a loss of momentum of imports of emerging market economies, which are expected to grow by 7 per cent in 2012 (8.8 per cent in 2011).

**Chart 1.3**

**WORLDWIDE COHESION**



**Source:** Rua (2012), "Wavelets in Economics", Banco de Portugal, *Economic Bulletin – Summer*.

**Note:** The measure of cohesion allows to assess the degree of synchronization across countries and varies between -1 and 1 (where a high (low) value corresponds to a high (low) degree of synchronization). The measure displayed in the chart refers to the worldwide cohesion of the annual growth of real GDP for 40 countries, covering around 87 per cent of world GDP.

**Table 1.1**

GDP   REAL PERCENTAGE CHANGE				
	2009	2010	2011	2012
<b>World economy</b>	-0.6	5.1	3.8	3.3
<b>Advanced economies</b>	-3.5	3.0	1.6	1.3
United States	-3.1	2.4	1.8	2.2
Japan	-5.5	4.5	-0.8	2.2
Euro area	-4.4	2.0	1.4	-0.4
Germany	-5.1	4.0	3.1	0.9
France	-3.1	1.7	1.7	0.1
Italy	-5.5	1.8	0.4	-2.3
Spain	-3.7	-0.3	0.4	-1.5
Netherlands	-3.7	1.6	1.1	-0.5
United Kingdom	-4.0	1.8	0.8	-0.4
<b>Emerging market and developing economies</b>	2.7	7.4	6.2	5.3
of which:				
Poland	1.6	3.9	4.3	2.4
China	9.2	10.4	9.2	7.8
Brazil	-0.3	7.5	2.7	1.5
Angola	2.4	3.4	3.9	6.8

**Source:** IMF, World Economic Outlook, October 2012.

***Developments in economic activity and world trade have translated into significant deceleration in external demand for Portuguese goods and services***

Economic activity in the euro area and the United Kingdom, which represented almost 70 per cent of Portuguese exports in 2011, deteriorated markedly in 2012. The IMF estimates a GDP contraction of 0.4 per cent in both economies in the year as a whole, compared with 1.4 and 0.8 per cent growth in 2011, respectively. These developments took place among unfavourable financial conditions, the ongoing fiscal consolidation process in a number of European countries, and the sharp deterioration in economic sentiment. More recently, the weakness in economic activity in euro area countries experiencing tensions in the sovereign debt markets (hereafter referred to as countries under stress),<sup>2</sup> in tandem with the persistently high level of uncertainty, may have passed through to the other euro area economies, namely through the decrease in household and business confidence. According to the European Commission's confidence surveys, the unfavourable developments observed in the euro area as a whole in the third quarter were largely determined by the abrupt deterioration in confidence in Germany, France, Austria and Finland. This deterioration has been especially marked in consumers and in the services sector surveys, with economic activity being expected to decelerate further in the second half of the year. In the countries under stress, confidence has also declined, but less markedly, due to the low levels already reached by those indicators.

The deceleration in economic activity expected for 2012 is broadly based across euro area countries, in spite of the rather heterogeneous growth pace projected by the IMF for the year as a whole. In the case of the Portuguese economy's two largest trading partners, GDP is estimated to contract by 1.5 per cent in Spain and to slow down significantly in Germany from 3.1 per cent in 2011 to 0.9 per cent in 2012. As regards the other main euro area economies, economic activity is likely to contract also in Italy and the Netherlands and to stagnate in France (Table 1.1).<sup>3</sup> In line with the contraction in activity, the labour market conditions deteriorated considerably, and unemployment is forecasted to increase significantly, particularly in the economies undergoing adjustment processes.

In the United States, economic activity is expected to continue to recover, although at a slower pace than in the past, which is clearly not enough to improve the labour market situation indisputably. In spite of an exceptionally high record fall during the 2009 recession, employment has increased very moderately when compared with average growth in previous recoveries. This situation intensified in 2012 (Chart 1.4). In contrast to the euro area, the fiscal consolidation process continued at a slower pace, and greater efforts will be necessary in the medium term in order to reach the required levels. According to the IMF, the fiscal deficit in the United States is projected to remain at 8.7 per cent of GDP in 2012, compared with 3.3 per cent in the euro area as a whole.

A common feature among most of Portugal's main trading partners belonging to the euro area is the significant fall in the contribution of domestic demand to GDP growth in the period following the financial crisis, especially in the countries under stress (Chart 1.5). This trend seems to have been maintained in 2012, with domestic demand expected to contract sharply in Spain and Italy, subtracting around 4 p.p. to annual GDP growth. In contrast, in the United Kingdom and the United States, the pace of growth of domestic demand is likely to increase slightly. The slowdown in domestic demand in Portugal's main trading partners, together with the deceleration in exports, will translate into a decline in imports of goods and services from these economies. In this context, growth of external demand for Portuguese goods and services declined significantly from 3.4 per cent in 2011 to 0.3 per cent in 2012, largely reflecting the decline in euro area imports. The deceleration in external demand is particularly adverse in the present

<sup>2</sup> For the analysis in this Bulletin, this group of countries includes Spain, Greece, Ireland, Italy and Portugal.

<sup>3</sup> Several other euro area countries will probably experience a recession in 2012, namely Greece, Portugal, Slovenia and Cyprus. In the other countries, economic activity is likely to grow at a very slow pace, in most cases below 1.0 per cent.

context, when, due to the adjustment process, the Portuguese economy is more dependent than usual on exports as an engine of overall demand growth.

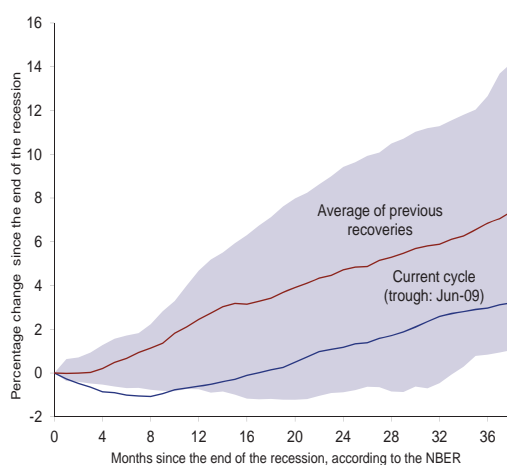
### **Worldwide reduction of inflation in a context of slowing economic activity, in spite of continued high oil prices**

After significant growth in 2010 and 2011, international commodity prices are expected to decelerate in 2012. Given the slowdown in demand by the main advanced and emerging economies, international prices of non-energy commodities in general declined in the period between January and September 2012, translating into a significant fall in year-on-year terms. In the third quarter, however, this trend was to some extent dampened by an upward trend in the international prices of cereals, as a result of the effects of adverse meteorological conditions in the United States, which, in the summer of 2012, had the most serious drought in the last 50 years. In terms of international oil prices, developments in 2012 differed from the downward trend in prices of the other commodities. In effect, oil prices showed some volatility over the year, with an increase in the first quarter that was fully reversed in the subsequent three months. Prices then rose again to stand in mid-October at a level almost 5 per cent above that observed in late 2011. From a short-term perspective, and given the slowdown in global demand, this behaviour has largely reflected disturbances on the supply side associated with the geopolitical tensions persisting in the Middle East, with special reference to the implications arising from the European Union's embargo on oil imports from Iran – the third largest world producer – in force since July 2012.

Against this background, and given the decrease in the utilisation rate of productive factors in advanced economies, IMF forecasts point to a decline in the annual average growth of consumer prices in advanced economies from 2.7 per cent in 2011 to 1.9 per cent in 2012. In emerging market and developing economies, inflation is expected to remain high in 2012 (6.1 per cent), in spite of a 1.1 p.p. decline from 2011.

**Chart 1.4**

#### **EMPLOYMENT DEVELOPMENTS IN THE UNITED STATES | COMPARISON TO PREVIOUS CYCLES**

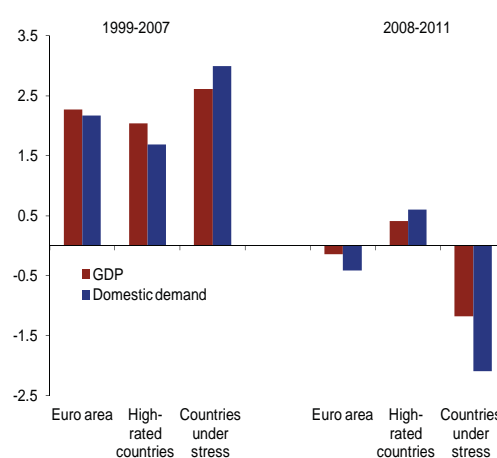


**Sources:** National Bureau of Economic Research, Thomson Reuters and Banco de Portugal calculations.

**Note:** The average, peak and trough correspond to the cycles since 1950, excluding the current cycle.

**Chart 1.5**

#### **GDP AND DOMESTIC DEMAND IN THE EURO AREA | REAL PERCENTAGE CHANGE**



**Sources:** Eurostat and Banco de Portugal calculations.

**Notes:** High-rated countries: Austria, Belgium, Germany, France, Finland, Netherlands. Countries under stress: Spain, Portugal, Italy, Greece, Ireland.



***Confidence in the global financial system has remained exceptionally fragile and downside risks to financial stability have risen considerably***

International financial markets have been characterised by high volatility resulting from considerable fluctuations in risk aversion arising from the sovereign debt crisis in the euro area and uncertainty as to the authorities' response capacity. These aspects are particularly important for the success of the adjustment programme of the Portuguese economy. After some relative improvements in the first months of 2012, tensions returned to the international financial markets, reflecting, at an early stage, doubts about the capacity to meet the fiscal targets in Spain and Italy, in a framework of weak economic growth and, at a subsequent stage, fears about the euro area's own reversibility. In this context, the second quarter saw a broadly based increase in implied volatility in the different markets and a rise in government bond yield spreads within the euro area (Chart 1.6). In addition, main stock indexes fell, particularly in the banking sector, and the euro depreciated in nominal effective terms.

***However, initiatives by the European Commission and the ECB in the second half of 2012, have contributed to a slight improvement compared with late 2011***

Renewed tensions in the second quarter of 2012, in particular the close relationship between sovereign and bank risk in the euro area, stressed the need to adopt additional measures to restore investor confidence. In this context, it is worth highlighting the European Council decision of late June, which seeks to intensify and accelerate the European integration process, namely in the financial sphere (see "Box 1.1 The Banking Union" in this Bulletin). Approximately one month later, at a conference in London, the President of the European Central Bank (ECB) reiterated that the solution for the euro area crisis would include a higher degree of European integration and stated that the euro area is irreversible. In the ECB's assessment, the main short-term challenge is related to reintegrating financial markets in the euro area and restoring the smooth functioning of the monetary policy transmission mechanism. The president has also stated that the central bank will do whatever is necessary to safeguard the singularity of monetary policy and preserve the euro. These statements were followed by the announcement of a new programme of transactions in secondary sovereign bond markets (Outright Monetary Transactions), after the Governing Council meeting in early August (see "Box 1.2 Non-standard monetary policy in main advanced economies" in this Bulletin). Financial markets reacted favourably to this announcement, with a narrowing in government yields in countries under stress and a rise in main stock indexes in the course of September, especially of banks. Simultaneously, the euro inverted the nominal effective depreciation trend recorded since the beginning of the year.

Compared with the end of 2011, when tensions were considerably exacerbated, international financial markets improved, as illustrated by the positive developments of most risk indicators (Chart 1.7). In addition, stock prices rose while government bond yields narrowed. In foreign exchange markets, the euro depreciated against the main international currencies, which translated into a depreciation in nominal effective terms between December 2011 and mid-October 2012. These developments tend to improve euro area price competitiveness *vis-à-vis* third countries, and to stimulate growth of exports to non-euro area economies, as was observed in the Portuguese economy.

***Monetary policy maintained an expansionary stance in 2012***

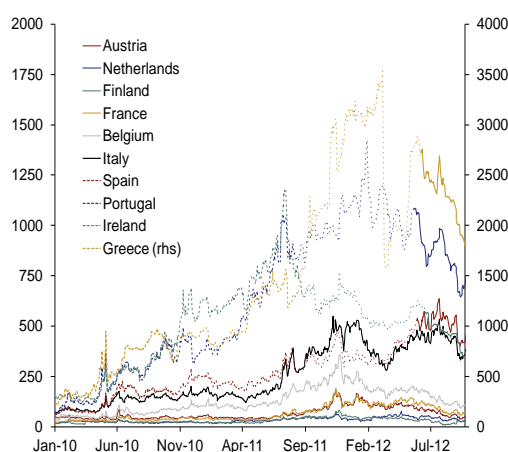
Against a background of slowdown or even contraction of economic activity, monetary policy has become more expansionary worldwide. Official interest rates have declined in some emerging and developing economies (for instance, China and Brazil) and also in some advanced economies. In parallel, central banks in main advanced economies have extended the use of non-standard measures adopted in the past. In the case of the Eurosystem, it should be noted that the Securities Market Programme was actively used during the first quarter of 2012. Subsequently, no more purchases were made until the programme was

discontinued in early September (for a more detailed analysis of the ECB's monetary policy in 2012, see the next section in this Bulletin). In contrast, in the United Kingdom and Japan, monetary authorities raised the amounts of the respective asset purchase programmes on several occasions in the course of 2012.<sup>4</sup> In the United States, the Federal Reserve announced in June that the programme to extend the maturity of its holdings of Treasury securities would continue through the end of the year, as well as the intention to carry on its policy of reinvestment in written-off assets.

Following the sharp deterioration of the international economic and financial framework during the second quarter, and since the official interest rates remained at levels close to zero in some countries, the central banks of the main advanced economies, including the ECB, adopted further non-standard monetary policy measures during the second half of the year (see "Box 1.2 *Non-standard monetary policy in main advanced economies*", in this Bulletin).

Chart 1.6

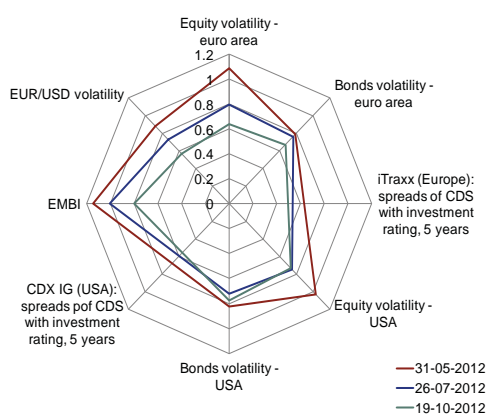
10-YEAR GOVERNMENT BOND YIELDS | SPREADS  
AGAINST GERMANY, BASIS POINTS



Source: Thomson Reuters.

Chart 1.7

FINANCIAL MARKET RISK INDICATORS



Sources: Bloomberg, Thomson Reuters and Banco de Portugal calculations.

Note: Ratio of the values of the indicator on the mentioned date to 30 December 2011.

<sup>4</sup> The Bank of England decided to raise the amount of its asset purchase programme in February and July 2012 by GBP 50 billion on each occasion. The total amount of scheduled purchases corresponds to GBP 375 billion. The Bank of Japan raised the amounts involved in its asset and loan purchase programme on three occasions in 2012 (in February, April and September). In total, the size of the programme increased from JPY 55 trillion to JPY 80 trillion.

## BOX 1.1 | THE BANKING UNION

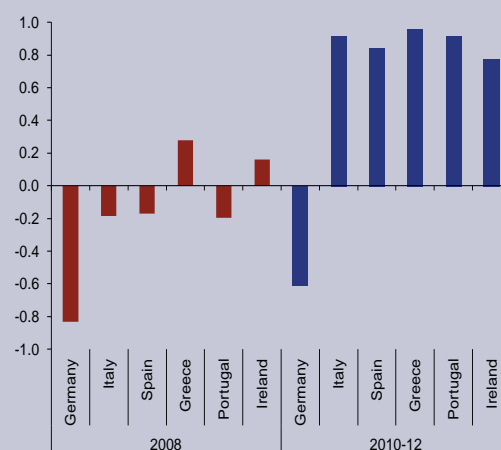
More than two years after the onset of the sovereign debt crisis in the euro area, money and financial market conditions remain extremely fragile, despite the ECB's and the European Union's (EU) response. The increased risk aversion stemming from the international financial crisis entailed closer scrutiny of the fiscal and structural situation of countries by international investors, with the emergence of high credit risk premia in the pricing of supposedly "risk-free" government debt securities issued by some euro area countries. In 2012 sovereign debt market tensions were extended to a growing number of countries, including two of the largest euro area economies, more specifically, Italy and Spain. In turn, the close link between sovereigns and their banking systems, visible in, among other indicators, the increase of the correlation between government bond yields and credit default swaps for banks over the past two years in several countries (Chart 1), implied a growing fragmentation of euro area credit markets. This severely hinders the unity and integrity of the European single market for financial services and jeopardises the efficient monetary policy transmission in the euro area.

The problems experienced over the past two years somewhat reflect inconsistencies in the integration process and an EU governance model that allowed the accumulation of substantial macroeconomic imbalances in several countries. The adjustment process for these imbalances affects the financial sector situation and contributes to a weakening of economic activity and to the increase in risks to the stability of the monetary union. Against this background, in the European Council at the end-June, it was proposed to intensify and accelerate the European integration process, namely through the establishment of a banking union with the purpose of restoring confidence in the financial sector in general and, therefore, fostering greater financial integration and ensuring an adequate flow of credit to the real economy.<sup>1</sup>

The creation of a banking union implies the transfer of banking supervision tasks to the European level, through a single supervisory authority with direct oversight of all euro area banks. The centralisation of responsibility and decision-making at this level contributes to a more uniform implementation of rules governing banking activities, a better oversight of risks taken by banks and the minimisation of the probability of future crises. However, for this purpose, the single supervisory mechanism should be

Chart 1

### CORRELATION BETWEEN 10-YEAR GOVERNMENT BOND YIELDS AND 5-YEAR CDS OF BANKS



Sources: Thomson Reuters and Banco de Portugal calculations.

<sup>1</sup> The banking union is an integral part of the vision for the future of the Economic and Monetary Union proposed by the presidents of the European Council, the European Commission, the European Parliament and the ECB that was presented and discussed at the European Council at the end-June (Towards a genuine economic and monetary union, June 2012). The remaining elements of a more robust institutional structure rely on greater integration at the fiscal and economic policy levels, sustained by strengthened democratic legitimacy and accountability.

complemented with other measures, namely a European bank resolution fund that facilitates banks restructuring without affecting the systemic stability and the financial situation of countries where these banks operate and a common deposit insurance system. Given the strong interlink between these elements, progress should ideally cover these three fields at the same time so as to align supervisory and financial stability responsibilities.

In September, the European Commission proposed the establishment of a single supervisory mechanism for euro area banks as a first step towards the creation of a banking union, where the ultimate responsibility in the field of supervision would lie with the ECB.<sup>2</sup> In addition to being envisaged in the Treaty on the Functioning of the European Union (Article 127(6)), the choice of the ECB is warranted due to its independence, i.e. the absence of incentives to protect national interest and/or penalise cross-border financing. In the Commission's proposal, the ECB will oversee all euro area banks (around 6,000) and not only large banks. Indeed, recent experience has shown that problems within small banks may cause severe systemic damage. This proposal was presented and discussed at the European Council on 18-19 October, and the need to quickly move forward to an integrated financial structure was stressed again, open as much as possible to all countries that wish to participate. The Council called for an agreement on the legal framework up to 1 January 2013, which would make it possible to launch the single supervisory mechanism in the course of 2013. This implementation should take into account a number of aspects, such as:

- The need to clearly separate the ECB monetary policy decisions from its supervisory functions and to guarantee equal treatment and representation of Member States participating in the supervisory mechanism, regardless of whether they belong to the euro area or not;
- For effectiveness and efficiency purposes, an integrated decision-making system should be put in place, delegating the implementation of supervisory tasks to the national authorities;
- Importance of the adoption of a single set of prudential rules.

Finally, it is important to quickly adopt provisions on the harmonisation of national resolution and deposit guarantee frameworks so that it can be possible to move towards the establishment of a single banking crisis resolution mechanism and a single deposit guarantee scheme, which are the remaining pillars for the materialisation of the union banking and, in time, to break the link between sovereign risk and banking system risk.

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<sup>2</sup> The European Commission has also presented a legislative proposal on the adaptation of the regulation on the European Banking Authority in the context of a single supervisory mechanism and called for the conclusion of the ongoing regulatory reform of the single financial market (the "single set of rules"). This set of rules includes stricter prudential rules, particularly as regards capital requirements applicable to banks, proposals for the harmonisation and simplification of national deposit guarantee schemes and proposals for a common framework of rules for bank recovery and resolution.

## BOX 1.2 | NON-STANDARD MONETARY POLICY IN MAJOR ADVANCED ECONOMIES

In the third quarter of 2012, there was a wave of announcements of new non-standard policy measures by the Bank of England, the ECB and the US Federal Reserve. The new measures were taken against a background of decreasing inflationary pressures, in line with the deterioration in economic activity and, in the case of the euro area, driven by the need to break the link between sovereign risk and banking risk and restore the smooth functioning of the monetary policy transmission mechanism.

In early August, the ECB announced a new programme for transactions of short-term government debt securities in the secondary market. This programme, called Outright Monetary Transactions (OMTs), is mainly aimed at correcting severe distortions in sovereign debt markets stemming, in particular, from investors' fears as to the reversibility of the euro area. The modalities for undertaking OMTs, presented at the Governing Council's September meeting, provide for purchases of sovereign debt securities in the secondary market with no ex-ante limits, conditional on the adoption of a strict macroeconomic, structural, fiscal and financial adjustment plan on the part of the issuer country under the European Financial Stability Facility/European Stability Mechanism (EFSF/ESM) (Table 1).<sup>1</sup> Following these decisions, the former Securities Markets Programme, in force since 2010, was cancelled. The liquidity injected through this programme will continue to be absorbed as in the past and the securities included in the portfolio will

**Table 1**

### MAIN FEATURES OF OUTRIGHT MONETARY TRANSACTIONS (OMTs)

Feature	Meaning	Relevance
Strict and effective conditionality	For transactions to be conducted it is necessary: - a full EFSF/ESM macroeconomic adjustment programme; or - a precautionary programme under the Enhanced Conditions Credit Line provided that they include the possibility of EFSF/ESM primary market purchases.  Transactions will be terminated when: - their objectives are achieved; - there is non-compliance with the macroeconomic adjustment or precautionary programme.	Ensuring that national authorities play their role in the resolution of domestic macroeconomic imbalances and guarantee a sustainable fiscal path in the long run.  The Governing Council has stated that the involvement of the IMF would be sought for the design of the country-specific conditionality and the monitoring of such a programme.
Coverage	Transactions will be focused on the shorter part of the yield curve and, in particular, on sovereign bonds with a maturity of between one and three years.	These maturities are the most affected by the existence of risk premia demanded by investors due to fears about the reversibility of the euro area.
Amounts	No ex ante quantitative limits are set on the size of transactions.	Making it clear that, within its mandate, the ECB is committed to do whatever it takes to guarantee an efficient monetary policy transmission and preserve the single currency.
Creditor treatment	The Eurosystem accepts the same treatment as private or other creditors with respect to bonds issued by euro area countries.	Promoting the permanence of private investors in the market.
Sterilisation	The liquidity created through these transactions will be fully sterilised.	Not changing aggregate liquidity, given that this is not the purpose of OMTs.

**Sources:** BCE and Banco de Portugal.

<sup>1</sup> OMTs may also be considered for countries currently subject to a macroeconomic adjustment programme as soon as they regain access to bond markets. For more information, see the ECB press release "Technical features of Outright Monetary Transactions" of 6 September 2012.

be held to maturity. Moreover, the Governing Council has decided to introduce changes to the eligibility of central government assets and widen the list of eligible collateral for Eurosystem operations.<sup>2</sup>

Euro area developments have negatively affected bank financing conditions in the United Kingdom, leading to higher interest rates and the reduced availability of banking credit to the economy. In this context, in July, the Bank of England, together with the British government, implemented the Funding for Lending Scheme, which is designed to encourage banks to boost their lending.<sup>3</sup> Up to the end of January 2014, credit institutions may borrow UK Treasury bills from the Bank of England for a period of up to 4 years against loans and other assets. This type of transaction is known as a “collateral swap”.<sup>4</sup> In turn, credit institutions can use Treasury bills to borrow money from the central bank to lend to enterprises and households under the Funding for Lending Scheme. The more the banks expand their lending, the more favourable financing conditions they will get, in terms of both volume and interest rates.

In the United States, the Federal Reserve decided in September to implement a new asset purchase programme – the third programme announced since the onset of the financial crisis – for the purchase of mortgage-backed securities at a pace of USD 40 billion per month.<sup>5</sup> The reasoning behind the adoption of these measures differed from the ones presented by the European counterparties to the extent that it was mainly focused on the absence of a sustained improvement in labour market conditions due to the weak pace of economic growth. In contrast to the previous two programmes, this is an open-ended programme in terms of both volume and duration. Indeed, the programme should remain in place until the labour market outlook improves substantially in a context of price stability. The monetary authority has also signalled that, should this target not be met, it is willing to adopt further measures. The definition of the target in terms of future labour market conditions is unprecedented, particularly taking into account that labour market variables tend to be harder to influence by monetary policy instruments than economic activity. At its September meeting, the Federal Reserve stressed again that the key interest rate will remain at exceptionally low levels for a considerable period of time (up to mid-2015), which compares with the end of 2014 in previous announcements. Moreover, the Federal Reserve has announced that the highly accommodative monetary policy stance shall remain adequate “for a considerable period after the economic recovery strengthens”. This commitment is relatively innovative in terms of communication and is in line with recent recommendations by a number of economists.<sup>6</sup>

<sup>2</sup> For more information, see the ECB press release “*Measures to preserve collateral availability*” of 6 September 2012.

<sup>3</sup> For more information, see the press release “*Bank of England and HM Treasury announce launch of Funding for Lending Scheme*” of 13 July 2012.

<sup>4</sup> When the loans mature, the collateral is swapped back again, which ensures that the risk from the loans remains the responsibility of the originating bank.

<sup>5</sup> For more information, see the Federal Reserve press release following the meeting on 13 September 2012 (“FOMC statement-September 13, 2012”).

<sup>6</sup> See, for instance, Woodford, M. (2012), “*Methods of Policy Accommodation at the Interest Rate Lower Bound*”, presented at the Federal Reserve Bank of Kansas City symposium “*The Changing Policy Landscape*”, Jackson Hole, 31 August -1 September.

## 2. Monetary policy of the ECB and economic and financial conditions of the Portuguese economy

### 2.1. Monetary policy of the ECB

Inflation in the euro area was somewhat resilient in 2012, sustained by high international oil prices, the depreciation of the euro and rises in administered prices and indirect taxes in some euro area countries, within the scope of their fiscal consolidation processes. The year-on-year growth of the Harmonised Index of Consumer Prices (HICP) remained above 2 per cent in the first three quarters of the year, to stand at 2.6 per cent in September (0.1 p.p. below the figure for December 2011). According to the Governing Council of the ECB, inflation is expected to remain elevated in the coming months, reflecting the recent trend of food and energy commodity prices, and to drop to below 2 per cent in the course of 2013 amidst weak economic growth. In the absence of considerable medium-term inflationary pressures and with well anchored long-term inflation expectations, the ECB continued to focus on restoring the smooth functioning of the monetary policy transmission mechanism and in this way on guaranteeing price stability over the medium term.

#### ***In the first few months of 2012 took place the implementation of the measures announced by the Governing Council of the ECB at the end of 2011***

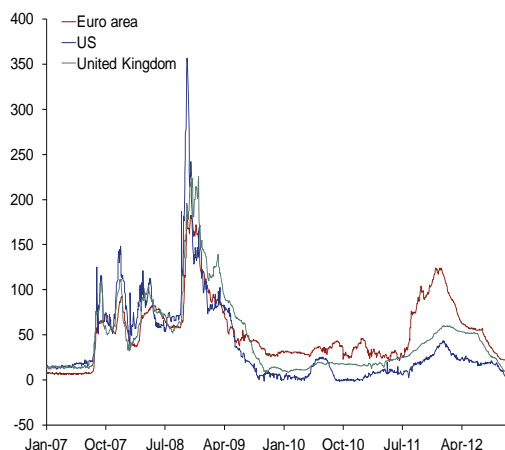
On 29 February the second longer-term refinancing operation (LTRO) with a maturity of three years was conducted,<sup>1</sup> following the reduction of the reserve ratio to 1 per cent as of 18 January and the approval of eligibility criteria and risk control measures for the temporary acceptance in various countries of additional bank loans as collateral in Eurosystem operations. These measures were key in containing the escalation of market tensions, contributing to avoid a banking crisis in the euro area. In particular, participation in LTROs with a maturity of three years exceeded expectations, covering 523 institutions in the December operation and 800 institutions in the February operation. These, as a whole, received approximately EUR 1 trillion. Immediately after these operations, especially the first one, euro area money market participants reported an improvement in liquidity conditions, with a rebound in activity in shorter maturities and a narrowing in spreads between uncollateralised and collateralised interest rates. For the three-month maturity this spread narrowed from around 120 basis points (b.p.) at the end of December 2011 to close to 60 b.p. in late March 2012. In comparison with other advanced economies, and contrary to 2008 after the failure of Lehman Brothers, this spread remains wider in the euro area than in the United States and the United Kingdom (Chart 2.1.1).

Despite the improved liquidity conditions of credit institutions, persisting signs showed that the functioning of the money market had not yet returned to normal, namely a low volume of money market transactions and weak market participation of institutions from countries under stress, which continued to largely depend on the Eurosystem for funding (Chart 2.1.2). This was the case for Portuguese banks, as reflected in the composition of the financial account (see “Section 5.5 *Balance of payments*”, in this Bulletin). According to the euro money market survey conducted by the ECB in the second quarter of 2012, the volume of transactions dropped by 14 per cent when compared to the second quarter of 2011 and continued to be concentrated in the collateralised segment. The qualitative assessment of survey participants also showed a deterioration of liquidity conditions compared with the same period in 2011. The spread between uncollateralised and collateralised interest rates remained virtually unchanged over the second quarter, standing at 55 b.p. at the end of June, declining further following the ECB decisions in the second half of the year (Chart 2.1.1).

<sup>1</sup> The first LTRO with a maturity of three years was conducted on 21 December 2011.

Chart 2.1.1

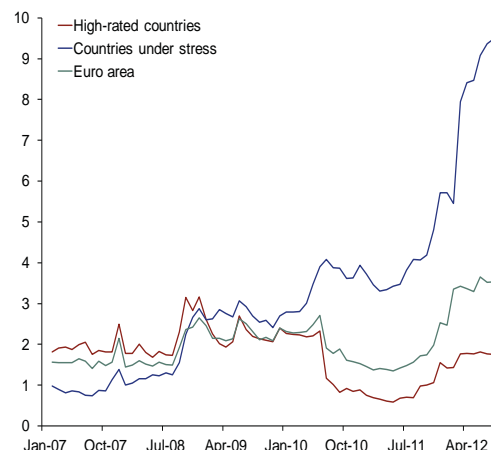
**3-MONTH MONEY MARKET INTEREST RATES | SPREADS BETWEEN UNCOLLATERALISED AND COLLATERALISED OPERATIONS, IN BASIS POINTS**



Source: Thomson Reuters.

Chart 2.1.2

**RECOURSE TO REGULAR EUROSISTEM OPERATIONS | AS A PERCENTAGE OF BANKING SYSTEM ASSETS**



Sources: ECB, Euro Crisis Monitor – Osnabruek University and Banco de Portugal calculations.

Notes: High-rated countries: Austria, Belgium, Germany, France, Finland, the Netherlands.

***Against a background of marked deterioration of the outlook for economic growth and greater uncertainty in the second quarter of 2012, the ECB adopted a series of additional measures***

At its meeting in early June the Governing Council announced that liquidity would continue to be supplied through fixed rate tender procedures with full allotment for as long as deemed necessary (and at least until 15 January 2013) and six additional three-month LTROs would be conducted up to the end of 2012. On 20 June 2012 the Governing Council of the ECB decided to further increase the collateral eligible for Eurosystem refinancing operations.<sup>2</sup> In early July the Governing Council decided to decrease key interest rates by 25 b.p., i.e. the interest rate on the main refinancing operations to 0.75 per cent and the rates on both the deposit facility and the marginal lending facility to 0.00 and 1.50 per cent, respectively.

The latter decision translated into a steepening of the downward trend of money market interest rates observed since the beginning of the year. In mid-October three-month Euribor rates stood at 0.2 per cent, i.e. the lowest level since 1999, and more than 110 b.p. below the level recorded in December 2011. By contrast, interest rates on loans to the private sector in the euro area declined only slightly in 2012, suggesting a less efficient transmission of official rates to bank lending rates, particularly in some euro area countries. From December 2011 to August 2012 interest rates on new bank loans to households in the euro area declined by only 50 b.p. in the housing segment, while rates on short-term consumer loans rose by around 50 b.p. in the same period. Interest rates on new loans of up to EUR 1 million to non-financial corporations in the euro area declined by 50 b.p., reflecting different trends across countries. In fact, the recent reduction of key ECB interest rates was accompanied by a decline in lending rates in some countries and virtually no change or even an increase in lending rates in other countries (Chart 2.1.3).

<sup>2</sup> Reduction of the minimum credit rating threshold and change of the eligibility requirements with regard to certain asset-backed securities.



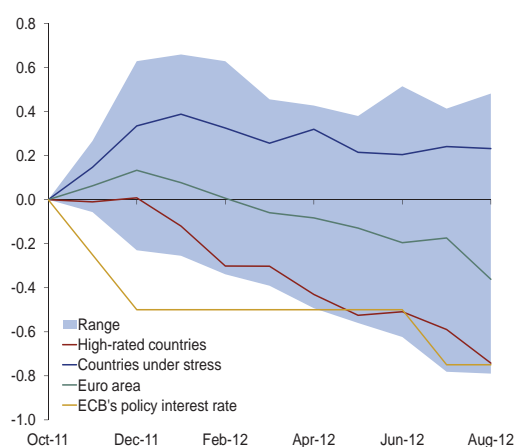
### **Efficient monetary policy transmission was compromised by fragmented euro area credit markets**

Recent developments in interest rates on loans to the private sector in several euro area countries reflect not only a specific set of fundamentals for each economy, but also the segmentation of euro area credit markets resulting from an interaction between perceived sovereign risk and banks' solvency (see the Highlight theme "The transmission of monetary policy in the euro area" in this Bulletin). The causality between sovereigns and banks works both ways: the sovereign risk is exacerbated by a perceived need for government intervention to ensure financial stability; in turn, as banks are the main holders of national sovereign debt securities, greater sovereign risk translates into a deterioration in banks' balance sheets and consequently an increase in their financing costs. In addition, the need for fiscal consolidation has a negative impact on economic activity in the short term and leads to higher materialisation of bank portfolio credit risk. In this context, concerns as to sovereign solvency foster concerns as to banks' solvency and vice versa, which leads to markedly different financing conditions for credit institutions depending on their country of origin. This differentiation in monetary policy transmission was the main driver of the announcement by the Governing Council of the ECB in early August relating to the implementation of a new programme of Outright Monetary Transactions in secondary markets for sovereign bonds (see "Box 1.2 Non-standard monetary policy in major advanced economies", in this Bulletin).

Market fragmentation has also a negative impact on bank lending to the economy, as illustrated by heterogeneous developments in loans to the private sector across euro area countries (Chart 2.1.4). Between late 2011 and August 2012 bank loans to the private sector moderated in the group of high-rated countries and contracted significantly in countries under stress, notably Portugal (see the following sub-section for a more detailed analysis of the Portuguese economy's monetary and financial conditions). In the euro area as a whole the annual growth rate of loans to the private sector declined from 1.2 per cent in December to -0.2 per cent in August, chiefly as a result of the contraction in loans granted to non-financial corporations, but also of the slowdown of credit granted to households (annual growth of -0.5 and 1 per cent in August 2012, respectively).

**Chart 2.1.3**

**ECB POLICY RATE AND BANK LENDING RATES ON NEW LOANS TO NON-FINANCIAL CORPORATIONS | CUMULATIVE CHANGES, IN PERCENTAGE POINTS**

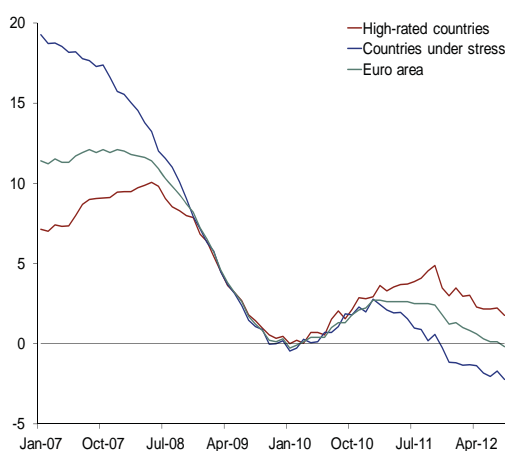


**Sources:** ECB and Banco de Portugal calculations.

**Note:** The range is defined by the 10th and 90th percentiles of cumulative changes per country in interest rates on new loans to non-financial corporations of up to EUR 1 million.

**Chart 2.1.4**

**ANNUAL GROWTH OF LOANS TO THE PRIVATE SECTOR | IN PERCENTAGE**



**Sources:** ECB and Banco de Portugal calculations.

**Notes:** High-rated countries: Austria, Belgium, Germany, France, Finland, the Netherlands. Countries under stress: Spain, Portugal, Italy, Greece, Ireland.

## 2.2. Monetary and financial conditions of the Portuguese economy

The ECB's non-standard monetary policy decisions, together with the recent bank capitalisation, have made it possible to improve banks' liquidity and capital positions, by reducing potential restrictions to credit supply stemming from banks' balance sheets. More recently, the ECB's announcement of the Outright Monetary Transactions programme has also resulted in a lower perception of risk among international investors regarding the Portuguese State (sovereign risk) and banks. However, credit supply remains constrained by greater risk perception by banks (counterparty risk), amid heightened uncertainty, high indebtedness and the deteriorating financial standing of companies and households. In parallel, even though deposit interest rates have started to decline, bank lending costs remained high. In addition, high bank capitalisation costs with public funds have made a positive contribution in this domain. However, there is evidence that the tightening of credit standards started to be mitigated in the course of 2012, albeit with considerable heterogeneity among companies. In this context, both large and exporting enterprises have maintained their access to domestic credit or found alternative sources of financing, while small and medium-sized enterprises have continued to face tighter financing conditions.

### ***The Portuguese economy's financing conditions coincide with disruptions in the monetary policy transmission mechanism in the euro area and structural adjustment of the economy***

As in other countries under stress, monetary and financial conditions of the Portuguese economy have been disrupted by a malfunctioning monetary policy transmission in the euro area, particularly as a result of redenomination risks. This situation affects international investors' expectations and strategies, with negative consequences for the financing of the State, banks and, consequently, the economy (see "Article *Monetary policy transmission in the euro area*", in this Bulletin). At the same time, the Portuguese economy is undergoing significant structural adjustment, which reflects on the financial standing of the private sector.

The Portuguese banking system occupies a pivotal position in the adjustment process. Amid some segmentation of euro area financial markets, banks must gradually deleverage their balance sheets with the purpose of regaining access to markets in the medium run, being that in the case of Portugal, this deleveraging was facilitated by the resilience of household deposits. In turn, deleveraging of private balance sheets, partly associated with the structural adjustment in the economy, has a direct impact on banks' business, given that they intermediated a considerable share of the increase in external indebtedness. This mutual interaction dynamics between the financial and real sectors is also heightened by the well-known (pro-cyclical) financial accelerator mechanisms. The ongoing restructuring of the economy inevitably leads to significant changes in the dynamics and distribution of financial flows between non-financial corporations and, as such, it is important to gauge its impact on the most buoyant and productive sectors of the economy.

### ***Tightening of credit standards started to be mitigated in the course of 2012, albeit with considerable differentiation between companies***

In an environment of high uncertainty – related to the current sovereign debt crisis in the euro area and the challenges stemming from internal adjustment –, banks have tightened their credit standards considerably over 2011 and 2012, in terms of both volume and prices. This tightening was associated with several interrelated factors.

Firstly, the downturn in economic activity has resulted in a severe deterioration in credit quality. Indeed, there was a significant increase in credit risk indicators, which despite being widespread, varied depending on the size of the company and its exposure. Larger companies/exposures continued to experience substantially lower default ratios, although the ratios of new defaults have increased significantly.

Moreover, as expected, the increase in default was disproportionally concentrated on those sectors most exposed to domestic economic developments.

Secondly, the perception of risk among banks has increased significantly, as a response to the cyclical deterioration and in anticipation of a structural change. As expectable, perceived risk increases in the case of smaller companies more exposed to domestic developments. This leads to credit flows being channelled towards companies considered less risky.

Thirdly, given the segmentation of euro area financial markets and difficulties faced by banks in accessing wholesale international debt markets – amid a high degree of sovereign risk –, there was an increase in their cost of funds (Table 2.2.1). Consequently, competition for domestic savings has grown, which was particularly reflected in an aggressive commercial policy as regards deposits. The negative effects of these developments were mitigated by prudential measures implemented by Banco de Portugal and the ECB's non-standard monetary policy measures, particularly in the case of deposits from non-financial corporations. Accordingly, Portugal's situation moved closer to that seen in the remaining euro area countries (Charts 2.2.1 to 2.2.3). Between the second half of 2010 and the first half of 2012, implicit costs of interest-bearing bank liabilities rose by around 0.8 p.p., which compares with an increase of approximately 0.7 p.p. in implicit return on interest-bearing bank assets. During 2012 these figures started to decline. In the case of interest-bearing liabilities, this reduction was mostly due to the impact of increased ECB financing, while in the case of interest-bearing assets the reduction was widespread. Overall, the differential between interest-bearing assets and liabilities (as well as the return differential between credit and deposits) remained virtually unchanged at low levels up to the end of 2011, and started to narrow in the course of 2012.

**Table 2.2.1**

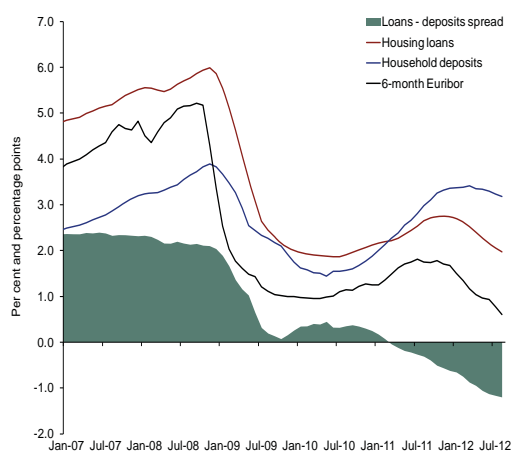
IMPLICIT AVERAGE INTEREST RATES OF THE MAIN BALANCE SHEET ITEMS <sup>(a)</sup>   PER CENT					
	2010		2011		2012
	H1	H2	H1	H2	H1
Interest-bearing assets	3.05	3.26	3.64	4.19	3.99
<i>Of which:</i>					
Interbank assets <sup>(b)</sup>	1.30	1.66	2.00	2.25	1.81
Non-interbank assets					
Credit	3.33	3.56	4.03	4.68	4.53
Securities	4.19	4.12	4.48	5.14	5.07
Interest-bearing liabilities	1.71	1.84	2.25	2.70	2.65
<i>Of which:</i>					
Interbank liabilities <sup>(c)</sup>	1.25	1.28	1.80	2.24	1.83
Non-interbank liabilities					
Deposits	1.38	1.60	2.06	2.67	2.77
Securities	2.52	2.96	3.19	3.55	3.80
Subordinated liabilities	3.34	3.15	3.41	3.91	3.84
Spreads (percentage points):					
Interest-bearing assets – interest-bearing liabilities	1.34	1.42	1.39	1.49	1.34
Credit-deposits	1.95	1.96	1.97	2.01	1.76

**Source:** Banco de Portugal.

**Notes:** (a) Implicit average rates of change calculated as the ratio of interest flows in the period under review to the average stock of the corresponding balance sheet item. (b) Includes cash, demand deposits with Banco de Portugal, claims on credit institutions and investments in credit institutions. (c) Includes resources from central banks and other credit institutions.

Chart 2.2.1

## INTEREST RATES ON HOUSING LOANS AND HOUSEHOLD DEPOSITS (OUTSTANDING AMOUNTS)

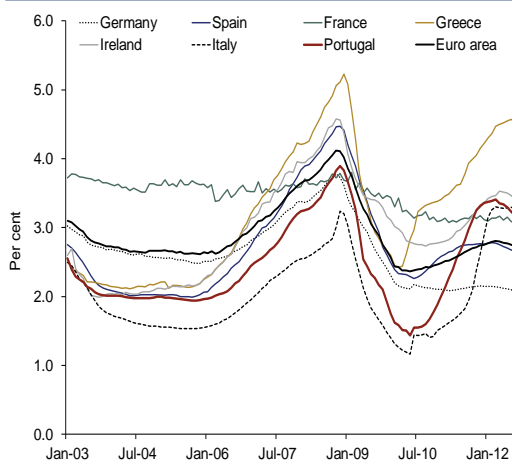


Sources: ECB and Banco de Portugal.

Note: Latest observation: August 2012.

Chart 2.2.2

## INTEREST RATE ON DEPOSITS FROM HOUSEHOLDS (OUTSTANDING AMOUNTS)

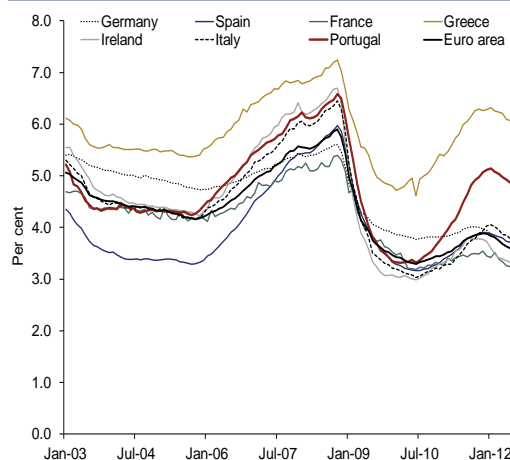


Sources: ECB and Banco de Portugal.

Note: Latest observation: August 2012.

Chart 2.2.3

## INTEREST RATE ON DEPOSITS FROM NON-FINANCIAL CORPORATIONS (OUTSTANDING AMOUNTS)



Sources: ECB and Banco de Portugal.

Note: Latest observation: August 2012.

Finally, housing loans with fixed and low spreads account for around 45 per cent of the loan portfolio to the non-financial private sector held by the banking system<sup>3</sup> (Chart 2.2.1). Given the rigidity of this balance sheet component and taking into account the need to maintain the financial margin, this pressure on bank profitability was reflected in the spreads on new operations, particularly spreads on new

<sup>3</sup> From the viewpoint of households with housing loans, the fact that the interest rate on these loans is linked to the Euribor rate and has fixed and low spreads, together with the decline in money market interest rates (around 150 basis points since the last quarter of 2011), have resulted in a highly significant favourable impact on their disposable income (see "Box 4.1 The impact of money market interest rates on Portuguese households' disposable income" in this Bulletin).

loans to non-financial corporations, against a background of uncertainty and higher perceived risk.<sup>4</sup> This was observed across the entire interest rate spectrum. Given the relatively short maturities that typically characterise these loans, interest rates on outstanding loans have also increased substantially (Chart 2.2.3). Indeed, these interest rates have departed from the corresponding euro area averages as from mid-2010, with spreads *vis-à-vis* Euribor rates reaching a peak in early 2012. Against this background, the average maturity of loans has increased – despite a decline in corporate investment –, which largely reflects the restructuring of loans.

The latest evidence suggests that the above-mentioned trends are, even if only embryonically, being reversed (Table 2.2.1). Indeed, the aggregate solvency and liquidity levels of the banking system have improved significantly during 2012. On the one hand, the wide range of non-standards measures adopted by the Eurosystem – including the long-term supply of liquidity and decisions on the expansion of eligible collateral – favourably affected banking system liquidity. On the other hand, recent capitalisation efforts, against the backdrop of the capital exercise by the European Banking Authority and changes to capital requirement rules fostered by Banco de Portugal, resulted in a clear improvement in solvency. In this context, interest rates on new operations and outstanding loans to non-financial corporations have recently resumed a downward trend, similarly to the euro area average, reflecting developments in and expectations about Eurosystem rates. In an environment where monetary policy transmission diverges across euro area countries, the degree of disruption to the monetary policy transmission in Portugal does not seem to have intensified over the past few months. This is also confirmed by the findings of the latest bank lending survey, which show that the upward trend in the tightening of credit standards for loans to non-financial corporations (since mid-2010) has started to be mitigated in 2012 (Table 2.2.2). This conclusion remains valid even though banks indicated in the latest survey that risks associated with expectations about general economic activity and specific sectors have significantly increased their contribution to a tightening in credit standards for loans to enterprises. To date, the cost of credit has not diverged much depending on the characteristics of each company. This indicates that the increase in banks' cost of funds, together with pressures on the financial margin stemming from the rigidity in a number of balance sheet components, are likely to have been behind the rise in interest rates on loans to enterprises. Indeed, banks have used the volume of credit as a differentiating factor for the supply of loans across enterprises. However, in the context of a deterioration in the perception of risk among banks, a greater differentiation of the cost of credit across companies cannot be excluded, thereby mitigating the favourable impact from a decrease in banks' cost of funds. Differentiation of financing conditions across companies, in line with expectations

To form a comprehensive portrait of total financing to the corporate sector, it is necessary to assess developments in all sources of financing for companies, including not only loans granted by resident banks, but also loans by non-resident financial institutions, debt issuance (held by residents and non-residents), trade credits (by residents and non-residents) and Treasury loans, in the case of public enterprises.

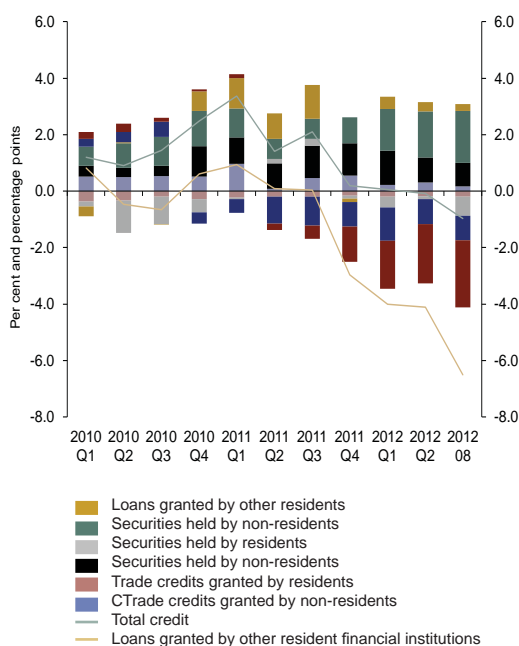
Total credit granted to non-financial private corporations has decelerated since mid-2011, with a slightly negative year-on-year rate of change in August (Chart 2.2.4). There is a considerable difference between domestic and non-domestic sources of financing to non-financial private corporations. In fact, only non-residents have contributed positively to total credit dynamics, as reflected by the various sources of financing for companies (loans, debt securities and trade credits).

The more favourable developments in total credit compared with domestic credit were mainly determined by credit flows to large enterprises. Indeed, several large enterprises, which are internationally active and/or are part of international groups, have consistently increased recourse to non-resident financing

<sup>4</sup> With regard to series for Portugal, interest rates on new loans to non-financial corporations are systematically biased upwards due to the higher implicit proportion of very short-term loans, which are typically characterised by higher interest rates (this is particularly relevant in the case of loans to non-financial corporations of up to EUR 1 million).

Chart 2.2.4

## CREDIT GRANTED TO NON-FINANCIAL PRIVATE CORPORATIONS | CONTRIBUTIONS TO THE ANNUAL RATE OF CHANGE



Source: Banco de Portugal.

Quadro 2.2.2

## MAIN RESULTS OF THE QUARTERLY BANK LENDING SURVEY

		2010				2011				2012			
		I	II	III	IV	I	II	III	IV	I	II	III	IV (E)
Restrictiveness of supply to enterprises	Overall	20	70	60	60	70	70	80	70	20	20	10	10
Restrictiveness factors	Costs related to the bank's capital position	20	40	50	40	50	60	70	60	40	40	40	-
	Bank's ability to access market financing	20	70	60	60	80	70	70	70	20	20	20	-
	Bank's liquidity position	20	50	60	60	60	60	60	50	10	0	0	-
	Risks associated with expectations regarding general economic activity	30	50	60	80	70	80	80	70	50	40	70	-
	Risks associated with industry or firm-specific outlook	40	50	40	50	40	60	80	70	40	40	60	-
	Risks on collateral demanded	20	30	30	40	20	30	40	60	40	30	30	-
Demand by enterprises	Overall	0	0	0	-20	-30	-30	-50	-20	0	-20	-10	-10
Purpose of demand	Fixed investment	-30	-50	-40	-50	-40	-60	-90	-60	-50	-60	-70	-
	Inventories and working capital	20	0	30	0	-20	0	-10	30	50	40	30	-
	Mergers/acquisitions and corporate restructuring	-10	-30	-10	-30	-50	-40	-60	-40	-40	-20	-10	-
	Debt restructuring	20	20	40	30	20	30	30	60	60	60	70	-

**Notes:** For questions concerning credit supply, values exceeding 0 indicate a tightening in credit standards compared with the previous quarter, while values of less than 0 mean a loosening in credit standards. For questions about credit demand, higher (lower) values mean an increase (decline) in demand. The diffusion index varies between -100 and 100, with 0 meaning that there were no changes from the previous quarter. (E) Respondent banks' expectations for the last quarter of the year at the beginning of October.

(Chart 2.2.5). Moreover, a number of large Portuguese enterprises have also issued debt securities, placed by banks with their retail customers.

Access to sources of financing from non-banks and/or non-residents is not within reach of small and medium-sized enterprises. This difficulty to access the various sources of financing is reflected in total credit dynamics by size of enterprise (Charts 2.2.5 and 2.2.6).<sup>5</sup> While total credit to large enterprises has grown slightly more than 5 per cent (approximately 2 per cent in the case of loans granted by resident banks), total credit to micro enterprises dropped by around 5 per cent (11 per cent reduction in the case of financing by resident banks). Developments in total credit to medium-sized enterprises held an intermediate position (decline by around 2 per cent). This also mirrors the strong dependence of smaller enterprises – which, on average, entail the highest credit risk – on bank financing.

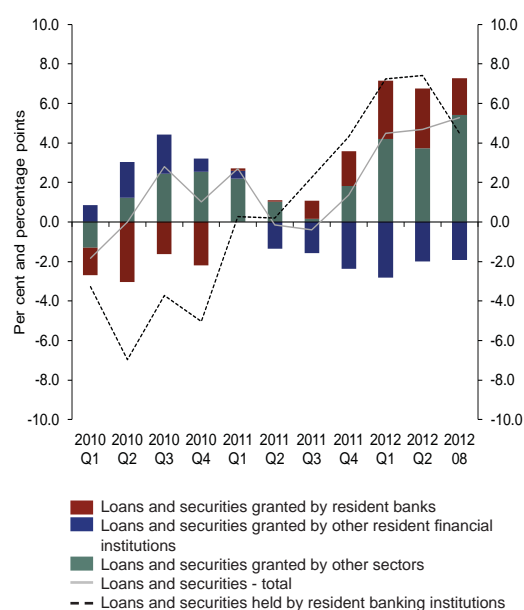
The case of public enterprises that do not consolidate with the general government is particularly worth noting. Total credit to public enterprises has decelerated over the past few quarters, and in August its growth rate stood close to zero. Among other factors, this reflects the ongoing implementation of plans to restructure state-owned enterprises, which has contributed to a reduction in borrowing requirements. It should also be noted that bank loans to this sector have grown at very high rates. However, these loans have mostly offset the decline in credit by non-residents to public entities.

A deeper analysis into bank loans to non-financial corporations – using micro-level databases available at Banco de Portugal – shows further and equally important characteristics of domestic credit market developments.

Given the sharp economic contraction and the substantial tightening of funding conditions, bank loans to non-financial corporations have gradually decelerated as of mid-2011 and started to post negative growth rates in the last quarter of 2011. A marked downward trend is also noticeable when assessing

**Chart 2.2.5**

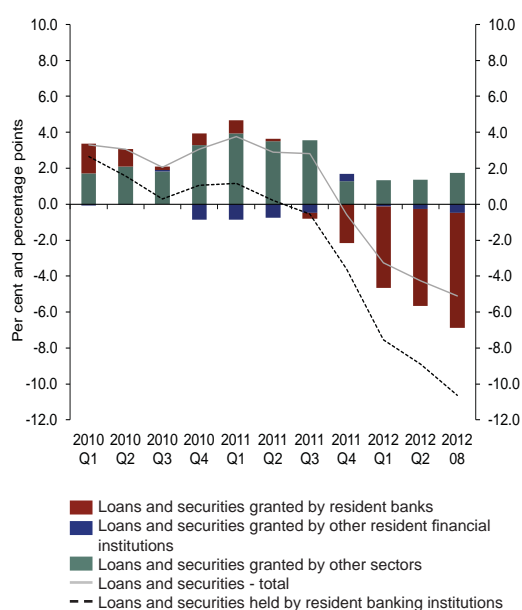
**CHANGES IN TOTAL CREDIT GRANTED TO  
NON-FINANCIAL CORPORATIONS AND  
CONTRIBUTIONS – LARGE ENTERPRISES**



Source: Banco de Portugal.

**Chart 2.2.6**

**VARIAÇÃO DO CONCEDIDO A EMPRESAS  
NÃO FINANCEIRAS E CONTRIBUTOS – MICRO  
EMPRESAS**



Source: Banco de Portugal.

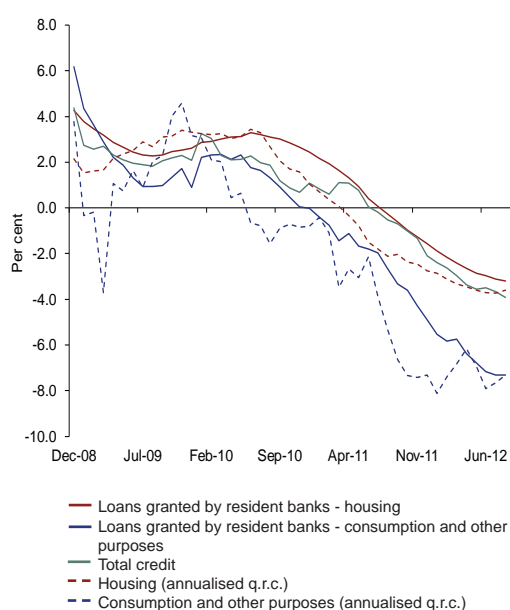
<sup>5</sup> Statistics on total credit by size of enterprise were revised so as to guarantee that all credit is distributed across all classes of enterprises.

the size of the typical company's exposure to banks, which is currently at a level close to that seen at the start of the euro area.<sup>6</sup> There is evidence that the trend of falling rates of change in bank loans is smoothing out (e.g. the annualised quarterly rate of change in loans to non-financial corporations in August stood above the annual rate of change). In the absence of new shocks, these developments would be consistent with a slight recovery in the annual rate of change. In the case of loans to households, there is also some evidence that the slowdown is stabilising, following a very sharp decline (Chart 2.2.7). Moreover, it is also important to note that, unlike 2011, non-domestic resident banks have been reducing their lending activity in Portugal (year-on-year decline by around 10 per cent).

Developments in bank loans to enterprises in Portugal do not differ from those countries most affected by the sovereign debt crisis in the euro area (Chart 2.2.8). Credit dynamics are overall consistent with nominal GDP developments (Chart 2.2.9). However, these findings must be qualified. On the one hand, an assessment of the consistency between bank lending and macroeconomic developments requires a comprehensive analysis of total financing to the corporate sector, including its distribution by several corporate segments. On the other hand, amid the current high uncertainty, Portuguese companies have indeed reduced their demand for credit to fund investment.<sup>7</sup> However, there was also an increase in demand for cash credit and loans for debt restructuring. This demand stemmed from companies

Chart 2.2.7

#### DEVELOPMENTS IN HOUSEHOLD FINANCING | ANNUAL RATES OF CHANGE

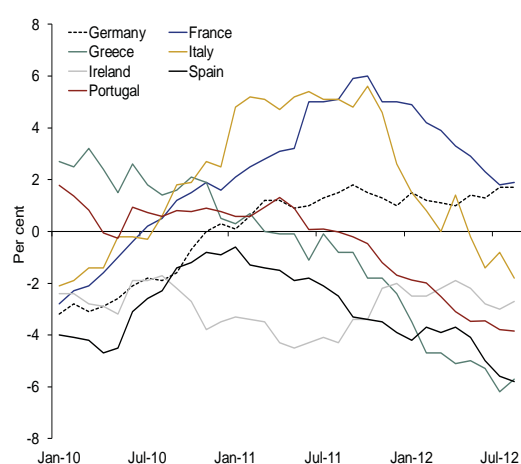


Source: Banco de Portugal.

Note: Latest observation: August 2012.

Chart 2.2.8

#### LOANS GRANTED BY RESIDENT BANKS TO NON-FINANCIAL CORPORATIONS | ANNUAL RATES OF CHANGE



Sources: ECB and Banco de Portugal.

**Notes:** Annual rates of change are calculated on the basis of the relationship between end-month outstanding amounts of loans to residents granted by resident banks, adjusted for securitisation operations and monthly transactions, which are calculated on the basis of outstanding amounts adjusted for reclassifications, write-downs and exchange rate and price revaluations. With regard to Portugal, where applicable, figures are also adjusted for the effects of credit portfolio sales, as well as other sizeable operations with no impact on the actual financing of non-financial corporations. Latest observation: August 2012.

<sup>6</sup> For more details, see Antunes, A. and Martinho, R. (2012), "Access to credit by non-financial firms", Financial Stability Report – May.

<sup>7</sup> These developments are consistent with the latest findings of the Investment Survey, conducted by Statistics Portugal (INE), and the Bank Lending Survey.

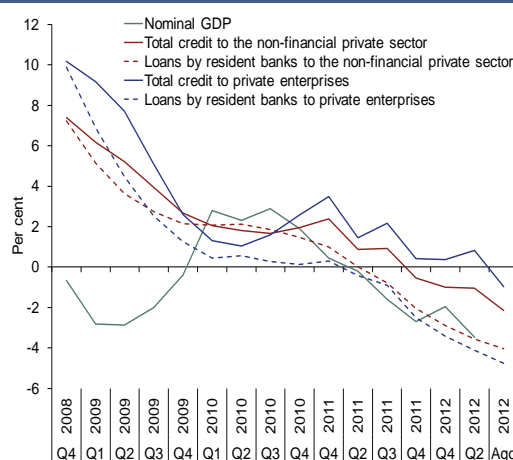


where short-term cash flows were under pressure due to disruptions along the supply chains and/or companies in excessive debt that were put under strain due to negative developments in demand in both current and prospective terms.

Micro evidence brings out a greatly varied picture, as would be expected taking into account the greater perception of risk among banks and the ongoing structural transformation of the Portuguese economy. Overall – and excluding public enterprises – bank loans have declined relatively more in the case of (i) smaller enterprises (Chart 2.2.6), (ii) companies relatively more exposed to developments in domestic demand (particularly non-exporting enterprises), namely in the construction, real estate, trade, manufacturing and consultancy services sectors, (iii) companies with greater credit risk, assessed on the basis of their default levels and Z-score indicators,<sup>8</sup> and (iv) new companies.<sup>9</sup> These dimensions reflect factors on both the supply and demand sides and are, obviously, interlinked. Smaller enterprises have, on average, lower profitability, lower interest coverage ratios, higher default levels, relatively high leverage and lower probability of being exporting enterprises. As regards new companies, the greater perception of risk among banks and the absence of a credit record negatively affects their financing conditions.<sup>10</sup> In any case, evidence available for these companies is a cause for concern, given their importance for job creation and improving the economy's long-run outlook, particularly when they are able to obtain adequate initial funding. Overall, this heterogeneity is qualitatively in line with expectations and consistent with the ongoing restructuring of the economy and a shift in the balance sheets of various institutional sectors.

Chart 2.2.9

DEVELOPMENTS IN ECONOMY FINANCING | ANNUAL RATES OF CHANGE



Sources: ECB and Banco de Portugal.

Note: Latest observation: August 2012.

<sup>8</sup> A company's Z-score, calculated on the basis of its financial ratios in  $t$ , reflects the probability of this company to default its credit liabilities in  $t+1$ . For more details, see "Box 4.4 Z-scores for non-financial firms in Portugal", Financial Stability Report – May.

<sup>9</sup> The definition of new companies corresponds to the set of companies that demand credit for the first time. In many cases, this really corresponds to new companies, while in other cases it corresponds to existing companies that are dealing with the banking system for the first time. For more details, see Antunes, A. and Martinho, R. (2012), "Access to credit by non-financial firms", Banco de Portugal, *Financial Stability Report – May*.

<sup>10</sup> For instance, venture capital is a more adequate source of financing for this type of companies.

## Deleveraging of banks and financing of the economy

In 2011 Portuguese banks undertook a very significant balance sheet adjustment, helped by the sale of assets in the first half of the year, involving debt securities and loans to residents and non-residents, and strong growth in household deposits. This adjustment had a limited impact on credit flows to companies and on the Eurosystem financing of banks, which is particularly relevant taking into account the drop in financing obtained from non-resident credit institutions and the high volume of debt securities that matured and could not be renewed, given that access to medium to long-term wholesale international debt markets remains closed to Portuguese banks.

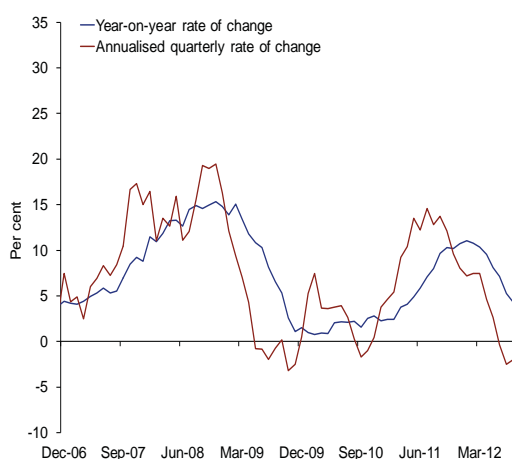
In the course of 2012, banks' balance sheet adjustment continued, although with a different composition. On the one hand, there was a significant increase in own funds, which is fundamental to increase banks' resilience to negative shocks and particularly relevant in the context of a correction of imbalances affecting the economy. On the other hand, household deposits, albeit continuing to grow significantly from the previous year, have slowed down substantially (Chart 2.2.10) and corporate deposits continued on the downward path observed in the previous year.<sup>11</sup>

The deceleration in household deposits was largely expected, given that underlying the strong growth in the previous year were portfolio shifts, which resulted in the replacement of other financial investments (mutual fund shares, life insurance, savings certificates and other government debt securities) with bank deposits. In any case, developments in household deposits in Portugal continued to compare favourably with those seen in other euro area countries (Chart 2.2.11).

However, the slowdown in household deposits has intensified somewhat over the past few months, as shown by their annualised quarter-on-quarter growth rate. Several factors have contributed to these developments. On the one hand, a number of non-financial corporations have issued a substantial volume of bonds – with longer maturities than those of deposits (generally, three years) –, which banks placed

Chart 2.2.10

DEPOSITS FROM RESIDENT HOUSEHOLDS | RATES OF CHANGE

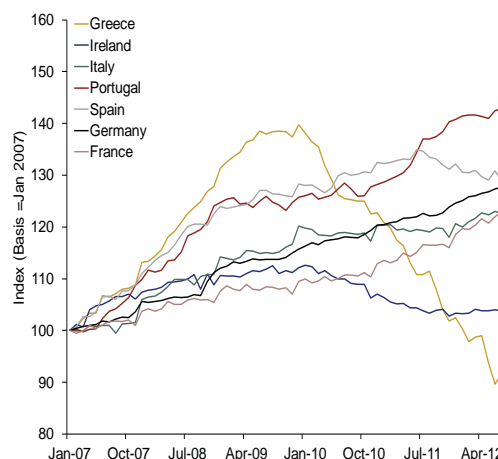


Source: Banco de Portugal.

Notes: The annualised quarterly rate of change is calculated on the basis of seasonally adjusted figures. Latest observation: August 2012.

Chart 2.2.11

DEVELOPMENTS IN HOUSEHOLD DEPOSITS WITH MFI's SINCE 2007



Sources: ECB and Banco de Portugal calculations.

Notes: Includes deposits with an agreed maturity, transferable deposits, deposits redeemable at notice and repurchase agreements. Latest observation: August 2012.

<sup>11</sup> The decline in corporate deposits in 2011 was significantly affected by the abnormally high values recorded in 2010, associated with a foreign direct investment operation by a large enterprise.

with their retail customers. On the other hand, some banks have also resumed own bonds issuance to their customers. Finally, part of the capital increases of banks were also placed with customers. As such, the available evidence continues to point to the maintenance of resident household confidence in the banking system's soundness, which is a very positive factor against the backdrop of an adjustment of the Portuguese economy.

Finally, as mentioned above, in contrast to household deposits, corporate deposits have declined, which may be partly related to their liquidity management, against a background of tighter financing conditions. At the same time, in an environment characterised by great uncertainty and redenomination risks, a number of large non-resident enterprises have diversified their deposit portfolio.<sup>12</sup>

Meanwhile, there continued to be a substantial reduction in banks' external indebtedness, with a high volume of own bonds either maturing or being repurchased, together with a continued fall in financing by non-resident credit institutions. This was partly offset by an increase in Eurosystem financing, similarly to other euro area countries, benefiting from the ECB's non-standard monetary policy measures. This increase in Eurosystem financing was mostly determined by the behaviour of foreign banks resident in Portugal. On the asset side, credit to non-residents continued to drop, with a greater decline in credit to the resident private sector, while financing to the public sector (net of deposits) increased substantially. In contrast to the first half of 2011, the reduction in the stock of credit to the private sector was reflected in the flow of funds to this sector, given that it did not benefit from sales of credit, as a result of international financial market tensions that hampered this type of operation. In fact, the bank deleveraging process will be all the more simple the earlier the market for credit sales resumes normal functioning.

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**12** In statistical terms, there was also a decline in deposits from non-monetary financial institutions of over two years. However, it should be noted that these developments do not constitute an actual drop in deposits, given that this item corresponds only to the accounting counterpart of credit securitisations. In a context of changes regarding securities eligible as collateral for use in Eurosystem's monetary operations, banks have largely unwound credit securitisation operations, which was reflected in a decline in the respective accounting counterpart.

### 3. Fiscal Policy

Following the fifth review of the Economic and Financial Assistance Programme, the general government deficit target for 2012, on a National Accounts basis, was revised from 4.5 to 5.0 per cent of GDP. The target for the 2013 deficit was also revised upwards from 3.0 to 4.5 per cent of GDP. The target for 2014 stands at 2.5 per cent of GDP, below the 3 per cent reference value established in the Stability and Growth Pact (Chart 3.1). According to the joint statement by the European Commission, European Central Bank and International Monetary Fund, the deficit path for 2012 was adjusted to allow the partial operation of automatic fiscal stabilisers, within a context where expenditure is expected to perform better than budgeted, but revenue is lagging significantly behind forecast. According to the 2013 State Budget (SB2013) Report, the new deficit target for 2012 will be met and the debt ratio is forecast to reach 119.1 per cent of GDP at the end of the year.

***In 2012 the fiscal stance is expected to continue to tighten considerably and a very significant structural adjustment is expected***

According to Banco de Portugal estimates, the materialization of the deficit target for 2012 will result in a 3.3 percentage points (p.p.) of GDP change in the structural primary balance excluding special factors (after an adjustment of 3.5 p.p. in 2011). An unprecedented structural fiscal adjustment (close to 6.5 p.p. of GDP) is therefore expected during the first two years of the Programme (see “Box 3.1 *Some considerations on the assessment of the fiscal policy stance*” in this Bulletin). The estimated consolidation effort is obtained by adjusting the actual balance for cyclical effects, which were particularly negative in 2012 (around 2 p.p. of GDP). In addition, underlying this estimate is a correction of the impact of a significant amount of temporary measures which had a positive effect on fiscal developments in 2011 and 2012 (amounting to 4.0 and 1.2 per cent of GDP, respectively), and of a set of special factors that are absent in 2012, but had negative one-off effects on the general government balance in 2011 (with a magnitude of 1.2 per cent of GDP).<sup>1</sup> Lastly, the quantification of the consolidation effort excludes, by definition, the impact of an increase in interest expenditure, which is expected to reach 0.2 p.p. of GDP according to the SB2013 Report. The annual estimate for interest expenditure growth in 2012 stands at 2.3 per cent, which is underpinned by a marked deceleration *vis-à-vis* the first half of the year (13.0 per cent). In spite of an increase in the stock of public debt throughout 2012, growth in this expenditure item is expected to be mitigated by the recent issuance of Treasury Bills at more favourable rates in the primary market (Chart 3.2) and by the cost of the Programme’s funding, particularly after the elimination of the margins associated with the instalments from the European Financial Stabilisation Mechanism and the European Financial Stability Facility. In fact, the Portuguese Treasury and Debt Management Agency (IGCP) estimates that the cost of loans received up to September 2012 under the Programme stands at 3.6 per cent,<sup>2</sup> below the average interest rate on the public debt in 2011 (4.0 per cent).<sup>3</sup>

***In terms of composition, the structural adjustment in 2012 will chiefly result from a decrease in primary expenditure, although this effect will be partly reversed next year***

The expected fiscal consolidation for 2012 results mainly from the estimated decrease in primary expenditure and, to a lesser extent, from developments in structural revenue. In 2012 structural revenue is expected to record a change below that of 2011. In fact, although the State Budget for 2012 included a number

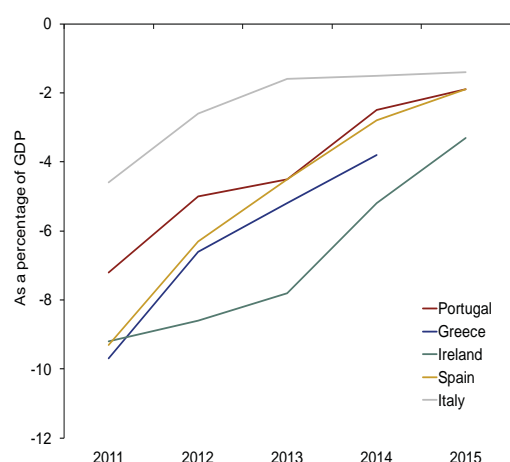
<sup>1</sup> For further details on temporary measures and special factors in 2011 and 2012, see “Box 3.1 *Some considerations on the assessment of the fiscal policy stance*” in this Bulletin.

<sup>2</sup> See [http://www.igcp.pt/fotos/editor2/2012/Boletim\\_Mensal/10\\_BolMensal.pdf](http://www.igcp.pt/fotos/editor2/2012/Boletim_Mensal/10_BolMensal.pdf).

<sup>3</sup> The average interest rate on the public debt is calculated in nominal terms as the ratio between interest expenditure in a given year and the average stock of debt at the end of the same and the preceding years.

Chart 3.1

FISCAL BALANCE TARGETS | AS A PERCENTAGE OF GDP

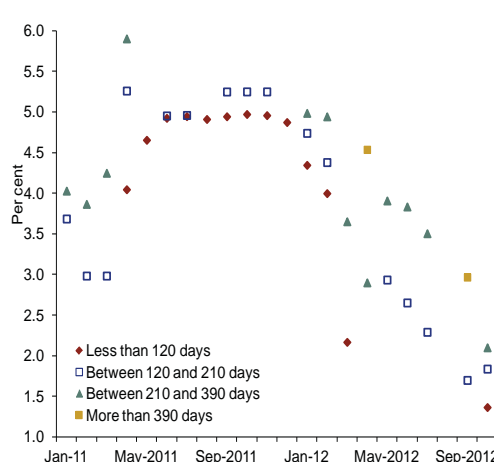


**Sources:** Portugal - Report on the fifth review of the Programme; Greece - State Budget for 2013 ; Ireland - Report on the seventh review of the Programme; Spain - State Budget for 2013; Italy - 2012 Update of the Economic and Financial Document.

**Note:** For Portugal, the 2011 figure is adjusted for the effects of temporary measures and special factors according to Banco de Portugal estimates. 2011 figures for the remaining countries exclude temporary measures according to European Commission estimates from the 2012 Autumn Economic Forecasts.

Chart 3.2

INTEREST RATE ON TREASURY BILLS | PER CENT



**Source:** I/GCP.

of tax policy measures with a very significant expected impact on revenue (stemming mostly from VAT, but also from personal and corporate income taxes), the outcome throughout the year suggests that this impact will be partly offset by non-linear cyclical effects and/or non-discretionary effects, which may include tax fraud and evasion. In addition, there seems to have been some overestimation of the impact of the measures when they were designed, in particular regarding indirect taxes. Although saving measures affected most structural primary expenditure items, its decrease is mainly due to the impact on compensation of employees and social benefits in cash of the suspension of summer and Christmas bonuses to public sector employees and pensioners. This measure – whose net effect<sup>4</sup> accounts for approximately 1.3 p.p. of the structural adjustment in 2012 – is expected to be partly reversed in 2013, after being ruled as unconstitutional by the Constitutional Court.

### ***The fiscal deficit in the first half of the year still stood at a high level***

According to the Quarterly National Accounts published by *INE* at the end of September (Table 3.1), the general government deficit stood at 6.8 per cent of GDP in the first half of 2012 (8.2 per cent in the same period of 2011).

In the first semester of 2012, tax revenue decreased by 4.6 per cent, compared with the same period of the previous year. These developments are mainly explained by revenue from taxes on production and

<sup>4</sup> The net effect of the partial suspension of the summer and Christmas bonuses to public sector employees and pensioners estimated by Banco de Portugal refers to the negative impact on primary expenditure net of the resulting decrease in the collection of taxes on income and wealth and social contributions.

Table 3.1

GENERAL GOVERNMENT ACCOUNTS: EXECUTION IN THE FIRST HALF OF THE YEAR AND FORECAST FOR THE YEAR AS A WHOLE   AS A PERCENTAGE OF GDP						
	2011		2012		Year-on-year rate of change (%)	
	First semester	Year	First semester	Year <sup>(a)</sup>	First semester	Year <sup>(a)</sup>
<b>Total revenue</b>	<b>38.3</b>	<b>45.0</b>	<b>38.4</b>	<b>40.6</b>	<b>-2.7</b>	<b>-12.2</b>
Current revenue	37.6	40.5	37.4	39.3	-3.5	-5.7
Tax revenue	33.2	35.9	32.6	34.9	-4.6	-5.4
Taxes on income and wealth	7.9	9.9	8.1	9.3	-0.7	-8.4
Taxes on production and imports	13.3	13.7	13.0	13.9	-5.1	-1.5
Social contributions	12.0	12.2	11.5	11.7	-6.7	-7.4
Other current revenue	4.3	4.7	4.7	4.4	5.5	-8.0
Capital revenue	0.7	4.4	1.0	1.3	38.5	-71.7
<b>Total expenditure</b>	<b>46.5</b>	<b>49.4</b>	<b>45.2</b>	<b>45.6</b>	<b>-5.6</b>	<b>-10.2</b>
Current expenditure	43.1	45.4	43.0	43.8	-3.0	-6.2
Current transfers	23.6	25.3	24.5	24.9	1.1	-4.5
to households	20.3	22.0	21.4	22.2	2.7	-2.1
to enterprises	0.6	0.7	0.5	0.8	-19.8	10.6
other	2.7	2.6	2.6	1.9	-6.0	-29.7
Interest	3.7	4.0	4.3	4.2	13.0	2.3
Compensation of employees	11.6	11.4	10.0	10.0	-16.4	-14.2
Intermediate consumption	4.2	4.7	4.2	4.7	-2.8	-3.3
Capital expenditure	3.4	4.0	2.2	1.8	-38.8	-55.3
Gross fixed capital formation	2.4	2.6	1.8	2.0	-27.8	-23.3
Other capital expenditure	1.1	1.4	0.4	-0.2	-63.8	-114.3
<b>Overall balance (EDP)</b>	<b>-8.2</b>	<b>-4.4</b>	<b>-6.8</b>	<b>-5.0</b>		

Sources: INE and Ministry of Finance.

Note: (a) 2013 State Budget Report.

imports and social contributions. Receipts from taxes on income and wealth benefited from the impact of revenue from the extraordinary personal income tax surcharge on the 2011 Christmas bonus, as well as from a delay in the payment of refunds, *vis-à-vis* the previous year pattern. Still on the revenue side, capital revenue grew markedly in the first half of the year, almost entirely as a result of both the collection of capital taxes under the third Exceptional Regime of Tax Settlement and the transfer of the Banco Português de Negócios pension fund.

In turn, general government primary current expenditure declined by 4.5 per cent in the first half of 2012, compared with the same period of 2011. The decrease in primary current expenditure is mainly explained by a decline in compensation of employees, resulting from the suspension of summer bonuses of public sector employees and a reduction in the number of general government employees. By contrast, expenditure on social benefits increased in the first half of the year,<sup>5</sup> largely as a consequence of a rise in

<sup>5</sup> A marked deceleration is expected in the second half of the year as a result of the impact of the suspension of the summer and Christmas bonuses to pensioners.

expenditure on unemployment benefits and old-age pensions, the latter mostly reflecting the amounts spent on pensions of the banking sector substitutive scheme. Interest expenditure increased by 13.0 per cent, on a year-on-year basis, in the first half of the year, while capital expenditure decreased very markedly in the same period.<sup>6</sup>

The budget execution of the first half of the year shows uncertainties and risks regarding the achievement of the general government deficit target for 2012. In fact, given the atypical developments in tax revenue throughout 2012, some uncertainty remains about the evolution of revenue from the main taxes up to the end of the year. On the expenditure side, the official estimate for expenditure on social benefits requires its deceleration in the second half of the year, particularly as regards spending on social benefits in kind in the health sector. The risks to the budget outturn in the second half of 2012 affect both the fiscal outcomes of the current year and the achievement of the general government deficit target for 2013 (see “Box 3.2 *Fiscal outlook for 2013*” in this Bulletin).

### ***The consolidation effort foreseen for 2013 relies mostly on measures on the revenue side***

Within the scope of a continued strategy to correct the fiscal imbalance, the SB2013 Report includes a number of measures to decrease public expenditure. However, the consolidation effort – as presented in the Report – focuses mainly on the revenue side, encompassing several legal tax changes. In particular, in 2013 the tax burden will increase very markedly, mostly for households and, to a lesser extent, corporations. The effects of the tax burden increase over the past years are visible in a deterioration both in household disposable income and permanent income expectations, which impact on private consumption developments and firms’ demand prospects (see “Section 4 *The adjustment of the Portuguese economy*” in this Bulletin). Uncertainty regarding the future tax framework also contributes to a postponement of consumption and investment decisions. These effects – and potential distortions in the economy stemming from an excessive increase in the tax burden – should not be neglected and pose an additional risk to the success of the adjustment process of the Portuguese economy. On the expenditure side, following the Programme’s fifth review, the Government committed to carry out a detailed analysis to identify potential savings to reach the medium-term fiscal targets. In fact, a consolidation effort of around 2¼ per cent of GDP will be required to reach a structural deficit below 0.5 per cent of GDP in 2015. This consolidation effort is expected to result mainly from a decrease in expenditure, to be specified by mid-February 2013. This fiscal consolidation strategy requires priorities to be established and must be achieved without across-the-board expenditure cuts and by promoting an efficient use of resources.

<sup>6</sup> Developments in capital expenditure in the first half of 2012 (-38.8 per cent) are influenced by a base effect stemming from the recording in the same period of 2011 of the total stock of debt guaranteed by the Regional Government of Madeira to *SESARAM* and from the assumption of the impairments of the regional enterprise *Via Madeira*. Adjusting for these effects, the decrease in capital expenditure in the first half of 2012 is expected to have stood at 23.8 per cent.

### BOX 3.1 | SOME CONSIDERATIONS ON THE ASSESSMENT OF THE FISCAL POLICY STANCE

The analysis of fiscal developments cannot be solely based on the headline balance as a percentage of GDP. Indeed, this indicator is rather relevant for the fulfilment of commitments within the scope of the European fiscal supervision mechanism and, in the current case of Portugal, of the objectives set out in the Economic and Financial Assistance Programme. However, it is affected by several discretionary and non-discretionary effects, particularly of a cyclical nature, which must be differentiated in order to assess the fiscal policy stance.

Firstly, the fiscal balance is affected by the cyclical position of the economy and, as such, a correct analysis of the fiscal policy stance will necessarily entail the exclusion of that effect. Cyclical adjustment methodologies that are currently used by international institutions fall within the “aggregated” approach, where the cyclical component of the fiscal balance is based on the output gap (e.g. that used by the European Commission and the IMF), or the “disaggregated” approach, which takes into account gaps in economic variables that are much closer to the actual bases of fiscal items affected by cyclical conditions<sup>1</sup> and, as such, consider the effects of the composition of the economic activity (e.g. that adopted by the Eurosystem). In addition to this general characteristic, methodologies also differ as regards specific details in their implementation. It should be noted that all methodologies have a common limitation given that the calculation of gaps relies on the identification of trends that, despite the various methods used, are based not only on past data but also on forecasts. Therefore, even when no revisions have been made to past data, the mere change in macroeconomic prospects has implications over the calculation of the cyclical component and, consequently, the assessment of the fiscal consolidation effort.

Banco de Portugal uses the Eurosystem methodology<sup>2</sup> and, on the basis of its estimates for relevant fiscal variables and the macroeconomic scenario, it foresees that changes in the cyclical position of the economy will provide a marked negative contribution (around 2 p.p. of GDP) to fiscal outcomes in 2012 (Table 1). Given that, in 2012, developments in the macroeconomic bases used in the Eurosystem methodology (the most relevant ones being private consumption and the private sector wage bill) *vis-à-vis* the corresponding trends was less favourable than GDP developments in relation to its own trend, this change in the cyclical component should be more negative than that obtained using the “aggregated” approach.

Secondly, also noteworthy is the effect of temporary measures on the deficit in each specific year. Banco de Portugal uses the definition adopted by the Eurosystem, according to which temporary measures are transactions linked to discretionary measures or other non-recurring factors that affect, in general positively, the general government balance in one direction over a limited period of time (three years, at most). This definition only includes factors with a negative impact on the fiscal balance that are beyond the control of fiscal policy-makers. Based on the available information, underlying the compliance with the official target for the deficit in 2012 should be temporary measures that amount, as a whole, to

<sup>1</sup> Typically, revenue from taxes and social contributions and unemployment benefits' expenditure.

<sup>2</sup> For more details, see Braz, C. (2006), “The calculation of cyclically adjusted balances at Banco de Portugal: An update”, Banco de Portugal, *Economic Bulletin – Winter*.



Table 1

**ASSESSMENT OF THE CONSOLIDATION EFFORT: A DETAILED ANALYSIS FOR THE 2008-2012 PERIOD | As A PERCENTAGE OF GDP**

	2008	2009	2010	2011	2012
Overall balance <sup>(a)</sup>	-3.6	-10.2	-9.8	-4.4	-5.0
Temporary measures <sup>(b)</sup>	1.1	-	1.7	4.0	1.2
Special factors <sup>(c)</sup>	-	-	-2.9	-1.2	-
Overall balance excluding temporary measures and special factors	-4.7	-10.2	-8.7	-7.2	-6.2
Interest payments <sup>(d)</sup>	3.0	2.8	2.9	4.0	4.2
Primary balance excluding temporary measures and special factors	-1.7	-7.3	-5.8	-3.2	-2.0
Cyclical component of the balance <sup>(e)</sup>	1.4	0.8	1.7	0.7	-1.4
Cyclical component of revenue	1.3	0.8	1.7	0.7	-1.3
Cyclical component of expenditure	-0.2	0.0	0.0	-0.1	0.1
Primary balance excluding temporary measures, special factors and the cyclical component	-3.1	-8.2	-7.5	-3.9	-0.6
Change	-1.8	-5.0	0.7	3.5	3.3

**Sources:** INE, Ministry of Finance and Banco de Portugal.

**Notes:** (a) The value for 2012 corresponds to the official target. (b) According to the definition adopted by the Eurosystem. (c) Special factors are transactions that temporarily deteriorate the general government deficit but, according to the Eurosystem definition, cannot be treated as temporary measures. (d) The value for 2012 corresponds to that included in the 2013 State Budget Report. (e) The cyclical component is calculated by Banco de Portugal according to the methodology used by the Eurosystem.

1.2 per cent of GDP<sup>3</sup> (4.0 per cent of GDP in 2011).<sup>4</sup> It should be highlighted that there are transactions that temporarily deteriorate the general government deficit but, according to the Eurosystem definition, cannot be treated as temporary measures. These operations, referred as special factors, amounted to 1.2 per cent of GDP in 2011,<sup>5</sup> but seem negligible in the current estimate for the deficit in 2012. If the deficit target for 2012 is met (5.0 per cent of GDP), the deficit excluding temporary measures and special factors is likely to drop from 7.2 per cent of GDP in 2011 to 6.2 per cent of GDP in 2012.

Finally, interest payments are usually excluded from the assessment of the fiscal policy stance, given that they mostly reflect outlays related with the public debt stock that has accumulated over the years. The primary balance is the fiscal indicator that excludes this type of expenditure.

In sum, the consolidation effort, measured by the change in the cyclically adjusted primary balance excluding temporary measures and special factors, is likely to reach 3.3 p.p. of GDP in 2012 (after 3.5

**3** In 2012, the temporary measures considered are the following: (i) the personal income tax collection regarding the remaining effect of extraordinary surcharge applied to Christmas bonuses in 2011; (ii) the capital revenue from the transfer to the general government sector of the pension fund of *Banco Português de Negócios*; (iii) the extraordinary collection of capital taxes within the scope of the third exceptional tax regularisation scheme for capital held abroad; (iv) the proceeds from the auction of fourth-generation mobile phone licenses; (v) revenue from the concession of the public airport service. The recording of the latter with an impact on the deficit in National Accounts depends on a final decision by the statistical authorities.

**4** The temporary measures affecting the 2011 budget balance are the following: the revenue resulting from the transfer to Social Security of the assets associated with the pension funds of a set of financial institutions (as a counterpart for the assumption of the liabilities from old-age and survival pensions of banking employees under the respective regime) and the receipts from a personal income tax surcharge on part of the 2011 Christmas bonus in excess of the national minimum wage.

**5** The special factors considered in 2011 are the following: the reclassification in the general government account of the investment carried out in *Via do Infante* in the context of a public-private partnership; the capital transfer associated with the recapitalisation of *Banco Português de Negócios*; the recording of the SESARAM stock of debt guaranteed by the Madeira Regional Government; the assumption of a regional enterprise (*Via Madeira*) impairments; the recording of Madeira Regional Government debt to football clubs and in the context of contracts with entities of the health sector and the recording in the non-financial accounts of transactions of the fund to support payments of the National Health Service.

p.p. of GDP in 2011). This estimate assumes: (i) the achievement of the deficit target for 2012; (ii) a situation where recourse to temporary measures reaches the identified amount; (iii) the absence of special factors; (iv) the materialisation of the estimate for interest payments included in the 2013 State Budget Report; and (v) the materialisation of the macroeconomic scenario underlying the most recent Banco de Portugal projections.

## BOX 3.2 | FISCAL OUTLOOK FOR 2013

Following the fifth review of the Economic and Financial Assistance Programme to Portugal, the target for the general government deficit in 2013 was revised and set at 4.5 per cent of GDP (3.0 per cent of GDP in the initial Memorandum of Understanding). The State Budget for 2013 (OE2013) sets out a series of consolidation measures equivalent to 3.2 per cent of GDP which are deemed necessary for compliance with this target. According to the OE2013 Report, the ratio of total revenue to GDP is expected to increase by 1.7 p.p., while total expenditure should rise by 1.2 p.p. of GDP (Table 1).

According to the Ministry of Finance, the overall magnitude of consolidation measures forecast for 2013 with an impact on the revenue side amounts to 2.6 per cent of GDP and chiefly results from legislative changes regarding the personal income tax. In fact, in 2013, the number of personal income tax brackets will be reduced, which will lead to a considerable rise in this tax's average rates. In addition, a 4 per cent surcharge will be introduced, applicable to the portion of taxable income exceeding the national minimum wage. Also, final withholding tax rates will worsen and tax rebates associated with tax and personal benefits will be reduced. As regards the corporate income tax, the main measure relates to a reduction of tax benefits, which will be reflected in the 2013 revenue through an increase in the prepayments' rates. With regard to the municipal real estate tax, no changes are proposed in the legislation, although a non-negligible increase in this tax's revenue is expected as a result of the real estate revaluation process that took place in the course of 2012. In addition, a new rate will be introduced as regards stamp duties on high-value properties (EUR 1 million and over), which will supplement the applicable municipal real estate tax rate. Revenue from social contributions will increase as a result of the broadening of the base of contribution to CGA, as well as the charging of a levy on unemployment and sickness allowances. This set of measures is underpinning the 2.1 p.p. of GDP increase projected by the Ministry of Finance for tax revenue.

The SB2013 Report estimates that measures aimed at reducing public expenditure will have an impact of 0.6 per cent of GDP. The most important measures focus on social benefits (both in cash and in kind) and compensation of employees (through rationalisation of costs and a cut in the number of public employees). Still, these items are likely to record a positive change in 2013, largely as a result of a partial reversal of the suspension of holiday and Christmas bonuses. In turn, additional savings are expected as regards expenditure on intermediate consumption and public investment.

Table 1

### GENERAL GOVERNMENT ACCOUNTS: MAIN ITEMS | AS A PERCENTAGE OF GDP

	2011	2012	2013	Change 2013-2012
<b>Total revenue</b>	<b>45.0</b>	<b>40.6</b>	<b>42.3</b>	<b>1.7</b>
<i>of which:</i>				
Tax revenue	35.9	34.9	37.0	2.1
Capital revenue	4.4	1.3	0.6	-0.7
<b>Total expenditure</b>	<b>49.4</b>	<b>45.6</b>	<b>46.8</b>	<b>1.2</b>
<i>of which:</i>				
Social benefits	22.0	22.2	22.6	0.4
Compensation of employees	11.4	10.0	10.4	0.4
Intermediate consumption	4.7	4.7	4.5	-0.2
Interest	4.0	4.2	4.3	0.1
Public investment	2.6	2.0	1.8	-0.2
<b>Overall balance</b>	<b>-4.4</b>	<b>-5.0</b>	<b>-4.5</b>	<b>0.5</b>
Structural overall balance	-6.2	-4.0	-2.4	1.6

Source: Ministry of Finance.

According to the SB2013 Report, the debt ratio is expected to reach 123.7 per cent of GDP at the end of 2013, increasing by 4.6 p.p. from the value estimated for the end of 2012. Underlying this estimate are deficit-debt adjustments of a magnitude equal to 0.4 per cent of GDP.

It should be mentioned that the estimates for developments in public finances in 2013 presented in the SB2013 Report are subject to a high level of uncertainty and a number of risks. In fact, it is particularly difficult to predict the response of households to the sizeable amount of measures impacting on their disposable income. This intensifies the uncertainty surrounding the macroeconomic scenario. In addition, as was the case with the State Budget for 2012, the consolidation strategy for 2013 is quite focused on a particular tax. Although personal income tax revenue is typically easier to project than VAT revenue (which was the basis of the 2012 strategy on the revenue side), the risk inherent in the quantification of the impact of measures should not be neglected. Finally, the forecasted fall in spending on items that have been declining since the start of the Programme also poses some risks to the implementation of the State Budget for 2013.

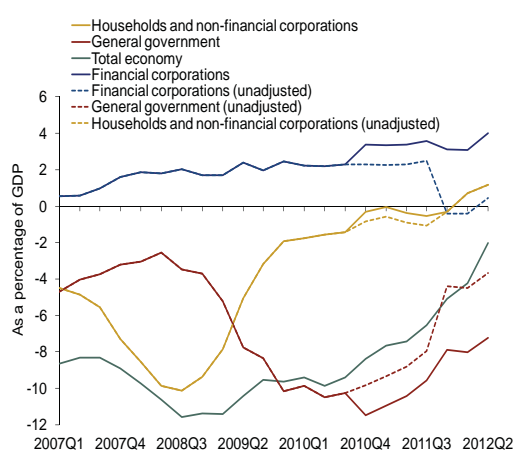
#### 4. The Adjustment of the Portuguese Economy

The adjustment of the Portuguese economy continued into 2012, reflecting not only the need for adjustment to the high-indebtedness and low productivity situation, but also the impact of the public sector adjustment and the high uncertainty due to the slowdown in the international economy. The non-tradable sector, especially construction, has contracted significantly, whereas the exporting sector has registered unprecedented gains in market share. Households and non-financial corporations have gradually adjusted their balance-sheets in line with the high leverage levels, and, as a whole, the two sectors currently display financing capacity (Chart 4.1).

Combined with the restrictive and pro-cyclical stance of fiscal policy, these dynamics have implied a substantial adjustment of the current and capital account, which will post surpluses in the second half of the year (Chart 4.2). This adjustment – reflecting cyclical and structural elements – has translated noticeably into the labour market, with the unemployment rate reaching historical peaks. The rise in structural unemployment, strengthened by the postponement of the start of the investment cycle, necessary to create new types of wealth, indicates that creative destruction processes, which are determinants of long term economic growth, still face obstacles. The pursuit of a wide agenda of structural reforms, as defined in the economic and financial assistance programme, is a necessary condition to reduce distortions that hamper the reallocation of productive factors towards the most dynamic and competitive sectors, leading to a decline in structural unemployment and an increase in potential output growth.

Chart 4.1

**FINANCING NEEDS PER INSTITUTIONAL SECTOR | YEAR FINISHED IN EACH QUARTER**



**Source:** INE (Quarterly national accounts per institutional sector).

**Note:** Figures are adjusted for the transfer of funds from the pension funds of Portugal Telecom (4th quarter of 2010) and banks (4th quarter of 2011) to the general government.

Chart 4.2

**CURRENT AND CAPITAL ACCOUNT BALANCE | AS A PERCENTAGE OF GDP**



**Source:** Banco de Portugal.

## 4.1. Economic activity and labour market

### *The adjustment process had a negative impact on developments in economic activity and employment*

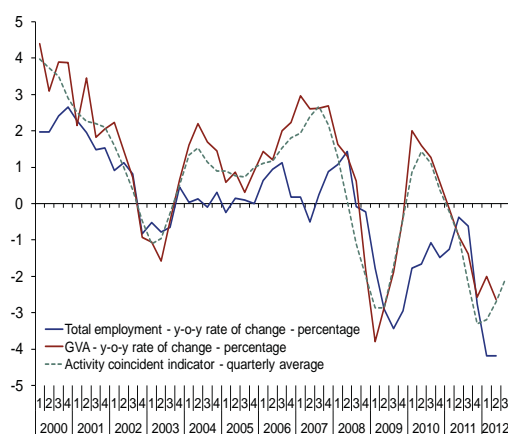
In the first half of 2012, GVA of the Portuguese economy declined by 2.3 per cent in year-on-year terms, compared with -0.5 and -2.0 per cent rates of change in the first and second halves of 2011, respectively (Chart 4.1.1). In turn, Banco de Portugal's coincident indicator of economic activity recovered moderately in the first half of 2012, which extended to the third quarter of the year, after the very sharp fall in 2011.

GVA dynamics in the Portuguese economy in 2012 reflects favourable developments in the main sectors, in the context of the adjustment programme. On the one hand, in the first half of 2012, the 'Industry' and 'Services' sectors had year-on-year decreases of 2.7 and 1.4 per cent respectively (Chart 4.1.2). On the other hand, activity in 'Construction' declined by 13.8 per cent, after a fall of 12.2 per cent in 2011. These developments are naturally due to the reduction in the volume of public investment and the fall in demand for new housing by households, in a context of lower expectations as to future income developments. The expected deterioration in taxes on real-estate may have also contributed to contracting demand. Nevertheless, the strong developments in the new housing market are also due to the dynamics observed over the 1990s. Investment in new housing and requalification grew by 45 per cent in real terms in the 1993-2000 period, and contracted by around 50 per cent in the 2000-2011 period.

The recent performance of GVA in 'Industry' is consistent with developments in different components of

**Chart 4.1.1**

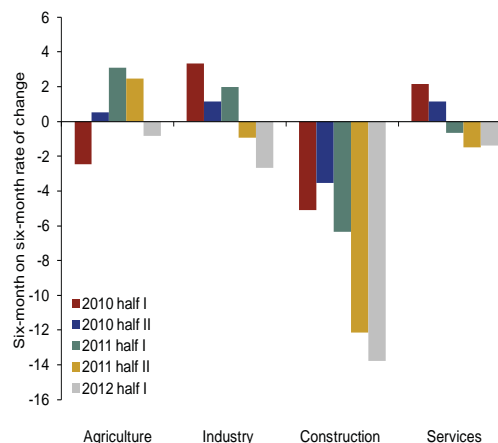
**TOTAL EMPLOYMENT, GVA AND ACTIVITY COINCIDENT INDICATOR | REAL RATE OF CHANGE, PER CENT**



**Sources:** INE (Employment survey) and Banco do Portugal.

**Chart 4.1.2**

**SECTORAL GVA | SIX-MONTH ON SIX-MONTH RATE OF CHANGE, PER CENT**



**Source:** INE (Quarterly national accounts).

**Note:** Agriculture includes GVA in Agriculture, Animal production, Hunting, Forestry and Fishing; Industry includes GVA in Mining and quarrying and Manufacturing; Construction includes GVA in Construction branches; and Services includes GVA in Wholesale and Retail trade; Repair of motor vehicles and motorcycles and Accommodation and food service activities; Transportation and storage and Information and communication activities; Financial and insurance activities and Real estate activities and Services provided to Corporations, General government, Education and Health and Other services.

aggregate demand. In effect, the favourable behaviour of exports was not enough to sustain industrial activity due to the fall in domestic demand. The growth rates of Industry turnover in the domestic and external markets have shown a downward trend since 2010, albeit less sharp in the latter case (Chart 4.1.3). Recent negative activity developments in the 'Services' sector are also related to the fall in private consumption, particularly in the 'Wholesale and Retail trade, Repair of motor vehicles and motorcycles and Accommodation and food service activities' sub-sectors.

### ***Labour market conditions have deteriorated markedly***

The labour market, similarly to economic activity, deteriorated significantly in the last decade. In most recent years, this deterioration has translated into a strong fall in employment, a structural rise in the unemployment rate and a decline in the labour force. Concomitantly, employment rotation was high, especially in temporary work, but it has become more widespread in all labour market segments, through a significant reduction in long-term employment. This rotation has enabled a wage flexibility level that is ensured by the importance of new labour contracts in total employment. Wages in these contracts respond more to the economic cycle than in other employments.

In the context of the trends marking labour market developments, employment declined sharply in the first half of 2012, translating into a year-on-year rate of change of -4.2 per cent. This fall was more marked than in economic activity, with an increase in apparent labour productivity. Headcount employment in 2012 stands at the same level observed in 1997. This fall in the employment level was concentrated in the period after 2008 and was characterised, at firm level, by a strong fall in the job creation rate and, to a lesser extent, by an increase in the job destruction rate. In sectoral terms, employment developments are related to the structural transformation process of the Portuguese economy. In effect, the fall in employment in the 'Construction', 'Industry', and 'Agriculture' sectors was already visible at the start of participation in the euro area, and accelerated after 2008 (Chart 4.1.4). In turn, employment in the 'Services' sector grew up to 2008, but declined subsequently.

This phenomenon of rising unemployment is not new in the Portuguese economy, although it has been more marked in recent years. Structural unemployment growth over the last decade is due to the malfunctioning of Portuguese labour market institutions and the low level of human capital in the labour force. Based on most recent estimations, the natural unemployment rate increased from 6.4 per cent in 2000 to 11.5 per cent in 2012. The number of unemployed persons in the Portuguese economy increased significantly in the first half of 2012 (20.7 per cent), and accelerated between the first two quarters of the year (Chart 4.1.5). The dynamics of job creation and destruction have also contributed to the rise in the unemployment rate, which attained 15 per cent in the first half of 2012 (12.7 per cent in 2011).

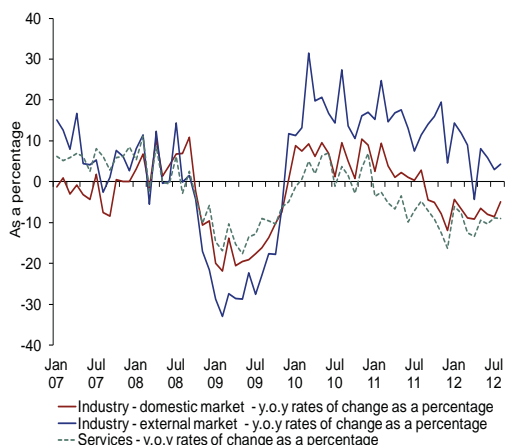
### ***Recent dynamics of flows between the different states of the labour market***

Developments in employment and unemployment are the result of the dynamics of flows between the different states of the Portuguese labour market. Chart 4.1.6 presents the quarterly average flows between labour market situations – inactivity, employment and unemployment. The figures correspond to quarterly averages for the third and fourth quarters of 2011 and the first and second quarters of 2012. The flow of individuals leaving employment is higher than the flow of those entering employment, which corresponds, in net terms, to a loss of 19.1 thousand employments each quarter. The flow into unemployment is higher than the flow out of unemployment, which is equivalent to a net increase of 27.2 thousand new unemployed persons each quarter.

Long-term unemployment as a percentage of total unemployment currently exceeds 50 per cent. This indicator tends to drop slightly when flows of new unemployment increase significantly. In turn, subsi-

Chart 4.1.3

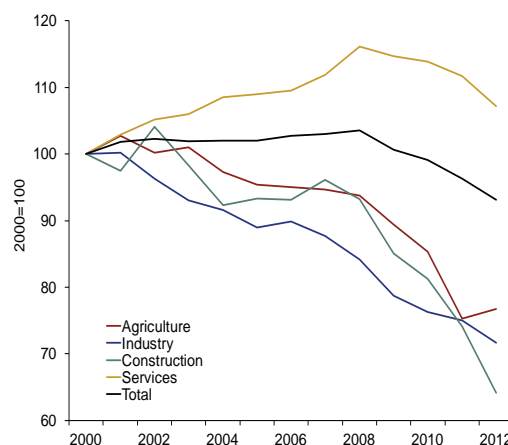
**TURNOVER INDEX FOR INDUSTRY (DOMESTIC AND EXTERNAL MARKETS) AND SERVICES**  
| YEAR-ON-YEAR RATE OF CHANGE, PER CENT



Source: INE.

Chart 4.1.4

**SECTORAL EMPLOYMENT DEVELOPMENTS**  
2000=100



Source: INE (Employment Survey).

Notes: Break in the series in the first quarter of 2011. The figures for 2012 are calculated from average employment in the first two quarters of the year.

dised unemployment stands at around 30 per cent, and has been affected by the percentage of new unemployed receiving unemployment benefits and by the end of the eligibility period for long-term unemployed persons.

The strong declines in employment have put a constraint on labour supply developments. In recent years, the labour force declined for the first time in Portugal since the 1980s, i.e., many workers who lost their jobs have moved directly to inactivity or have even left the country. This contraction of the labour force, in particular when affecting higher-qualified workers, may pose risks to the growth capacity of the Portuguese economy in the medium term.

### **High employment rotation and strong labour market segmentation**

Employment rotation in Portugal is high, but also much segmented.<sup>1</sup> However, this has extended to several segments of the Portuguese population that previously had high rates of employment retention. The percentage of workers aged over 45 years of age in the same job for more than 20 years is a usual indicator of long-term employment. This number declined from around 38 per cent in the early 1990s to less than 24 per cent in recent years. At the same time, the percentage of workers in the same age bracket employed for less than one year rose from 10 per cent to around 22 per cent. These developments are not exclusively typical of the Portuguese market, but do have here a more marked pattern than in other economies.<sup>2</sup> The effect of labour market reforms will tend to restrain job creation in the short term. It is to be expected that, in the medium term, positive effects prevail in labour

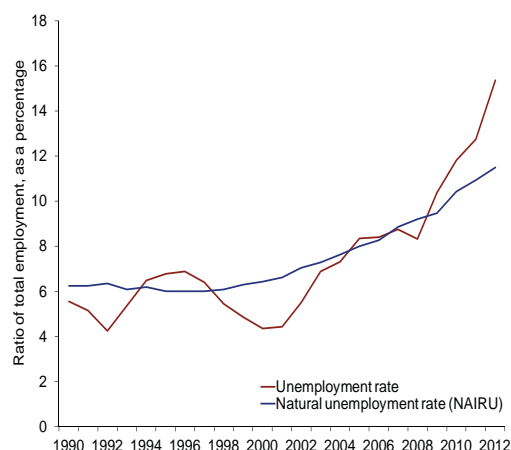
<sup>1</sup> See Centeno, M. and Novo, A. (2008), 'The anatomy of employment growth in Portuguese firms', Banco de Portugal, Economic Bulletin - Summer).

<sup>2</sup> See Farber, H. (2008), 'Employment Insecurity: The Decline in Worker-Firm Attachment in the United States', Working Papers, Princeton University, Industrial Relations Section; n°530).



Chart 4.1.5

UNEMPLOYMENT RATE AND NATURAL  
UNEMPLOYMENT RATE | PER CENT



Sources: INE (Inquérito ao Emprego) and Banco do Portugal.

Note: For details on the methodology to compute the natural unemployment rate see, Economics and Research Department, The Portuguese Economy in the Context of the Economic, Financial and Monetary Integration, Banco de Portugal, chapter 4.

Chart 4.1.6

QUARTERLY AVERAGE FLOWS IN THE LABOUR  
MARKET | VOLUME IN THOUSANDS AND, IN BRACKETS,  
PERCENTAGE OF THE LABOUR FORCE <sup>(A)</sup>



Sources: INE and Banco de Portugal.

Note: (a) Considering the common component of the sample of quarter t and quarter t-1, and using the population weights of quarter t. Average values relate to the last two quarters of 2011 and the first two quarters of 2012.

demand and supply.<sup>3</sup>

## 4.2. Demand

Current projections point to a further decrease in Portuguese economic activity in 2012, after a contraction in 2011. GDP is expected to drop by 3.0 per cent in 2012, after decreasing by 1.7 per cent in the previous year, as a result of a very negative contribution of domestic demand (-7.0 p.p.) and a significant positive contribution of exports (Table 4.2.1 and Chart 4.2.1).

Comparing the current projection with the average value of the projection range for euro area GDP growth published in the September 2012 issue of the ECB's Monthly Bulletin, the negative differential between GDP growth rates in Portugal and the euro area is expected to be only slightly below that of the previous year (Chart 4.2.2), *i.e.*, a process of real divergence from the EU average per capita income levels continues to be observed.

### *Drop in private consumption and investment, amid increased uncertainty and deteriorating income prospects and demand*

Private consumption experienced significant cumulative growth following the nominal convergence process of the Portuguese economy and – in the context of the participation in the euro area – amid

<sup>3</sup> Examples of reforms that limit the creation of employment in the short-run are the increase in the number of working days and normal working hours.

Table 4.2.1

## PORTUGAL – GDP AND MAIN EXPENDITURE COMPONENTS | RATES OF CHANGE, PER CENT

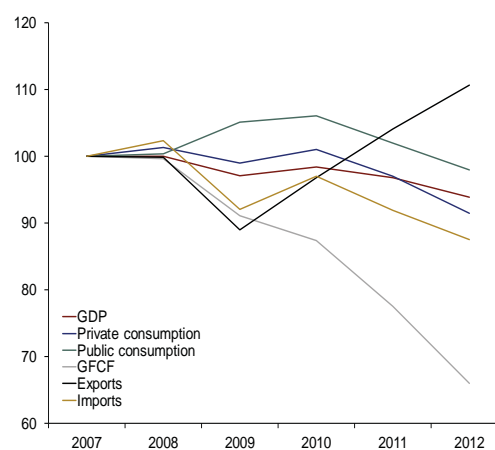
	2007	2008	2009	2010	2011	2012
GDP	2.4	0.0	-2.9	1.4	-1.7	-3.0
Private consumption	2.5	1.3	-2.3	2.1	-4.0	-5.8
Consumption of durable goods	4.4	0.7	-16.9	10.7	-19.6	-22.9
Non-durable consumption	2.3	1.4	-0.6	1.2	-2.2	-4.2
Public consumption	0.5	0.3	4.7	0.9	-3.8	-3.9
Investment	2.1	-0.1	-13.3	-3.6	-13.9	-14.0
GFCF	2.6	-0.3	-8.6	-4.1	-11.3	-14.9
Machinery and metal products	7.9	11.2	-9.9	-6.3	-9.8	-6.3
Transport equipment	8.0	-3.8	-21.8	1.7	-22.8	-31.0
Construction	-0.4	-4.6	-6.6	-4.2	-11.5	-17.9
Other	5.9	2.9	-2.6	-2.1	-1.6	-5.4
Change in inventories <sup>(a)</sup>	-0.1	0.0	-1.1	0.1	-0.5	0.2
Domestic demand	2.0	0.8	-3.3	0.8	-5.7	-6.8
Exports	7.5	-0.1	-10.9	8.8	7.5	6.3
Imports	5.5	2.3	-10.0	5.4	-5.3	-4.7
Contribution of domestic demand to GDP <sup>(a)</sup>	2.2	0.9	-3.6	0.9	-6.2	-7.0
Contribution of net external demand to GDP <sup>(a)</sup>	0.1	-1.0	0.6	0.5	4.5	4.0

Sources: INE and Banco de Portugal.

Notes: (a) Contribution to the real rate of change in GDP in percentage points.

Chart 4.2.1

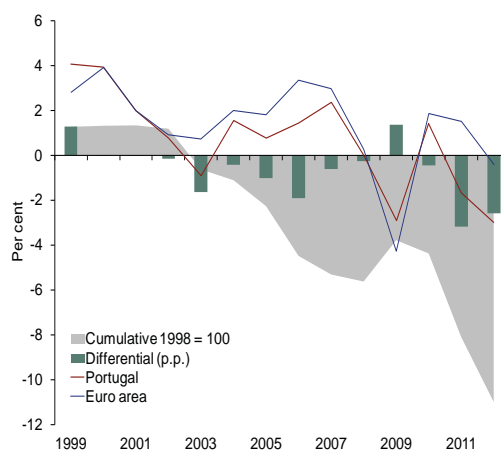
## PORTUGAL – GDP AND MAIN EXPENDITURE COMPONENTS | CUMULATIVE 2007=100



Sources: INE and Banco de Portugal.

Chart 4.2.2

## GDP GROWTH RATE AND DIFFERENTIAL IN PORTUGAL AND THE EURO AREA | RATE OF CHANGE, PER CENT



Sources: Eurostat, INE and Banco de Portugal.

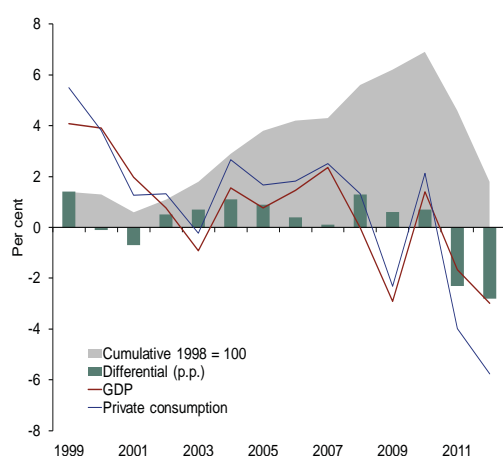
low external financing costs. More recently, in particular following the request for international financial assistance, a process of correction has started as a result of various factors, including a strong revision of economic agents' expectations and the economy's difficulties in obtaining external financing, within the context of the euro area sovereign debt crisis. This aggregate has systematically grown above GDP since the launch of the euro area, which had been viewed as unsustainable in the context of low productivity growth (Chart 4.2.3).

After declining by 4.0 per cent in 2011, private consumption is expected to decrease even more markedly in 2012 (5.8 per cent). Current estimates for the composition of private consumption point to a sharp fall both in the durable and the current goods components (Chart 4.2.4). Durable goods are expected to further decrease very markedly in 2012 (-22.9 per cent, increasing the cumulative decline observed since 2011 to 38 per cent). In turn, consumption of non-durables goods and services is expected to decrease significantly more than in 2011 (-4.2 per cent, compared with -2.2 per cent in 2011), particularly in the non-food component. Given that this component traditionally has a smoother intertemporal profile, this further sharp decrease shows a marked structural adjustment in private consumption.

Private consumption is projected to decrease very markedly in 2012, reflecting the reaction of households to a number of circumstances related to developments in permanent income and uncertainty. First, disposable income – a key factor in household consumption decisions – experienced a reduction in real terms that was largely perceived as permanent. The marked fall in real disposable income reflects in particular the impact of fiscal consolidation measures, specifically a partial suspension of the 13th and 14th extraordinary salary payments – which also affects state-owned enterprises –, an indirect and direct tax increase, and a rise in the prices of certain goods and services subject to regulation. Second, amid continued structural deterioration in the labour market and expectations for economic developments, uncertainty regarding future income increased, leading some households to decrease consumption and build up precautionary savings. Third, the tightening of credit standards on new loans increases the number of households subject to liquidity constraints. The decrease in these households' consumption is unavoidable, particularly for those that must service their debt with the banking system. However, the decrease in money market interest rates since the last quarter of 2011 (around 1.5 p.p.) is expected to have had a significant favourable impact on the interest component of household disposable income, particularly for households with net indebtedness (see "Box 4.1 *The impact of money market interest*

**Chart 4.2.3**

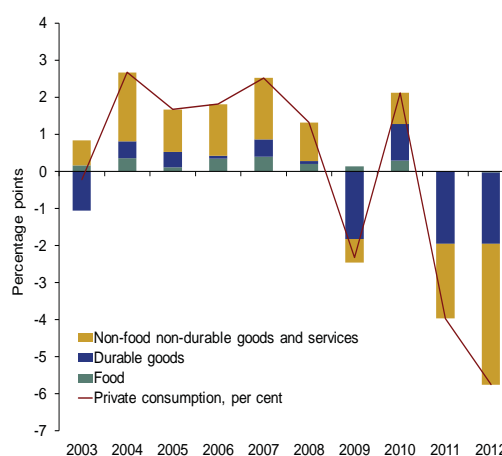
**GDP AND PRIVATE CONSUMPTION | REAL RATE OF CHANGE AND DIFFERENTIAL**



Sources: INE and Banco de Portugal.

**Chart 4.2.4**

**BREAKDOWN OF REAL CHANGE IN PRIVATE CONSUMPTION | CONTRIBUTION TO THE RATE OF CHANGE**



Sources: INE and Banco de Portugal.

*rates on Portuguese households' disposable income"*, in this Bulletin). To sum up, as nominal private consumption is projected to decrease more than household disposable income in 2012, the household saving rate is expected to increase.

Developments in private consumption are accompanied by a contraction in government consumption, which stems from a pro-cyclical fiscal policy stance and interacts with the financial situation of households and enterprises. Within the framework of fiscal consolidation, real government consumption is expected to decrease further in 2012 (-3.9 per cent in 2012, compared with -3.8 per cent in the previous year). As in 2011, underlying this projection is a sharp decrease in expenditure on goods and services, particularly resulting from developments in intermediate consumption and, to a lesser extent, social benefits in kind, and a decrease in compensation of employees. The decrease in compensation of employees reduces income of public employees, contributing to a decline in private consumption, while the decrease in social benefits in kind implies a drop in household income available to spend on private goods. The decline in consumption of goods and services by the general government also impacts on the enterprises operating in these markets, contributing to the contraction in economic activity.

The fiscal consolidation process of the Portuguese economy cannot be delayed and its impact on economic dynamics tends to be negative in the short-term. However, ensuring that this process is sustainable involves both structural measures and decisions establishing which public services are considered essential. The interaction between social choices and an efficient management of resources allocated to the production of goods and services in general government is crucial to the success of the adjustment process of the Portuguese economy.

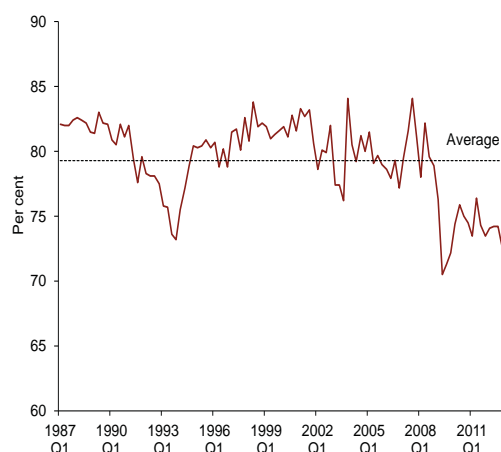
Gross fixed capital formation (GFCF) is expected to further decrease very markedly in 2012. This is a source of concern, particularly for corporate investment, given the fundamental role of investment in potential economic growth. Investment projects are integral to a process of creative destruction, conducive to sustainable productivity increases. If there are no new investment projects, a cycle of new types of wealth creation never starts. Similarly, the benefits of an investment must be assessed correctly (specifically in general government) to avoid repeating investments with low profitability and high future charges, which are a poor allocation of resources in an economy with low ratios of capital per worker.

GFCF is expected to drop in 2012 for the fifth consecutive year, posting a cumulative decline of almost 35 per cent in this period. Current estimates point to a negative change of 14.9 per cent in 2012, accounting for a larger decline than in the previous year. Similarly to 2011, the projected contraction for 2012 is expected both in the public component – related to the fiscal consolidation process – and the private component. Within a framework of fiscal adjustment, public investment is expected to post a cumulative contraction of more than 45 per cent since 2011 and its future developments are expected to continue to be clearly affected by the efforts to consolidate the public accounts. After having been very buoyant in the second half of the 1990s, housing investment is expected to continue on a correction path (decreasing by almost 20 per cent in 2012, with a cumulative decline of more than 60 per cent since the start of the 2000s). In turn, corporate GFCF is expected to decrease by around 12 per cent in 2012, after declines of around 9 per cent in previous years (a cumulative decrease of more than 30 per cent since 2009).

Developments in corporate investment are being affected by cyclical and structural factors. First, the behaviour of the corporate sector reflects deteriorating expectations regarding developments in domestic demand and decreased business confidence, amid high uncertainty and low capacity utilisation in manufacturing (Chart 4.2.5). According to INE's Investment Survey released in July 2012, the share of enterprises reporting investment restrictions increased further (reaching 59.1 per cent in 2012, compared with 55.2 per cent in 2011). Among enterprises reporting investment restrictions, deteriorating demand expectations clearly continue to be the main factor limiting investment, increasing their share in the total in 2012 (Chart 4.2.6). The share of enterprises reporting access to bank loans as the main factor limiting investment increased slightly. In the current situation of low capacity utilisation,

Chart 4.2.5

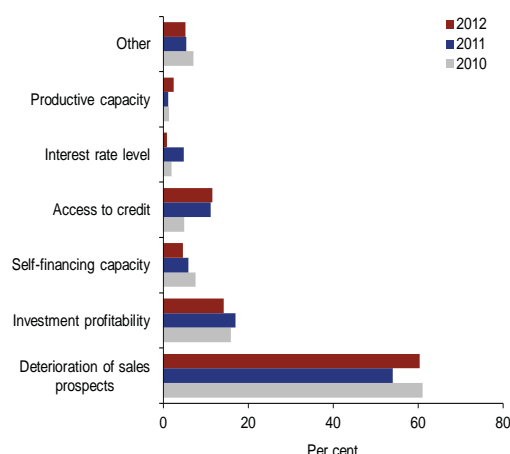
## CAPACITY UTILISATION RATE IN MANUFACTURING



Source: European Commission.

Chart 4.2.6

## MAIN FACTOR LIMITING INVESTMENT | AS A PERCENTAGE OF THE TOTAL NUMBER OF ENTERPRISES WITH INVESTMENT RESTRICTIONS



Source: INE (Investment Survey).

Note: The results shown for each year are based on the Investment Survey published in July.

the financing conditions for enterprises are expected to have a less important role as a factor limiting investment.<sup>4</sup> However, they may become more important as the under-utilisation of inputs decreases, and may help offset a recovery in investment, as well as the high level of corporate indebtedness. Among the remaining factors limiting corporate investment decisions are the predictability of the tax system, labour skills (as they complement investment in physical capital), and the prevailing institutional framework (in particular in terms of market flexibility).

### Considerably buoyant exports in spite of a deteriorating external environment

Structural developments in exports are always dependent on the pattern of comparative advantage made up of technological, geographical and institutional aspects, input allocations and natural resources and business dynamics. In the current global economic context, these factors are interconnected in a complex way, leading to frequent changes in the pattern of comparative advantage and possibly to a relocation of enterprises. Therefore, a structural reform agenda conducive both to increased flexibility in the allocation of domestic resources and the creation of conditions for innovation is essential to potential output growth in Portugal. The recent performance of Portuguese exports of goods and services shows that Portuguese enterprises are increasingly able to operate in a globalised environment by diversifying their product and market base.

Exports of goods and services are expected to slow down in 2012, amid deteriorating global economic activity, specifically in Portugal's main trading partners (see "Section 1 *International environment*", in this Bulletin). However, exports are expected to continue to grow markedly in 2012. The current estimate points to an increase of 6.3 per cent<sup>5</sup> in the volume of exports of goods and services (compared with 7.5

<sup>4</sup> In this respect, the results of the *Inquérito à Justiça Económica* (Survey on economic justice) published by INE for the first time on 29 October 2012 show that difficulties in accessing credit are not one of the main obstacles to business activity. This is irrespective of size although relatively more relevant for small enterprises.

<sup>5</sup> This estimate does not take into account the impact of strikes in the ports sector, with effect from September 2012.

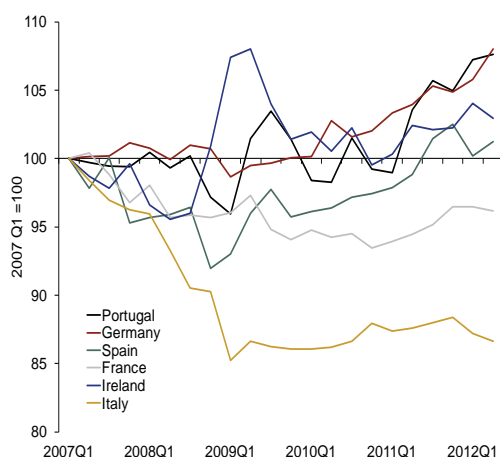
per cent growth in 2011) clearly above expected growth for the euro area. In spite of this deceleration, exports of goods and services are expected to continue to grow considerably above external demand for the Portuguese economy (Chart 4.2.7). The sharp increase in the market share of Portuguese exports (6 per cent in 2012 and around 4 per cent in 2011) reflects, *inter alia*, an increased effort by Portuguese enterprises of tradable goods to seek new markets, against a background where the adjustment in domestic demand is perceived by resident agents as permanent. In addition, relative unit labour costs continued to post a decrease, which has already offset the real cumulative appreciation seen since the start of the participation in the euro area (Chart 4.2.8).<sup>6</sup>

Growth in the volume of exports in 2012 is expected to largely reflect an increase in exports of goods, which are expected to post a rate of change slightly above that of the previous year (8.6 per cent, compared with 8.0 per cent in 2011) (Chart 4.2.9). By contrast, exports of services are expected to strongly decelerate in 2012, largely reflecting the behaviour of the other services component. Underlying the current estimate for 2012 are both a slight deceleration in export growth in the second half of the year and continued considerable market share gains.

Nominal goods exports registered a year-on-year cumulative growth of 9.6 per cent in the first eight months of 2012 (15.1 per cent in 2011 as a whole).<sup>7</sup> Over the same period, exports excluding fuels grew by 7.5 per cent (16.5 per cent in 2011). The decelerating trend in nominal goods exports that started at the end of 2011 was broadly based across goods, with the exception of medium-low-tech products (Table 4.2.2). Medium-low-tech products grew very markedly at the end of 2011 and the start of 2012, reflecting in particular fuel exports, specifically to the United States and Spain. The deceleration in the external trade deflators is in line with international markets (see "Section 4.4 Prices", in this Bulletin).

Chart 4.2.7

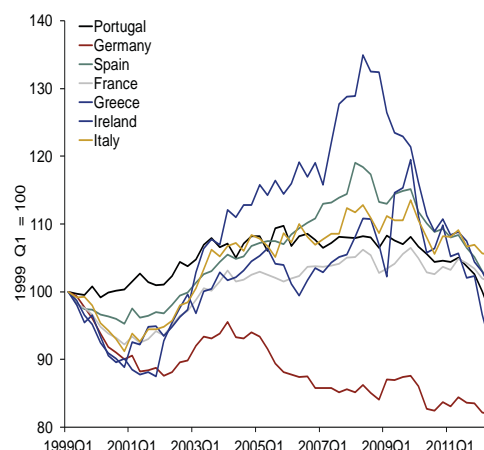
## DEVELOPMENTS IN THE MARKET SHARE OF EXPORTS OF GOODS AND SERVICES



Sources: BCE, Eurostat and INE.

Chart 4.2.8

## RELATIVE UNIT LABOUR COSTS | TOTAL ECONOMY



Sources: BCE and Banco de Portugal.

- <sup>6</sup> Developments in these indicators include changes in private and public wages. As for the Portuguese economy, unit labour costs in total economy and the private sector increased by 25.5 and 27.0 per cent respectively from 1999 to 2012. No statistics are available for developments in private sector unit labour costs for the remaining European countries.
- <sup>7</sup> Exports of goods such as pearls, precious stones and metals, and articles thereof, imitation jewellery and coins (corresponding to chapter 71 of the Combined Nomenclature), in particular non-monetary gold, have a contribution to cumulative change of nominal goods exports of 0.8 p.p. in the first eight months of 2012 (0.9 p.p. in 2011 as a whole), suggesting a shedding of this type of asset.

Table 4.2.2

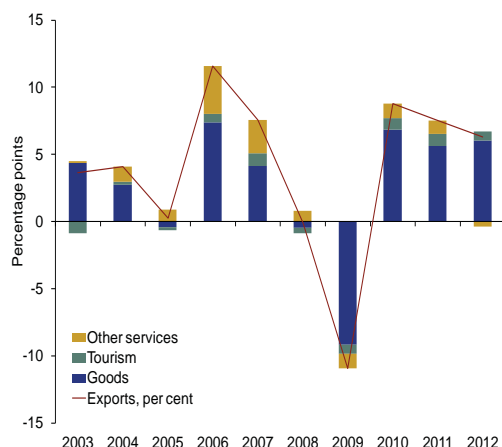
NOMINAL GOODS EXPORTS BY TYPE OF PRODUCT, TECHNOLOGICAL INTENSITY AND COUNTRY OF DESTINATION   RATES OF CHANGE						
	Weights 2011	Year-on-year rate of change (per cent)				
		2010	2011	2012 up to August	2012 Q1	2012 Q2
Total	100.0	16.0	15.1	9.6	11.5	7.3
Total excluding fuels	93.2	11.3	16.5	7.5	8.9	6.1
<i>By type of product</i>						
Agriculture	5.3	14.1	13.2	10.7	11.7	5.6
Food	5.1	2.8	12.5	9.1	11.5	4.9
Mineral fuels	7.3	59.5	25.7	45.9	77.8	23.0
Chemicals	5.7	17.1	29.7	5.4	-6.2	15.6
Rubber and plastic products	6.8	27.7	14.3	7.9	9.4	2.8
Leather, leather products	0.4	23.1	32.8	15.7	28.4	13.5
Wood, cork	3.3	7.6	10.9	3.1	4.3	0.8
Cellulose pulp, paper	5.2	40.7	4.8	-0.4	-1.7	-1.1
Textile products	4.0	13.0	10.4	-2.8	-2.1	-5.7
Clothing	5.6	3.0	7.1	2.6	5.7	-0.1
Footwear	3.7	5.1	15.2	2.4	2.6	2.6
Minerals, ores	5.1	13.0	6.2	9.2	5.4	11.5
Basic metals	8.1	17.3	17.5	8.7	6.1	5.9
Machinery, equipment	14.5	6.3	11.6	14.1	15.4	12.1
Motor vehicles, other transport equipment	13.1	22.2	22.2	-0.1	6.9	0.7
Optical and precision instruments	1.1	18.3	9.3	19.0	14.6	19.5
Other products	5.8	6.8	19.5	17.0	24.5	16.9
<i>By technological intensity<sup>(a)</sup></i>						
High-tech	7.3	10.4	15.5	5.6	6.6	7.2
Medium-high-tech	29.4	19.8	18.2	6.7	7.2	6.8
Medium-low-tech	23.9	18.9	22.0	25.8	33.9	18.6
Low-tech	33.0	11.3	14.8	4.9	7.6	2.3
Residual category	6.4	20.4	-12.9	-7.6	-15.4	-9.1
<i>By country of destination</i>						
Intra-EU	74.1	15.4	13.7	3.8	5.0	3.1
of which:						
Spain	24.9	13.2	7.9	-4.1	-3.2	-5.9
Germany	13.5	16.5	19.2	0.0	5.2	1.0
France	12.1	10.3	17.6	5.9	7.8	1.6
United Kingdom	5.1	12.6	7.0	10.4	14.1	10.9
Italy	3.7	17.4	11.2	2.6	2.5	-1.1
Extra-EU	25.9	17.7	19.5	27.0	32.9	19.6
of which:						
PALOP	6.9	-9.1	20.9	33.5	29.5	31.2
United States	3.5	31.1	12.9	36.8	50.3	12.0
Brazil	1.4	49.5	33.0	20.3	7.6	10.2
China	0.9	6.0	69.7	164.4	184.1	181.3

Sources: INE and Banco de Portugal.

Note: (a) Calculated on the basis of data from INE's International Trade Statistics and the classification of manufacturing industries by technology intensity based on R&D intensities published by the OECD. For further details, see <http://www.oecd.org/dataoecd/43/41/48350231.pdf>. The residual category includes products which cannot be classified, specifically agriculture and mining and quarrying products, and items for which INE does not provide information in sufficient detail for confidentiality reasons, and which cannot therefore be classified by technological intensity.

Chart 4.2.9

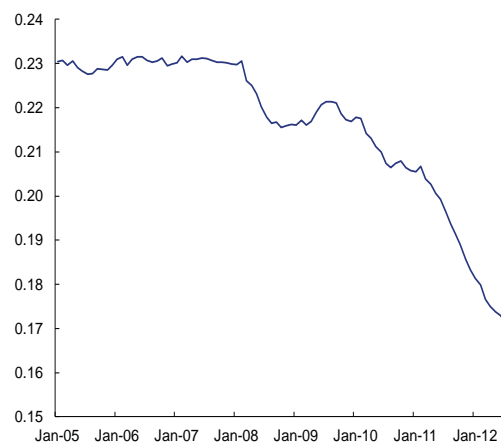
**BREAKDOWN OF REAL CHANGE IN EXPORTS OF GOODS AND SERVICES | CONTRIBUTION TO THE RATE OF CHANGE**



Sources: INE and Banco do Portugal.

Chart 4.2.10

**GEOGRAPHICAL DIVERSIFICATION OF GOODS EXPORTS | HIRSCHMAN-HERFINDAL INDEX**



Source: Banco de Portugal.

Note: A reduction in the index indicates a lower concentration.

An analysis of nominal goods exports by geographical area shows continued geographical diversification of exports (Chart 4.2.10). Intra-EU exports continued the downward trend that was seen throughout 2011 and intensified at the start of 2012 (growing by 3.8 per cent in the first eight months of the year, compared with 13.7 per cent in 2011 as a whole). This deceleration was particularly marked in Portugal's main trading partners belonging to the euro area, particularly Spain (with negative rates of change) and Germany (mostly reflecting very unfavourable developments in exports of motor vehicles and other transport equipment).<sup>8</sup> Extra-EU exports continued the very strong growth of the past years, which has increased their share in Portuguese exports. From among extra-EU countries of destination, exports to Portuguese speaking African countries (PALOP) accelerated – specifically to Angola and particularly medium-high-tech products – and exports to the United States increased markedly, largely reflecting developments in fuel exports. Exports to China (in particular motor vehicles and other transport equipment) grew very strongly since the end of 2011, resulting in a sharp increase in their contribution to export growth (see footnote 7).

In a more unfavourable external environment, tourism exports are expected to slow down in 2012 (growing in volume less than 6 per cent, compared with an increase of 7.3 per cent in 2011). In the first eight months of the year as a whole, overnight stays by foreign tourists in Portuguese hotels increased by 3.8 per cent, compared with 10.1 per cent growth in 2011 as a whole. This deceleration largely reflects unfavourable developments in tourism flows from Spain and the United Kingdom, only partially offset by an increase in tourism from Germany and Denmark. A sharp deceleration in exports of other services is projected for 2012 (after a real rate of change of 5.6 per cent in 2011), in line with the first half of the year. This behaviour is fairly broadly based across types of service and countries of destination.

### ***Sharp fall in imports in line with developments in weighted global demand***

Developments in domestic demand components largely determine developments in imports of goods and services. In 2012 the volume of imports of goods and services is expected to fall by 4.7 per cent,

<sup>8</sup> Before October 2011 exports of passenger cars to China were made indirectly through Germany.



compared with a decrease of 5.3 per cent in 2011. These developments are in line with a fall in weighted global demand, particularly in certain demand components with high import content, such as consumption of durable goods and GFCF in machinery and transport equipment. Nominal imports of services declined by 8.0 per cent year on year in the first eight months of the year, compared with an increase of 5.0 per cent in 2011. Similarly to the previous year, the rate of import penetration in global demand is expected to drop in 2012, in line with usual developments during economic downturns.

### 4.3. Prices

#### *Inflation behaviour was largely affected by the impact of several fiscal consolidation measures*

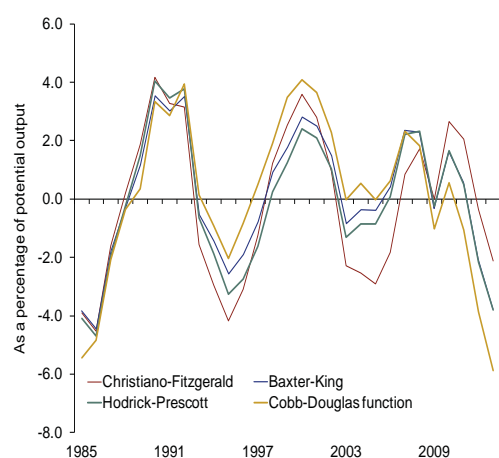
Price developments in the Portuguese economy are structurally anchored to the ECB's monetary policy, which is guided by the principle of price stability over the medium term. This is in strong contrast with previous episodes of adjustments in the external imbalances, specifically in the 1970s and 1980s, when devaluation of the nominal exchange rate to improve external competitiveness led to high inflation rates. In that context, adjustment costs mostly resulted in a decline in households' purchasing power and a decrease in the value of assets in national currency.

In the current context, the deteriorating cyclical position of the Portuguese economy (Chart 4.3.1) leads to an under-utilisation of inputs, exerting downward pressure on goods prices and labour costs. This is one of the channels used to improve the short-term price-competitiveness of the Portuguese economy, in parallel with an ongoing long-term restructuring, which relies more heavily on other aspects of competitiveness.

In 2012, the inflation rate in Portugal – measured by the average change in the Harmonised Index of Consumer Prices (HICP) – is expected to stand at 2.8 per cent, decreasing by 0.8 percentage points (p.p.) compared with 2011 (Chart 4.3.2). Projected inflation for 2012 is largely affected by the impact of several fiscal consolidation measures which were implemented in 2011 and 2012, in particular an increase in the Value Added Tax (VAT) for certain goods, a tax hike on tobacco, and a rise in the price

**Chart 4.3.1**

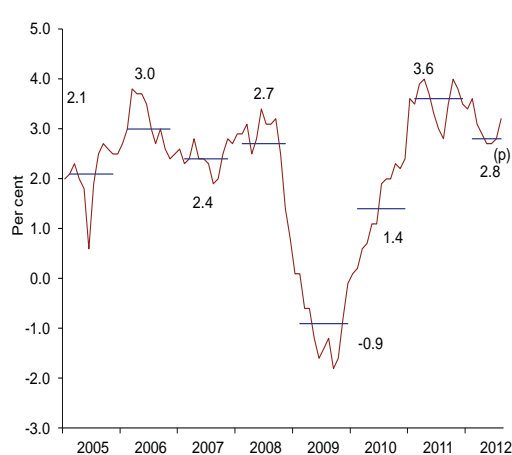
**CYCLICAL POSITION OF THE PORTUGUESE ECONOMY | OUTPUT GAP AS A PERCENTAGE OF POTENTIAL GDP**



Sources: INE and Banco de Portugal calculations.

**Chart 4.3.2**

**HARMONISED INDEX OF CONSUMER PRICES | YEAR-ON-YEAR AND AVERAGE RATES OF CHANGE, PERCENTAGE**



Sources: Eurostat and Banco de Portugal.

Note: (p) - Projection.

of certain goods and services subject to regulation. Current projections point to growth in administered goods and services prices of 4.2 per cent in 2012, compared with 5.4 per cent in 2011.

Underlying the projected inflation rate for 2012 is a deceleration throughout the year, particularly in the last quarter, largely resulting from a gradual fading-out of the abovementioned effects. These developments are expected both in the non-energy component of consumer prices – projected to record a 1.7 per cent change in the year as a whole, compared with 2.3 per cent in 2011 – and the energy component – projected to decelerate from 12.8 per cent in 2011 to 9.9 per cent, in line with developments in international oil prices (Table 4.3.1). Amid a significant contraction in Portuguese economic activity, the inflation rate is therefore projected to already be close to expected levels from the end of the year, taking into account developments in its usual determinants, against a background of a projected strong deceleration in non-energy import prices, lower growth in international oil prices (see “Section 2 *International environment*”, in this Report) and a marked drop in unit labour costs in the economy as a whole, reflecting deteriorating labour market conditions.

Comparing the current projection for Portugal with the average value of the projection range for the euro area inflation rate published in the September 2012 issue of the ECB Monthly Bulletin, the inflation differential relative to the euro area is expected to stand at 0.3 p.p., albeit below its level of 2011 (0.9 p.p.). For the second consecutive year, the inflation differential between Portugal and the euro area average is therefore expected to remain positive, after being negative in 2010 (-0.2 p.p.) and reaching a historical low in 2009 (-1.2 p.p.).

An analysis of consumer price developments on the basis of main HICP aggregates over the first nine months of 2012 shows that the downward trend observed since the start of the year largely reflects the negative year-on-year rates of change in non-energy industrial goods prices (Table 4.3.2). In contrast, services prices and, to a lesser extent, food prices (particularly tobacco prices) have followed an upward trend.

After having decelerated in the first months of 2012, food prices returned to a more marked growth from June 2012 onwards. These developments have largely reflected food commodity prices (in particular cereal prices), which have grown strongly in the second half of the year (see section 2 – *International environment*). In 2012 as a whole, food prices are projected to grow more strongly than in 2011, particularly in the processed food component.

In turn, current estimates point to a marked acceleration in services prices in 2012. These developments

**Table 4.3.1**

PORTUGAL - MAIN INTERNATIONAL PRICE INDICATORS   RATES OF CHANGE, PER CENT						
	2008	2009	2010	2011	2012	
					Q1	Q2
Goods import prices						
Total	4.7	-9.8	5.3	8.9	2.5	1.6
Total excluding fuels	0.4	-5.2	1.5	5.3	-0.4	0.4
Consumer goods	-0.2	-3.8	-1.8	5.4	-1.0	1.4
Food consumer goods	5.9	-4.6	-0.2	12.7	-1.7	0.2
Non-food consumer goods	-3.0	-3.4	-2.5	0.3	-0.4	2.7
International commodity prices						
Oil prices (Brent Blend), EUR	26.6	-33.2	35.4	31.7	17.1	5.1
Non-energy commodity prices, EUR	4.8	-18.8	34.0	13.8	-9.0	-5.3
Food commodity prices, EUR	24.3	-10.4	15.0	20.9	-9.5	0.5
Nominal effective exchange rate index for Portugal	0.9	0.4	-1.5	-0.1	-0.8	-1.7

**Sources:** Eurostat, Thomson Reuters, HWWI, INE and Banco de Portugal.

Table 4.3.2

HICP - MAIN AGGREGATES   AVERAGE ANNUAL AND YEAR-ON-YEAR RATES OF CHANGE, PER CENT										
	Weights 2011	Average annual rate of change					Year-on-year rate of change			
		2008	2009	2010	2011	2012	2011		2012	
		Dec	Dec	Dec	Dec	Sep	Dec	Mar	Jun	Sep
Total	100.0	2.7	-0.9	1.4	3.6	3.2	3.5	3.1	2.7	2.9
Total excluding energy	87.3	2.2	-0.2	0.3	2.3	1.9	2.2	1.9	1.7	1.4
Total excluding unprocessed food and energy	77.7	2.5	0.3	0.3	2.2	1.8	2.2	1.9	1.6	1.2
Goods	58.9	2.4	-2.4	1.7	4.4	3.4	4.3	3.1	2.3	2.5
Food	20.9	4.2	-2.5	0.4	3.0	3.3	2.7	3.2	3.6	3.3
Unprocessed	9.6	0.6	-4.3	0.7	2.9	2.7	2.4	1.8	2.8	3.0
Processed	11.4	8.1	-0.9	0.2	3.1	3.8	3.0	4.3	4.2	3.5
Industrial	38.0	1.4	-2.3	2.4	5.2	3.5	5.2	3.1	1.7	2.1
Non-energy	25.2	-0.2	-0.8	-0.7	1.4	-1.0	1.5	-1.2	-2.4	-3.5
Energy	12.7	6.6	-8.0	9.5	12.8	11.9	12.5	11.1	9.2	12.7
Services	41.1	3.1	1.3	1.0	2.4	2.9	2.3	3.2	3.3	3.5
Memo:										
CPI	-	2.6	-0.8	1.4	3.7	3.3	3.6	3.1	2.7	2.9
HICP - Euro area	-	3.3	0.3	1.6	2.7	2.7	2.7	2.7	2.4	2.6

Sources: Eurostat and INE.

reflect to a large extent both an increase in the prices of certain services subject to regulation and the impact of a hike in the VAT rates for some services. As regards the price increase, both transport prices and hospital services prices rose markedly, mirroring an increase in NHS moderating fees (taxas moderadoras) and a reduction in the State's co-payments for health services. As for the hike in the VAT rates, the prices of "cafés and restaurants" and "cultural services" both posted an increase (after having been moved to the 23 per cent VAT rate).

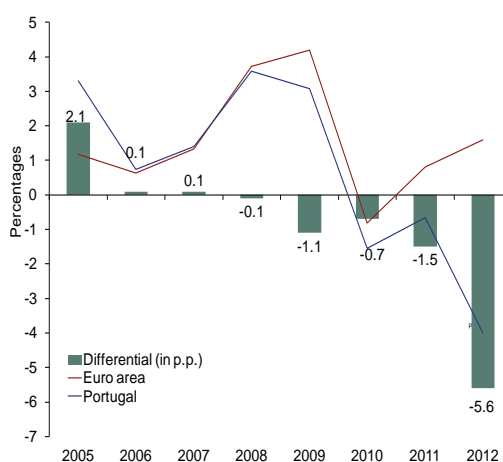
### **Marked decrease in unit labour costs, amid a sharp fall in compensation per employee in the economy as a whole**

According to Banco de Portugal estimates, unit labour costs in Portugal are expected to decrease by 4.0 per cent in 2012, after declining by 0.7 per cent in 2011 (Chart 4.3.3). These developments result, to a large extent, from a sharp fall in compensation per employee in the economy as a whole, particularly in general government, after an average decrease of 0.9 per cent in 2011. Developments in compensation per employee in the economy as a whole mirror public wage measures (specifically a wage freeze and a partial suspension of the 13<sup>th</sup> and 14<sup>th</sup> extraordinary salary payments to public employees). In turn, amid deteriorating labour market conditions and an unemployment rate at historically high levels, growth in compensation is also estimated to have decreased in the private sector as a whole (0.6 per cent, compared with an increase of 0.9 per cent in 2011).<sup>9</sup> Nevertheless, a small positive bias is expected in aggregate compensation, related to a composition effect stemming from a change in the employment structure, which typically occurs in cyclical downturns and is the result of a decline in the weight of lower-income and possibly lower-skilled workers.

<sup>9</sup> Some large-sized public enterprises are considered statistically as belonging to the private sector. These enterprises were also affected by the public wage measures. Consequently, compensation per employee in the private sector in 2012 is expected to also directly reflect the public sector wage reductions.

Chart 4.3.3

UNIT LABOUR COSTS IN TOTAL ECONOMY - PORTUGAL AND THE EURO AREA | RATE OF CHANGE, PER CENT



Sources: European Commission, INE and Banco de Portugal.

By contrast with Portugal, euro area unit labour costs are expected to increase in 2012, according to European Commission projections.<sup>10</sup> The growth differential between unit labour costs in Portugal and the euro area is thus projected to remain negative – unchanged from the four previous years – and to reach a historical low in 2012. Underlying projected growth for euro area unit labour costs are both growth in compensation per employee which is slightly below that of 2011 and a change in productivity per person employed which is close to zero.

#### 4.4. Balance of payments

##### *External borrowing requirements are likely to decline considerably in 2012 as a whole*

The considerable narrowing of the external deficit in 2012 is one of the aspects resulting from the Portuguese economy's adjustment process. The trend observed reflects the combination of the economy's cyclical position and a structural relation between savings and investment. Given the high international investment debt position, such adjustment is likely to be maintained over several years.

In 2012, net external borrowing of the Portuguese economy as a percentage of GDP, which corresponds in large to the combined current and capital account deficits, is expected to decline rather sharply (Table 4.4.1). Hence, the Portuguese economy's external imbalance adjustment path is likely to intensify considerably in 2012, with the combined current and capital account balance standing close to zero at the end of the year. According to current projections, the improvement of the external deficit in 2012 is expected to result from both a further reduction in investment and a significant increase in domestic savings (Chart 4.4.1).

The projected reduction in net external borrowing in 2012 seems to result to a large extent from a considerable improvement in the goods and services account (around 4.0 percentage points of GDP).

<sup>10</sup> European Commission. 2012. "European Economic Forecast – Spring 2012", May.

Table 4.4.1

CURRENT AND CAPITAL ACCOUNTS   A PERCENTAGE OF GDP						
	2010	2011	2012 <sup>(b)</sup>	1st half of the year <sup>(a)</sup>		
				2010	2011	2012
Current and capital accounts	-8.9	-5.3	-0.2	-11.0	-8.3	-1.8
Current account	-10.0	-6.5	-	-11.6	-9.1	-3.5
Goods and services account	-6.7	-3.3	0.8	-7.7	-5.4	-0.9
Goods	-10.5	-7.8	-	-10.6	-8.8	-5.0
Services	3.9	4.5	-	2.8	3.4	4.1
of which:						
Travel and tourism	2.7	3.0	-	1.8	2.0	2.3
Income account	-4.6	-5.0	-	-4.9	-5.8	-4.4
Current transfers	1.3	1.8	-	1.0	2.1	1.9
of which:						
Emigrants/immigrants remittances	1.1	1.1	-	1.0	1.0	1.2
Capital account	1.1	1.2	-	0.6	0.8	1.7

Sources: INE and Banco de Portugal.

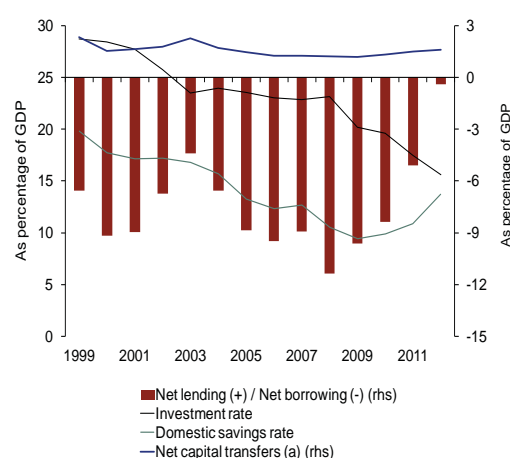
Notes: Notes: (a) Semi-annual estimates of nominal GDP calculated by Banco de Portugal were used to calculate the ratios of the different balance of payments components as a percentage of GDP, in the first half of each year. (b) Banco de Portugal projection.

### Considerable narrowing of the combined current and capital account deficit in the first half of 2012

In the first half of 2012 the combined current and capital account deficit stood at 1.8 per cent of GDP, accounting for a 6.5 percentage point decline from the same period in 2011. This considerable improvement was largely due to the trend of the goods and services account, reflecting an increase in the services account surplus and especially a sharp narrowing of the goods account deficit (Chart 4.4.2), in particular in the non-energy goods component. The narrowing of the goods account deficit reflects a considerable positive volume effect associated with the maintenance of high although decelerating export growth and a very sharp decline in the volume of imports (Chart 4.4.3; “Box 4.2 – *Change in the goods account balance in the first half of 2012*”, in this Bulletin). Breakdown into volume, price

Chart 4.4.1

### CURRENT ACCOUNT BALANCE | AS A PERCENTAGE OF GDP

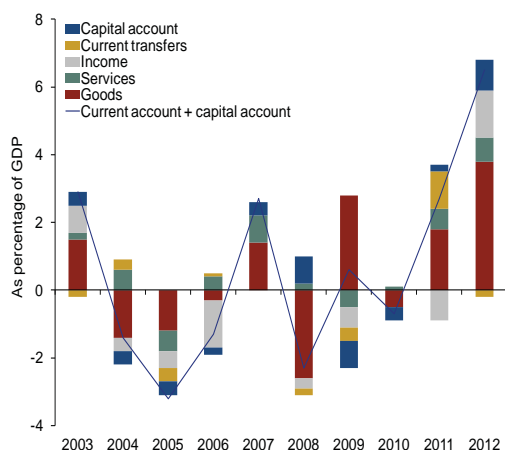


Sources: INE and Banco de Portugal.

Note: (a) Includes acquisitions less disposals of non-financial non-produced assets.

Chart 4.4.2

**BREAKDOWN OF CHANGE IN THE CURRENT AND CAPITAL ACCOUNT (FIRST HALF OF THE YEAR)**  
AS A PERCENTAGE OF GDP

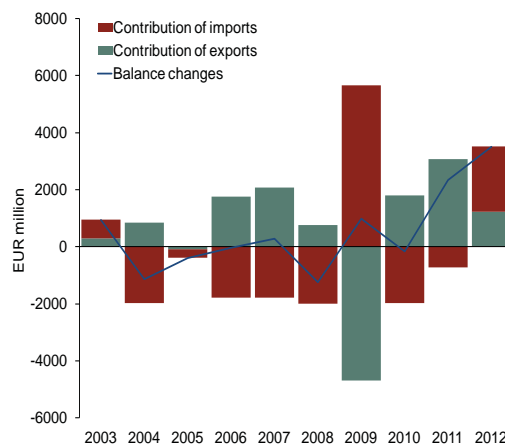


**Sources:** INE and Banco de Portugal.

**Note:** Semi-annual estimates of nominal GDP calculated by Banco de Portugal were used to calculate the ratios of the different balance of payments components as a percentage of GDP, in the first half of each year.

Chart 4.4.3

**CHANGE IN THE GOODS ACCOUNT BALANCE |**  
CONTRIBUTO DAS EXPORTAÇÕES E DAS IMPORTAÇÕES, ANO  
TERMINADO EM JUNHO, EM PORCENTAGEM DO PIB



**Sources:** INE and Banco de Portugal.

**Note:** The contribution of imports corresponds to the symmetric sign of the respective change.

and terms-of-trade effects). In spite of a considerable growth in fuel exports in the first half of the year, resulting in a positive volume effect, the energy component continued to make a negative contribution to the change in the goods and services account balance, largely reflecting a negative price effect.

The improvement of the combined current and capital account balance was also due to a narrowing of the income account deficit, reversing the downward trend observed in the past few years and, to a lesser extent, the widening of the capital account surplus.<sup>11</sup> In turn, the current transfers surplus declined somewhat from the first half of 2011, chiefly as a result of a reduction in public transfers from the European Union.

### ***The economy continued to be financed almost exclusively outside international financial markets***

In spite of indications that risk perception by international investors has gradually improved, financial account developments in the first half of 2012 continued to reflect difficulties in access by resident economic agents to financing in wholesale debt international markets, mainly in medium to long-term maturities. In particular, net liabilities in portfolio investment declined significantly in the first half of the year (Chart 4.4.4). In this context, the financing of the Portuguese economy was partly ensured through recourse by Portuguese banks to ECB's monetary policy operations, which, as regards posting in the financial account, has translated into a significant increase in Target-related liabilities of other

<sup>11</sup> Developments in the income account reflect a change in the Portuguese economy's financing structure, with an increase in official financing sources to the detriment of financing in international markets, translating into the narrowing of the portfolio investment income deficit. In the first half of 2012, all the main income account components (direct investment income, portfolio investment income and labour income) saw their deficits decline, with the exception of other investment income, which reflected an increase in official financing. In this period, the reduction of the direct investment income deficit as a percentage of GDP was particularly significant.

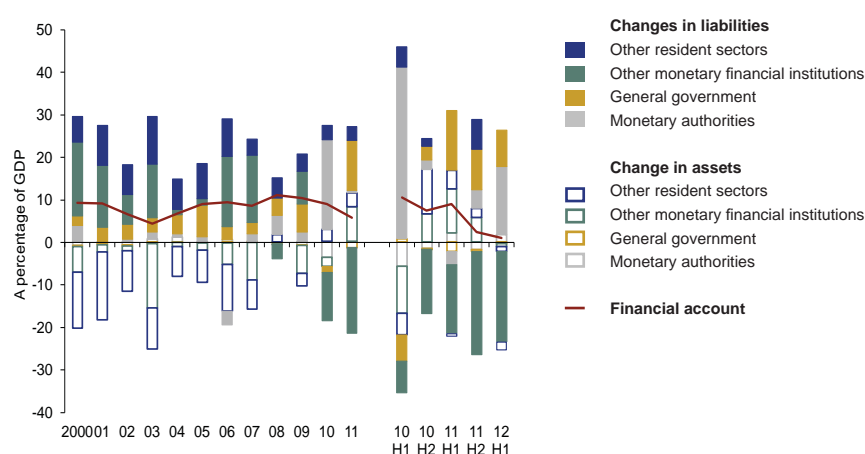
investment by monetary authorities. In effect, similarly to developments in other euro area countries, the maturities of state-backed bank bonds were concentrated in the first quarter of 2012, and were replaced by Eurosystem financing. Moreover, there were strong net inflows into the general government, associated with disbursement payments of loans obtained under the economic and financial assistance programme. It is also worth mentioning the net inflows associated with the acquisition by non-residents of capital shares of large Portuguese corporations (which were reflected in foreign direct investment).

### *Slight worsening in the international investment debt position of the Portuguese economy in the first half of 2012*

The significant moderation in the deterioration of the Portuguese economy debt position vis-à-vis the rest of the world observed in recent years is also part of the adjustment process developments. However, the (net) debt position of the Portuguese economy vis-à-vis the rest of the world has increased slightly, to stand at 108.6 per cent of GDP at the end of first half of 2012 (Chart 4.4.5). This rise of 3.6 per cent of GDP exceeded the financial account balance (1.0 per cent of GDP), chiefly as a result of the significant valuation of investment portfolio liabilities, in line with the fall in medium and long-term bond yields of Portuguese issuers, with a special focus on the increase in the value of Portuguese government debt securities.

Chart 4.4.4

#### FINANCIAL ACCOUNT | BALANCE AND CHANGES IN ASSETS AND LIABILITIES BY INSTITUTIONAL SECTOR

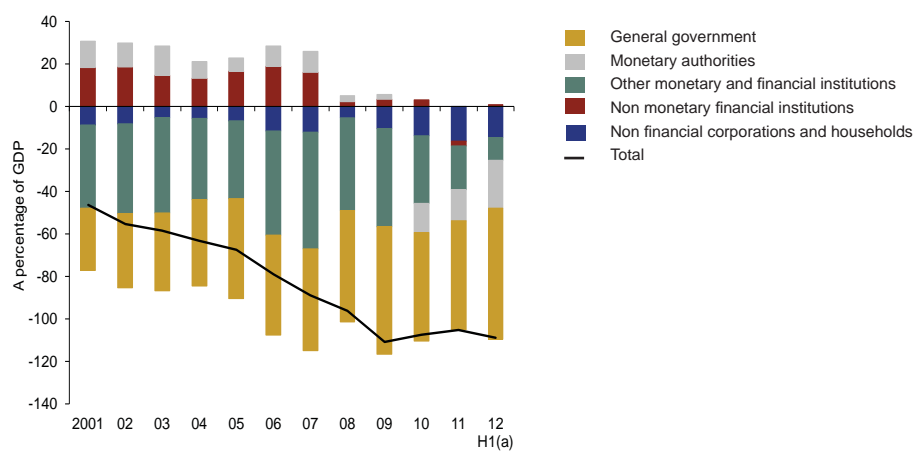


Sources: INE and Banco de Portugal.

Note: A (+) sign means an increase in foreign liabilities or a decrease in foreign assets, i.e. a financial inflow. A (-) sign means a decrease in foreign liabilities or an increase in foreign assets, i.e. a financial outflow. Figures for "Other investment of monetary authorities and other monetary financial institutions" are adjusted for temporary end-year operations between these two sectors, which were reversed in the first days of the following year. The change in assets includes financial derivatives net of liabilities.

Chart 4.4.5

## INTERNATIONAL INVESTMENT POSITION | BY INSTITUTIONAL SECTOR



**Sources:** INE and Banco de Portugal.

**Note: (a)** Using the GDP for the year ending in the first half of 2012.



## BOX 4.1 | THE IMPACT OF MONEY MARKET INTEREST RATES ON PORTUGUESE HOUSEHOLDS' DISPOSABLE INCOME

This box analysis the impact of a decrease in money market interest rates on households' disposable income, taking into account a set of simplifying assumptions. This analysis shall not go beyond the direct effect of interest rates on disposable income, disregarding their impact on savings decisions, the asset portfolio structure and the indirect impacts on investment decisions indirectly affecting households' disposable income. The analysis in this box involves two steps: (i) an analysis of the asset and liability structure of Portuguese households and their return (ii) a simulation of the pass-through from money market interest rates to the interest rates on savings' instruments.

### *Households' financial assets and liabilities: composition and return*

The pass-through of changes in money market interest rates to households' disposable income depends on the structure of the asset portfolio and, in particular, on the relationship between the volume of interest-bearing assets and liabilities. In the 1999-2011 period, the households' financial asset portfolio showed a relatively stable structure, in spite of an increase in the most recent period in interest-bearing assets, as opposed to listed securities. This change reflects a rise in risk aversion by households, against the background of high price volatility in the securities market.<sup>1</sup>

Households' financial liabilities are chiefly comprised of bank loans and, during the period under review, rose from around 70 per cent to 130 per cent of disposable income. The increase in households' indebtedness is in contrast with a relative stability of the weight of financial assets in households' disposable income (Chart 1). In this context, households' disposable income became gradually more responsive to bank interest rate developments.

The asset portfolio structure and the rise in indebtedness described above, as well as bank interest rate developments, have determined, in aggregate terms, that households were again net interest receivers in 2011, a situation that had not been observed since the end of the 1990s (Chart 2). This change occurs in a context of (i) reduction of lending interest rates, in line with the main benchmark rates, notwithstanding the rise in the risk premia of new operations; and (ii) rise in borrowing interest rates.

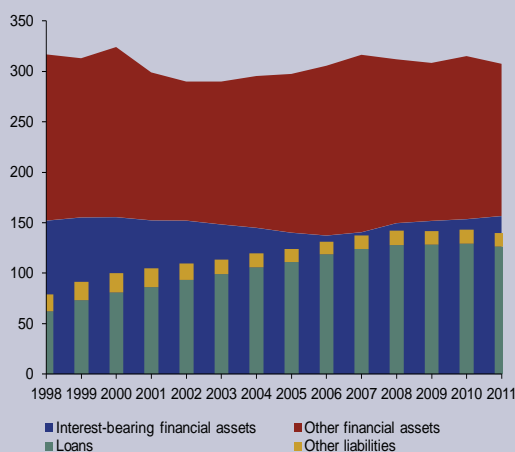
The interest rate spread of time deposits and savings/Treasury certificates *vis-à-vis* the benchmark rate remained stable in the period under review, whereas the yield of other interest-bearing securities did not show a clear relationship with the benchmark rate. However, since 2009, the interest rates of time deposits have had a distinct behaviour, and have not followed the decrease in money market interest rates, thus exceeding those rates for the first time. These developments reflect an active policy conducted by Portuguese banks of collecting deposits from customers, amid persisting difficulties in access to international wholesale financing markets.

Interest rate developments in the different financial assets suggest that the impact of changes in money market rates may be an important determining factor behind the trend of the interest component of households' disposable income. The pass-through of money market rates to lending interest rates tends to be relatively swift and complete, translating the nature of the contractual conditions for setting interest rates in Portugal. On the other hand, the pass-through tends to be partial and slower in the case of time deposits. The rates on financial instruments made available by the public sector in the retail market

<sup>1</sup> The structure in Chart 1 considers financial accounts data and is therefore affected by changes in the market value of securities. However, when analysing the value of the transactions, which enables the price effect to be purged, this conclusion is still valid.

Chart 1

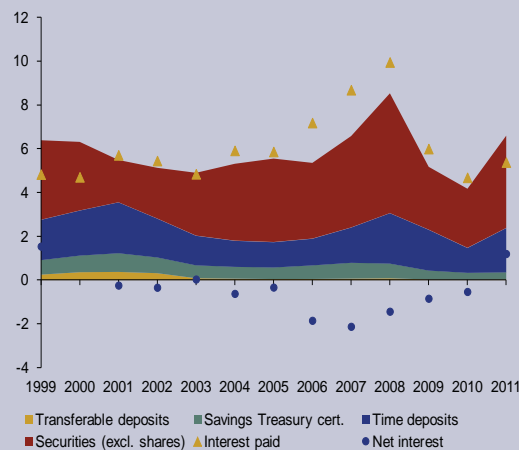
**HOUSEHOLDS' FINANCIAL ASSETS AND LIABILITIES | AS A PERCENTAGE OF DISPOSABLE INCOME**



Sources: INE and Banco de Portugal.

Chart 2

**INTEREST RECEIVED AND PAID BY HOUSEHOLDS | AS A PERCENTAGE OF DISPOSABLE INCOME**



Sources: INE and Banco de Portugal's calculations.

Notes: Calculated on the basis of interest of Quarterly National Accounts per Institutional Sector published by INE; the breakdown of interest received corresponds to an estimate of Banco de Portugal.

(savings/Treasury certificates) show characteristics that are similar to those of time deposits, standing in contrast with other interest-bearing securities, for which the implied rate of return shows characteristics that can hardly be associated with money market interest rate developments.

According to the analysis above, the impact of changes in monetary policy rates on households' disposable income depends not only on the level of their interest-bearing financial assets and liabilities, but also on the structure of their interest-bearing investments, given that the response of their rate of return to benchmark interest rate developments is heterogeneous.

### **Impact of shocks in monetary policy rates on households' disposable income**

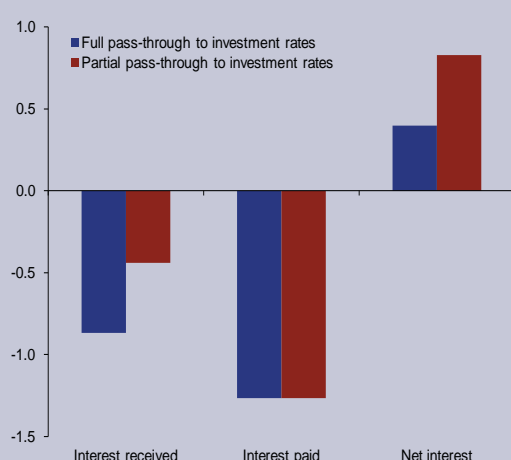
The estimation presented in this box considers the impact of a 100 basis point decrease in money market interest rates on households' disposable income, taking into account the structure of the portfolio of financial assets in 2011, and immediate pass-through. In order to evaluate the responsiveness of the results to different pass-through levels, two alternative scenarios were considered: a first one where the money market rate reduction passes through fully to the interest rates on time deposits and savings/Treasury certificates; a second one where only 50% of the interest rate fall passes through to the rate of return of these investments.

The results obtained point to significant impacts of a decrease in benchmark interest rates on households' disposable income. The drop in interest received depends on the degree of the pass-through assumed, which ranges from 0.4 to 0.8 per cent of disposable income (Chart 3). The recent changes in households' asset portfolio towards interest-bearing instruments have raised their responsiveness to the interest rate. As regards interest paid, its impact is -1.3 per cent of disposable income, reflecting the high household indebtedness level. Overall, the impact on net interest is +0.8 per cent of disposable income in the case of a partial pass-through to savings' instruments, and +0.4 per cent in the event of a full pass-through.

In sum, money market interest rate cuts in the last quarter of 2011 and in the course of 2012 (approximately 150 basis points) and their subsequent pass-through to bank interest rates have had a non-negligible impact on households' disposable income, due to their high indebtedness level and the contractual mechanisms for setting lending interest rates. From a disaggregated perspective, money market interest rate cuts have a very significant impact on households' disposable income with a net debtor position, contributing to easing the respective debt service burden. This conclusion applies, in particular, to households with loans for house purchase, which are usually linked to the three-month and six-month Euribor, and are characterised by longer maturities and fixed spreads.

**Chart 3**

**IMPACT OF A 100 POINT BASIS CUT IN THE BENCHMARK RATE ON DISPOSABLE INCOME | AS A PERCENTAGE OF DISPOSABLE INCOME**



**Source:** Banco de Portugal's calculations.

## BOX 4.2 | CHANGE IN THE GOODS ACCOUNT BALANCE IN THE FIRST HALF OF 2012

### Decomposition into volume, price and terms-of-trade effects

In the first half of 2012, the goods account deficit narrowed rather significantly, strengthening the adjustment process started in 2011. The developments of the goods account balance may be analysed by decomposing the respective change into four effects: volume, price, terms-of-trade, and cross effects. The volume effect is the result of the impact on the balance resulting from the change in the volume of goods exported and imported:

$$X_{t-1}.vx_t - M_{t-1}.vm_t$$

The terms-of-trade effect, in turn, reflects the impact of the relative change in export ( $px_t$ ) and import prices ( $pm_t$ ):

where  $X_{t-1}$  and  $M_{t-1}$  represent nominal exports and imports of goods in  $t-1$ , period respectively, whereas  $vx_t$  and  $vm_t$  represent rates of change in volume of exports and imports in  $t$  period. The terms-of-trade effect, in turn, reflects the impact of the relative change in export ( $px_t$ ) and import prices ( $pm_t$ ):

$$[X_{t-1} \cdot (px_t - p_t)] - [M_{t-1} \cdot (pm_t - p_t)]$$

where  $p_t$  represents the average rate of change of external trade prices in  $t$  period  $(px_t + pm_t) / 2$ . The price effect measures the impact on the balance due to the average growth of international trade prices in  $t$  period  $t$ :

$$X_{t-1} \cdot p_t - M_{t-1} \cdot p_t$$

Finally, the cross effect reflects the residual impact of the interaction between volume and price changes in both exports and imports:

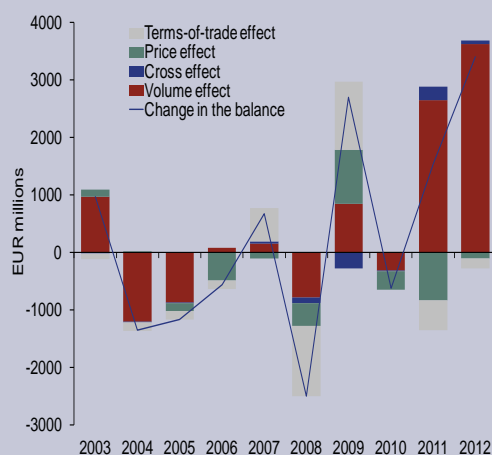
$$[X_{t-1} \cdot vx_t \cdot px_t] - [M_{t-1} \cdot vm_t \cdot pm_t]$$

The impressive decline in the goods account deficit in the first half of 2012 vis-à-vis the similar period of the previous year largely reflects a very significant volume effect (Chart 1), particularly in the non-energy component, associated with the maintenance of high export growth, albeit decelerating, and a very sharp decline in the volume of imports. As regards the non-energy component, and in addition to a significant volume effect, the terms-of-trade effect was higher than in the same period of 2011, largely reflecting the fall in prices of domestic imports of goods excluding fuel (Chart 2). In turn, the fall in the average prices of international trade excluding fuel translated into a virtually nil price effect in the first half of 2012, following the significant negative impact in 2011.

In contrast, the energy component has contributed negatively to the change in the goods and services account balance, chiefly reflecting a negative price effect, in spite of a deceleration in fuel prices in the first half of the year (Chart 3). This impact, however, was mitigated by a positive volume effect.

Chart 1

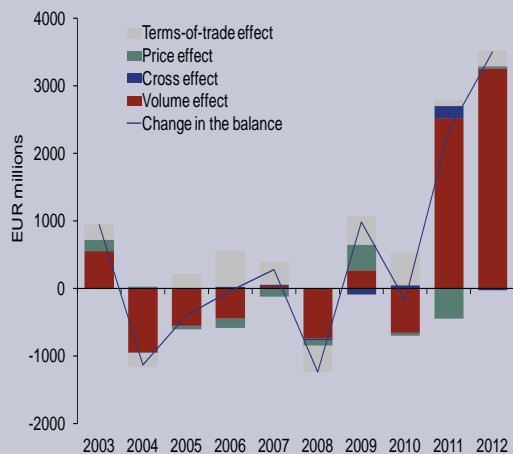
**DECOMPOSITION OF THE CHANGE IN THE GOODS ACCOUNT BALANCE – 1ST HALF-YEAR**  
| DECOMPOSITION INTO VOLUME, PRICE AND TERMS-OF-TRADE EFFECTS (EUR MILLIONS)



Sources: INE e Banco de Portugal.

Chart 2

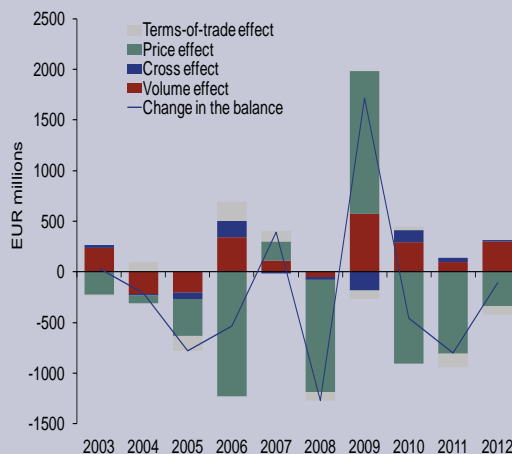
**DECOMPOSITION OF THE CHANGE IN THE GOODS ACCOUNT BALANCE EXCLUDING FUEL – 1ST HALF-YEAR**  
| DECOMPOSITION INTO VOLUME, PRICE AND TERMS-OF-TRADE EFFECTS (EUR MILLIONS)



Sources: INE and Banco de Portugal.

Chart 3

**DECOMPOSITION OF THE CHANGE IN THE ENERGY GOODS ACCOUNT BALANCE – 1ST HALF-YEAR**  
| DECOMPOSITION INTO VOLUME, PRICE AND TERMS-OF-TRADE EFFECTS (EUR MILLIONS)



Sources: INE and Banco de Portugal.



## OUTLOOK FOR THE PORTUGUESE ECONOMY: 2012-2013

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Outlook for the Portuguese Economy: 2012-2013

The current projections for the Portuguese economic activity envisage a further contraction in 2013 (1.6 per cent), albeit of a smaller magnitude than projected for 2012 (3 per cent) (Table 1). This projection is influenced by the degree of uncertainty about developments in the external environment – particularly as regards implementation of measures to solve the sovereign debt crisis in the euro area –, the impact of domestic economic policy measures – especially the recently announced fiscal measures –, the response of economic agents – given the magnitude of the measures – and the nature and speed of the economy's medium to long-term adjustment process. This combination of factors results in a substantial magnitude of the confidence interval of projections around the baseline projection.

The contraction of Gross Domestic Product (GDP) for the third consecutive year occurs in the context of the structural imbalances adjustment process framed by the Economic and Financial Assistance Programme (EFAP). This process has translated into a considerable reduction of public and private domestic demand, which should reach around 17 per cent in cumulative terms in the 2011-2013 period. Notwithstanding the high uncertainty characterising the international environment, exports have been growing significantly more than external demand for Portuguese goods and services, and this is expected to be maintained in 2013. Export developments should continue to mitigate the impact of domestic demand developments on economic activity, with considerable growth projected for this component in 2013, which contributes to the current and capital account surplus projected for this year.

### ***Moderate recovery of external demand in 2013 after virtual stagnation in 2012 and maintenance of money market interest rates at very low levels***

The current projection has an underlying set of assumptions regarding the Portuguese economy's external environment, public finance developments and domestic financing conditions, based on information available up to mid-October (Table 2).

**Table 1**

PROJECTIONS OF BANCO DE PORTUGAL: 2012-2013   ANNUAL RATE OF CHANGE, PER CENT							
	Weights 2011	EB Autumn 2012			EB Summer 2012		
		2011	2012 <sup>(p)</sup>	2013 <sup>(p)</sup>	2011	2012 <sup>(p)</sup>	2013 <sup>(p)</sup>
Gross Domestic Product	100.0	-1.7	-3.0	-1.6	-1.6	-3.0	0.0
Private consumption	66.3	-4.0	-5.8	-3.6	-4.0	-5.6	-1.3
Public consumption	20.1	-3.8	-3.9	-2.4	-3.8	-3.8	-1.6
Gross fixed capital formation	18.1	-11.3	-14.9	-10.0	-11.3	-12.7	-2.6
Domestic demand	103.8	-5.7	-6.8	-4.5	-5.7	-6.4	-1.4
Exports	35.5	7.5	6.3	5.0	7.6	3.5	5.2
Imports	39.3	-5.3	-4.7	-2.3	-5.3	-6.2	1.5
Contribution to GDP growth (in p.p.)							
Net exports		4.5	4.0	2.8	4.6	3.6	1.4
Domestic demand		-6.2	-7.0	-4.5	-6.2	-6.6	-1.4
of which: change in inventories		-0.5	0.2	-0.1	-0.5	0.1	0.2
Current plus capital account (% of GDP)		-5.3	-0.2	4.0	-5.2	-1.7	0.8
Trade Balance (% of GDP)		-3.3	0.8	4.5	-3.2	0.4	2.5
Harmonised Index of Consumer Prices		3.6	2.8	0.9	3.6	2.6	1.0

**Sources:** INE and Banco de Portugal.

**Notes:** (p) – projected. For each aggregate, this table shows the projection corresponding to the most likely value, conditional on the set of assumptions considered, which are based on the information available up to mid-October 2012.

Table 2

PROJECTION ASSUMPTIONS							
		EB Autumn 2012			EB Summer 2012		
		2011	2012	2013	2011	2012	2013
External demand	aar	3.4	0.3	2.5	3.7	-0.2	3.5
Interest rate							
3-month EURIBOR	%	1.4	0.6	0.2	1.4	0.7	0.6
State financing cost <sup>(a)</sup>	%	4.3	2.2	2.7	4.3	2.3	2.5
Euro exchange rate							
Euro effective exchange rate	aar	-0.2	-5.4	-0.2	-0.2	-5.2	-0.8
Euro-dollar	aav	1.39	1.28	1.29	1.39	1.27	1.25
Oil price							
in dollars	aav	111.0	112.4	107.8	111.0	107.4	96.6
in euros	aav	79.7	87.5	83.4	79.7	84.3	77.4

**Sources:** Bloomberg, ECB, Thomson Reuters and Banco de Portugal calculations.

**Notes:** aar - annual average rate of change, % - per cent, aav - annual average value. An increase in the exchange rate represents an appreciation. **(a)** This assumption reflects the cost of financing sources relevant to the Portuguese State in this period, among which the estimated cost of financing associated with the Economic and Financial Assistance Programme.

According to the European Central Bank (ECB) staff macroeconomic projections published in the September issue of the ECB Monthly Bulletin, worldwide activity is likely to accelerate slightly in 2013. This reflects continuing robust growth of activity in emerging market economies, notwithstanding the recent deceleration. Growth in a number of advanced economies should continue to be restrained by labour market dynamics and adjustment in the construction sector, as well as by the need for deleveraging in the public and private sectors. In this context, economic activity in the euro area is expected to grow further, albeit moderately, in 2013, following a slight drop in 2012. Projections released in the September issue of the ECB Monthly Bulletin point to a decline in euro area GDP of between 0.2 and 0.6 per cent in 2012, followed by a change of between -0.4 and 1.4 per cent in 2013. Developments projected for the euro area are expected to make an important contribution to the deceleration in external demand for Portuguese goods and services in 2012 to 0.3 per cent, given the high weight of trade with euro area countries in total exports. In 2013, however, external demand should rebound moderately, growing by 2.5 per cent. These assumptions imply an upward revision of growth in external demand for Portuguese goods and services in 2012 (0.5 percentage points (p.p.)) and a downward revision in 2013 (-1 p.p.) compared with the previous *Economic Bulletin*.

Technical assumptions for exchange rates, which consider the maintenance of average values observed in the two weeks prior to the cut-off date, imply a nominal depreciation of the euro both in nominal effective terms and against the US dollar in 2012. For 2013 these assumptions translate into a virtual stabilisation of the euro effective exchange rate and a slight appreciation against the US dollar. These assumptions imply a smaller depreciation of the euro against the US dollar and in nominal effective terms in the 2012-2013 period than that considered in the Summer edition of the *Economic Bulletin*.

According to information available in the futures market, the oil price in US dollars is expected to decline by around 4 per cent in 2013, following a virtual stabilisation in 2012. This accounts for an upward revision of this commodity's price compared with the assumptions presented in the previous *Economic Bulletin*.

The Portuguese economy's financing conditions are expected to be influenced over the projection horizon by a series of non-standard measures recently adopted by the ECB to support liquidity in the banking system, as well as by the programme of Outright Monetary Transactions in secondary markets for sovereign bonds aimed at correcting distortions in the pricing of these assets (see "Box 1.2 Non-standard monetary policy in major advanced economies" in this Bulletin). According to the information available in the futures market, the levels of three-month EURIBOR interest rates should be very low over



the projection horizon (0.6 per cent in 2012 and 0.2 per cent in 2013). These assumptions lead to a downward revision compared with those considered in the previous *Economic Bulletin*. With regard to domestic financing conditions, the spreads between bank lending interest rates and the money market reference rate are expected to increase slightly up to the beginning of 2013, declining progressively in the course of that year. Assumptions for the Portuguese State's financing costs relevant over the projection horizon reflect an estimate of the average external financing cost rate within the scope of the EFAP, as well as an estimate of the interest rate underlying the sovereign debt issues expected for 2013. According to these assumptions, following a considerable reduction in 2012 the State's financing costs are expected to increase moderately in 2013.

Technical assumptions for public finances follow the rules used in Eurosystem projection exercises, and thus only take into account fiscal policy measures already approved or highly likely to be approved within the scope of the legislative process and specified in sufficient detail. As such, these assumptions reflect the measures underlying the Draft State budget for 2013. Hence, current projections include a reduction in public consumption and investment in 2013, although of a smaller magnitude than anticipated for the current year.

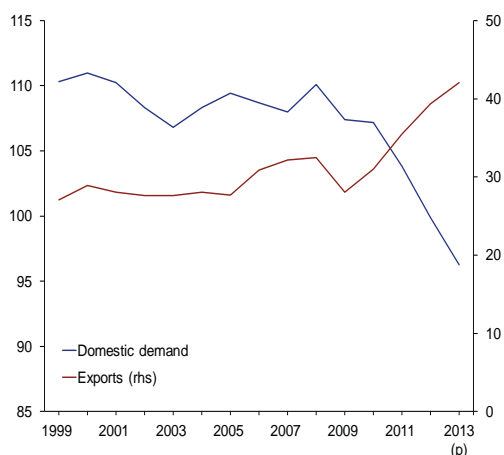
### ***Further contraction of GDP in 2013, although showing a recovery trend over the year***

According to current projections, GDP is expected to decline by 3 per cent in 2012 (see "Section 4 *The Portuguese Economy Adjustment*" in this Bulletin). This sharp contraction in activity reflects domestic demand developments, especially the reduction in private consumption and gross fixed capital formation (GFCF). In particular, developments in these components at the end of the year should be partially influenced by a deterioration of economic agents' confidence, in the context of the release of additional fiscal consolidation measures for 2013 not included in the projections of the previous *Economic Bulletin*. However, exports should continue to accelerate year on year over the second half of 2012, in line with information on goods trade in the most recent months. These developments contribute to changes in the composition of expenditure in 2012 in comparison with the one presented in the Summer edition of the *Economic Bulletin*, although the projection for GDP remains unchanged, given that the upward revision of export growth was offset by less favourable developments in domestic demand.

Current projections point to a further contraction in economic activity in 2013, by 1.6 per cent. Domestic demand, particularly private consumption and GFCF, are expected to decline further significantly in 2013, although less than projected for this year. In turn, exports should maintain a robust growth, with an average contribution to economic activity developments of about 2 percentage points in 2012-2013. This dynamics should lead to the maintenance of a GDP recomposition process towards an increase in the weight of exports (Chart 1). This evolution in annual average terms has an underlying recovery path over the year, which largely reflects developments projected for domestic demand, implying positive quarter-on-quarter rates of change in GDP in the second half of 2013.

Private consumption in particular is expected to decline by 3.6 per cent in 2013, implying a cumulative fall of around 13 per cent in the 2011-2013 period, which is slightly more marked than that projected for real disposable income in the same period. This implies that the savings rate in 2013 is expected to stand at a level higher than that observed in 2010, and slightly below projections for 2012 (Chart 2). Developments in real disposable income in 2013, which are expected to imply a decline close to the one projected for 2012, largely reflect the impact of the fiscal consolidation measures to be adopted in this period, especially changes in indirect taxes. The reduction of compensation of employees in the private sector, in a context of continuing deterioration of labour market conditions and a virtual stagnation of wages in this sector, are also expected to condition the profile projected for disposable income. The difficulty in smoothing private consumption given disposable income developments in the 2011-2013 period reflects some specific characteristics of the current downturn, namely the nature of the fiscal

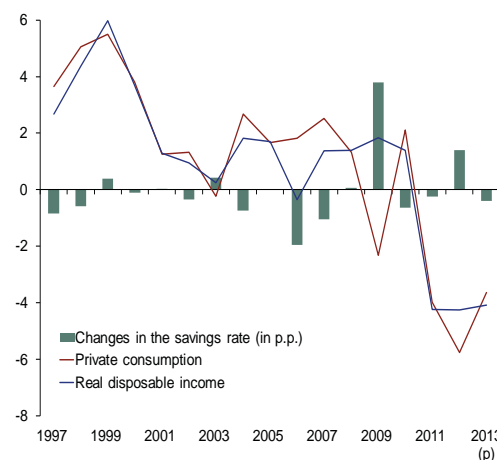
Chart 1

DOMESTIC DEMAND AND EXPORTS | AS A  
PERCENTAGE OF NOMINAL GDP

Sources: INE and Banco de Portugal.

Note: (p) – projected.

Chart 2

CONSUMPTION, DISPOSABLE INCOME, AND  
SAVINGS RATE | ANNUAL AVERAGE RATE OF CHANGE

Sources: INE and Banco de Portugal.

Notes: (p) – projected. The savings rate is represented as a percentage of disposable income.

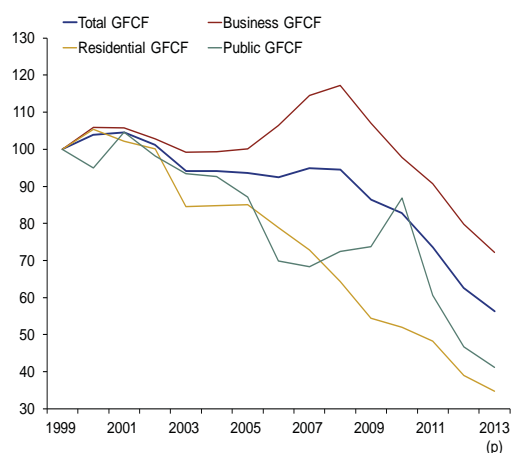
consolidation measures adopted, which may be perceived by agents as extending over a long period of time, and as such affecting their assessment of permanent income. The high degree of uncertainty associated with the dynamics of the economy's adjustment process and the labour market situation should also contribute to the postponement of consumption expenditure, particularly on durables, in a context of tight financing conditions.

GFCF is expected to decline by 10 per cent in 2013, after a reduction of around 15 per cent in 2012. However, this decline, which extends to all institutional sectors, should however be larger in the public sector, in the context of the ongoing fiscal consolidation process (Chart 3). Projected GFCF developments imply the maintenance of a sharp reduction trend in the weight of this component in GDP since 2009, which reflects a combination of cyclical and structural factors. In fact, low demand expectations at the domestic level and high uncertainty at a global scale should continue to affect corporate investment decisions, in the context of a structural deleveraging process in the private sector, including the financial sector, with consequences for corporate financing conditions. In addition, as far as residential GFCF is concerned, these developments, which largely reflect the dynamics projected for disposable income, are part of an adjustment trend of this component, given its strong growth in the course of the 1990s. Notwithstanding the reduction projected in annual average terms, GFCF is expected to recover throughout 2013, since private GFCF should benefit from progressively less unfavourable financing conditions and, in the case of business GFCF, from the maintenance of buoyant export growth.

Exports are projected to grow by 5 per cent in 2013, compared with 6.3 per cent in 2012. The projected developments for exports, which contrast with the assumption of acceleration in external demand in 2013, largely reflect the evolution assumed for the market share. In fact, export growth in 2012 is expected to translate into a 6 per cent gain in market share, whose dynamic effects should largely contribute to a 2.5 per cent gain in 2013. This evolution implies the recovery of market share loss accumulated since the mid-1990s (Chart 4). The gain in market share in 2012, which is expected to extend to intra and extra-EU markets, reflects to some extent a diversification trend of the geographical destinations of Portuguese exports, particularly to markets outside the European Union. In particular, over the past few months the nominal market share of goods in the extra-EU market has been quite dynamic (notwithstanding a significant associated volatility), contrasting with some deceleration in the intra-EU share. Throughout the projection horizon a partial unwinding of this diversification effect is

Chart 3

## BREAKDOWN OF GFCF BY INSTITUTIONAL SECTOR | INDEX 1999=100

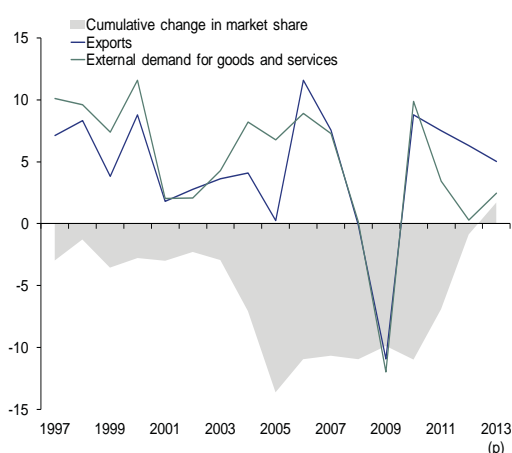


Sources: INE and Banco de Portugal.

Note: (p) – projected.

Chart 4

## EXPORTS, EXTERNAL DEMAND AND MARKET SHARE | ANNUAL RATE OF CHANGE



Sources: ECB, INE and Banco de Portugal.

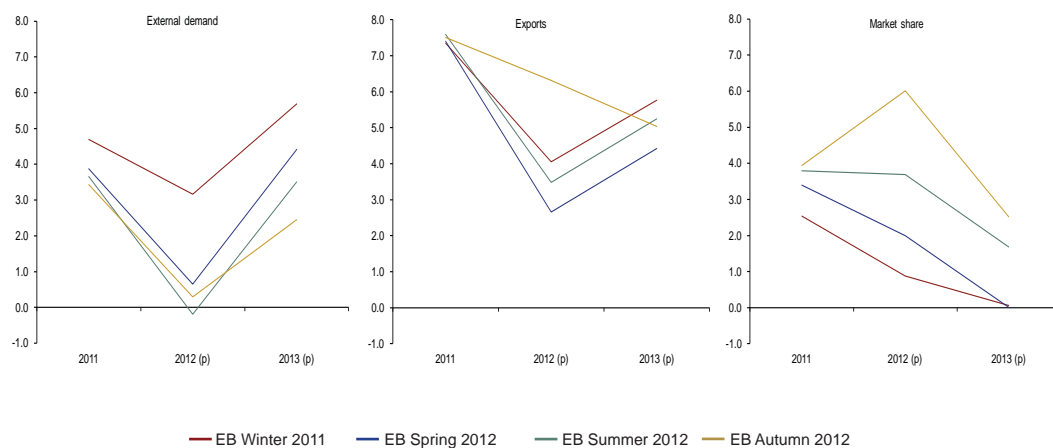
Note: (p) – projected.

expected, as thus a moderation in market share gains. However, current projections show an upward revision of growth in market share, similarly to previous editions of the *Economic Bulletin* (Chart 5). Hence, export developments in 2013 are expected to reflect, in addition to the dynamic effects resulting from gains in market share in 2012, a few small additional gains in market share over the year, as well as external demand developments.

According to current projections, after a 4.7 per cent contraction in 2012, imports should decline by 2.3 per cent in 2013, although recovering over the year, in line with import content-weighted overall demand developments. This corresponds to a decline in import penetration, which is projected to reach approximately 5 per cent in cumulative terms in the 2011-2013 period. However, this profile is more or less in line with the usual elasticity of imports *vis-à-vis* the import content-weighted overall demand developments, and therefore reflects the usual cyclical effect in a downturn.

Chart 5

## EVOLUTION OF EXTERNAL DEMAND, EXPORTS AND MARKET SHARE | ANNUAL AVERAGE RATE OF CHANGE IN PERCENTAGE



Sources: ECB, INE and Banco de Portugal.

Note: (p) – projected.

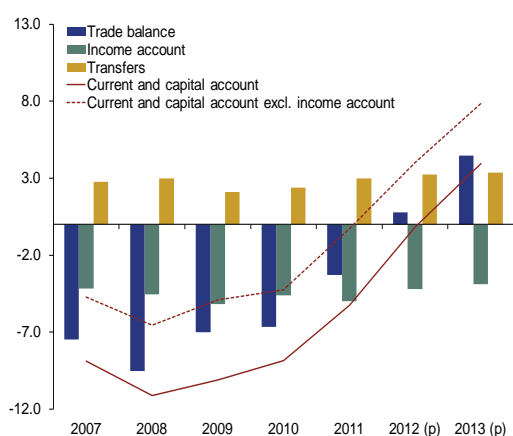
The Portuguese economy's external imbalance adjustment process is expected to continue in 2013, with a positive current and capital account balance of 4 per cent of GDP projected for that year, following a deficit of close to zero in 2012 (Chart 6). This largely reflects developments projected for the trade balance, which is expected to have a surplus of 4.5 per cent of GDP in 2013. The improvement in the trade balance reflects an increase in nominal exports as a percentage of GDP, in parallel with a virtual stabilisation of nominal imports as a percentage of GDP in 2012 and a reduction in 2013, in the context of a quite favourable terms-of-trade effect that year. The income account deficit is expected to decline over the projection horizon, from 4.2 per cent of GDP in 2012 to 3.9 per cent of GDP in 2013 (5 per cent of GDP in 2011), benefiting from the downward profile of short-term interest rates assumed in the current projection. The combined current transfers and capital account balance as a percentage of GDP should remain relatively stable over the projection horizon at approximately 3 per cent of GDP, close to the value recorded in 2011, partly as a reflection of the profile assumed for European Union transfers. The projected developments for external borrowing requirements imply a path identical to that observed in the context of economic stabilisation agreements with the International Monetary Fund (IMF) in the 1970s and 1980s (Chart 7). Current projections point to a more marked improvement in the current and capital account balance as a percentage of GDP than that considered in the previous *Economic Bulletin*.

With regard to the labour market, current projections point to a more marked cumulative reduction in employment in the 2012-2013 period than the corresponding decline in economic activity, as a result of a contraction of 3.8 per cent in 2012 and 1.8 per cent in 2013. The reduction in employment over the projection horizon extends to the public and private sectors, which in the first case reflects the assumptions considered as regards the evolution of the number of public sector employees.

Current projections imply less favourable developments in economic activity in 2013 than presented in the Summer edition of the *Economic Bulletin* (-1.6 p.p. revision of GDP growth), which result from a downward revision in all expenditure components, particularly private consumption and GFCF. This revision largely reflects the impact of fiscal consolidation measures announced for 2013, whose effect on economic agents' expectations is likely to affect their expenditure decisions as of the end of 2012. The

Chart 6

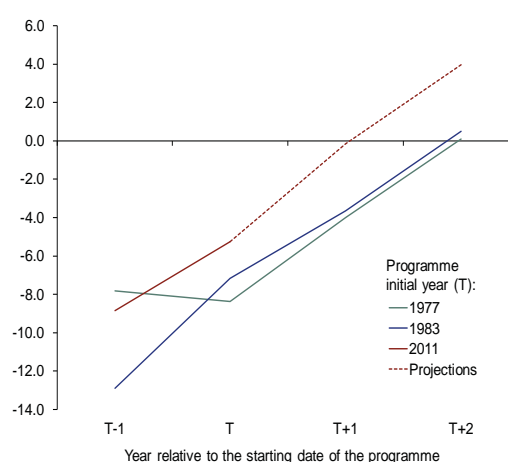
CURRENT AND CAPITAL ACCOUNT | AS A PERCENTAGE OF GDP



Sources: INE and Banco de Portugal.  
Note: (p) – projected.

Chart 7

DEVELOPMENTS IN EXTERNAL FINANCING REQUIREMENTS DURING FINANCIAL ASSISTANCE PROGRAMMES | AS A PERCENTAGE OF GDP



Sources: INE and Banco de Portugal.  
Note: As regards the 1977 and 1983 programmes, data refer to the current account.

projection for exports in 2013 implies a slight downward revision compared with the previous *Economic Bulletin*, against a background of less favourable assumptions for external demand growth in that year.

### **Reduction in inflation to around 1 per cent in a context of unwinding of fiscal measures and low growth of unit labour costs and import prices**

Inflation, as measured by the Harmonised Index of Consumer Prices (HICP), is expected to decline from 2.8 per cent in 2012 to 0.9 per cent in 2013 (3.6 per cent in 2011) (Chart 8). The deceleration projected for the HICP extends to the energy component (from 9.9 per cent in 2012 to 1 per cent in 2013) and to the non-energy component (from 1.7 per cent in 2012 to 0.9 per cent in 2013). Whereas for the energy component this profile reflects oil price assumptions, for the non-energy component it largely reflects the unwinding of the fiscal consolidation measures introduced in early 2012, in particular changes in VAT tax rates for some products. Hence, the contribution from indirect taxes to this component is likely to decline from around 2 p.p. in 2012 to close to nil in 2013. In 2013 consumer prices excluding energy should thus evolve more in line with their usual macroeconomic determinants. In particular, against a background of a deteriorating labour market situation, significant wage moderation should continue, translating into a virtual stagnation of private sector unit labour costs in that year. In addition, non-energy import price growth in 2013 is also expected to be relatively contained (1.1 per cent, following a 0.8 per cent reduction in 2012), in a context of a moderate rise in export prices of the main suppliers of the Portuguese economy and in non-energy commodities prices.

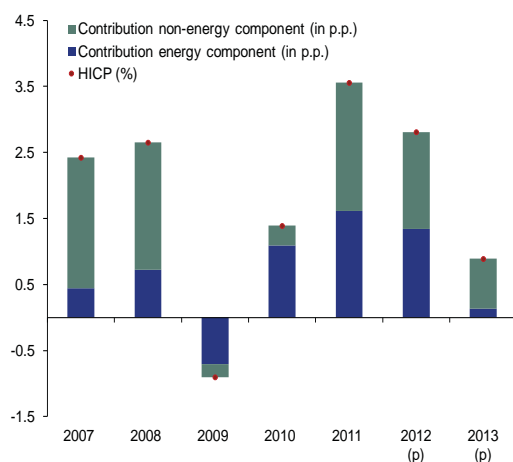
Compared with the Summer edition of the *Economic Bulletin*, the current projections for inflation imply an upward revision of 0.2 p.p. in 2012, reflecting to a large extent the incorporation of information for the third quarter of this year, which partly mirrored less favourable oil price developments in euros than assumed in previous projections. The projection for consumer price growth in 2013 remains virtually unchanged.

### **Risks of more unfavourable developments in economic activity and slightly on the downside for inflation**

Throughout the projection horizon persist risks associated with external and internal factors, which may lead to more unfavourable developments in economic activity. In particular, with regard to the

**Chart 8**

**INFLATION | CONTRIBUTION TO THE ANNUAL RATE OF CHANGE OF THE HICP**



**Sources:** Eurostat and Banco de Portugal.

**Note:** (p) – projected.

international environment, high uncertainty associated with the adjustment of structural imbalances in some economies, particularly in the euro area, amid difficulties to bring the sovereign debt crisis to conclusion, is likely to continue to affect economic agents' investment decisions and international trade flows, with a potential impact on Portuguese exports. Against this background, the possibility of a lower persistence or non-materialisation of market share gains assumed over the projection horizon also poses a risk to current projections. At the domestic level, the increase in the number of agents subject to liquidity constraints, within a framework of declining disposable income and worsening labour market conditions, and the uncertainty regarding the domestic and external environment, which may encourage precautionary savings, may to a larger extent restrain the capacity of households to smooth consumption. Hence, private consumption may decline more sharply than considered in the central scenario.

Risks to inflation are slightly on the downside, reflecting the downward pressure on prices from more unfavourable developments in economic activity, partly offset by the possibility of a sharper depreciation of the euro in nominal effective terms, given the external risks already mentioned.

## THE IMPORTANCE OF INSTITUTIONAL COOPERATION AND SOCIAL CAPITAL IN ECONOMIC ADJUSTMENT PROCESSES

The social and institutional environment is a core component of economic development as it fuels the productive impact of the physical capital, skill level of the working population and accumulation of technical and organisational knowledge. However, the mere transposition to a given economy of institutional frameworks that have been successful in other economies is not, in itself, a guarantee of success (Rodrik, 2008). Institutional innovations must always fit the existing social capital so as to encourage effective ownership by economic and social agents.

Social capital entails all institutional aspects of the social organisation (e.g. trust between agents, existing norms and social networks) that make it possible to enhance efficiency through a better coordination of the decision-making processes (Putnam, 1993). Institutional frameworks set limits on the behaviour and relationship patterns of economic agents, thus defining the economy's equilibrium. These frameworks include the laws sustaining the rule of law and guaranteeing property rights, but also those defining political institutions and the interaction between social partners. These institutions form the model for democratic governance in society and on their effectiveness hinges the accumulation of social capital, the main catalyst for strong institutional cooperation.

However, these institutional frameworks may prove to be sub-optimal whenever the established economic equilibria are jeopardised. The most frequent reason for this disruption is technological progress, which takes the form of the introduction of new products and/or production management techniques, triggering creative destruction processes. The technological shocks that have put an end to the Taylorist management practices are an example of such transformations. But there are other reasons that may lead to changes in the functioning of economies, such as changes to social paradigms, e.g. the increasing female participation in the labour market, or geopolitical changes, such as economic globalisation or the increase in migration flows. If (previously adequate) institutions do not reform and adapt to political and social developments, there may be a severe deterioration in economic conditions and a permanent economic decline in countries or regions. Society's success in responding to this constant shift depends on its capacity to structurally transform its institutions.

Reform processes are periods of creation of new social capital. Whenever social capital is misaligned, a new institutional consensus must be sought. This consensus should be legitimised and owned by economic and social agents, in the context of prevailing institutions and using the existing social capital. If trust between agents, existing norms and social networks are flexible enough, institutions will endogenously generate their own reform. This is the case with horizontal power relationships, where social partners share the same level of responsibilities and institutions promote social capital and a wide participation in decision making (Putnam, 1993). In a different conceptual framework, we may refer to these institutions as inclusive, as defined by Acemoglu and Robinson (2012). These institutions foster society's adaptation to technological shocks, by promoting creative destruction processes. Laws establishing compulsory education are the best example of an inclusive institution, which fosters the adaptability of the labour factor to technological changes and, in that process, includes all society on an equal footing. In contrast, societies characterised by extractive institutions, which oppose the self-regeneration process, rely on vertical power structures and tend to impoverish due to their difficulties in responding to incoming shocks.

The response to structural reform challenges crucially depends, therefore, on the quality of social capital and its ability to general adequate levels of institutional cooperation. This cooperation is essential in economic adjustment processes and the most important aspect of social capital during these periods is the trust relationship formed between agents. As stated by Kenneth Arrow in 1972: "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over

a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence”.

In the course of structural reform processes, social capital must be revived and the best way to do it is by using it. Social capital increases with its use (unlike most private assets). Therefore, the use of rules and norms that form the institutional framework of a country generates virtuous circles of social capital revitalisation. In contrast, its conversion into an inert state destroys it and generates vicious circles of permanent depreciation.

Structural reforms arise naturally and almost permanently when social capital is revitalised, based on inclusive institutions. By contrast, in societies characterised by extractive institutions, reforms tend to trigger economic implosions and disruptions – always rather abrupt – in the existing paradigm. In fact, a society able to face changes is constantly monitoring the optimality of its institutional framework. These reform processes should generate two dynamics: the first, a social capital production dynamic that puts economic and social agents at the centre of the legislative process; the second, which is closely linked to social capital production, regards its ownership. The latter is essential for a consensus around reforms to be adopted in such a way that the recipients of reforms, upon understanding their usefulness, will actively participate in their implementation (Rodrik, 2008).

One of the main consequences of this view of the organisation of societies is that the success of structural adjustment processes hinges on domestic conditions and the recognition of the systemic nature of institutions. The network of relationships formed between the various economic and social agents is rather dense and, as such, changes to the institutional framework with an impact on these relationships must be introduced amid intense institutional cooperation, by creating new institutions where necessary to strengthen the governance model (Rodrik, 2000). Accordingly, interactions between the various reforms are of relevance. At times, these reforms reinforce each other, but in other contexts they may be at odds with each other. A coherent and systematic implementation of measures is, therefore, crucial (Rodrik, 2008).

The difficulty in obtaining cooperative solutions is far from a sign of irrationality on the part of agents and necessarily reflects distortions in incentives, inefficient institutions or low social capital levels. For instance, high levels of civic participation and interaction determine high social capital levels. Voluntary cooperation is always simpler in a society relying on relationship and reciprocity rules between agents and on the creation of instruments for social involvement and preservation of institutions in which they interact (Putnam, 1993 and Fukuyama, 1995).

The dynamic vision that results from these features of social capital is that it is not a static factor. Choices made by agents in terms of use of social capital generate, per se, two opposing trends. An active use of the existing capital tends to be progressive, contributing to its accumulation and regeneration; by contrast, if social capital is not a vehicle for the reform of the existing institutional framework, it generates a regressive trend that depreciates the existing capital and, eventually, may render it ineffective.

### ***The management of adjustment processes: the role of social capital***

The quality of social capital was decisive for the success of adjustment processes in several European countries. European experience in the implementation and management of structural adjustment processes exemplifies the relevant role played by social capital. In these cases, it became clear how social capital – social norms and rules – and the high degree of use of available institutional mechanisms made it possible to obtain a consensus defined and owned by agents. The cases described below are examples of the self-regeneration of social capital in times of economic crisis and of the role of horizontal and inclusive nature of institutions for the success of reforms.

The importance of the management of adjustment processes can be accounted for by the systemic nature and the need to reconcile agents' preferences that are often conflicting (Freeman et al., 1997). In the



European countries that have most successfully undergone adjustment processes several forms of social capital can be identified (e.g. the Netherlands in the early 1980s (Jong, 1999, Visser and Hemerijck, 1997, Wellink, 1997), Sweden in the early 1990s (Freeman *et al.*, 1997, Gylfason *et al.*, 2010) and Germany at the beginning of the 21st century (Jacobi and Kluwe, 2007)). The absence of social capital is also the reason behind the failure in developing southern Italy, when compared with the economic success of northern and central Italy (Putnam, 1993).

During the 1970s, there was some macroeconomic imbalance in the Netherlands related to the discovery of natural resources, which became known in literature as the “Dutch disease”<sup>1</sup> (Jong, 1999). The impact of the discovery of energy resources on wage growth determined a real appreciation and the consequent deterioration in competitiveness and corporate profitability conditions. At the same time, the adoption of an expansionary fiscal policy culminated in a structural fiscal imbalance, jeopardising the social protection system in an environment of rising unemployment. During this period, the non-cooperative characteristics of the negotiating framework were sustained by an economic policy that accommodated deadlocks in negotiations, which resulted in job losses and an irreversible deterioration in the economic situation. Perceptions about these difficulties were crucial for the creation of incentives to changes in the interaction between agents (Visser and Hemerijck, 1997, Wellink, 1997). The metamorphosis experienced by these institutions was based on the Wassenaar arrangement, consisting of an institutional cooperation model (the so-called “Polder model”), which was the benchmark for subsequent social arrangements in other European countries. This arrangement exemplifies a consensus building – legitimacy – appropriation process, which should be behind sustainable changes to a country’s social capital.

The Wassenaar arrangement, signed between employers’ and trade union representatives in 1982, was aimed at stopping the inflationary spiral, stemming from excessive wage increases jeopardising employment. This arrangement benefited from the strong social capital acquired by Dutch society, particularly in the period following World War II, when reconstruction efforts meant that social agents had to work together. The Polder model relied on strong consensus-building around measures between social partners and the Government within the Social Economic Council and made it possible to implement a comprehensive set of reforms in an environment of social consensus. The Dutch parliamentary framework, where it is virtually impossible to produce one-party majorities, requires the existence of parliamentary coalitions, which entails a systematic cooperation between political forces and the prevention of purely ideological deadlocks. Moreover, the participation of institutions with strong analytical skills and technical advice ability has also played a key role (e.g. the Central Planning Bureau).

The Netherlands has implemented a comprehensive set of reforms, amid wide institutional cooperation, which have made it possible to maintain the foundations of the welfare state and, at the same time, to reform markets functioning and revive economic and employment growth. Labour market reforms were adopted, marked by a reduction in working hours and wages as well as decentralised wage bargaining, which fostered the creation of employment. Moreover, a privatisation and public expenditure-reducing plan was adopted, together with a reduction in the tax burden and social contributions. These reforms made it possible to rebalance the general government accounts and restore competitiveness conditions without, however, leading to the destruction of the welfare state.

Yet another example of adjustment process where institutional cooperation played a key role is the Nordic crisis in the early 1990s, triggered by the financial liberalisation process, whose impact was not mitigated by an adequate stabilisation policy (Gylfason *et al.*, 2010). The features of the crisis diverged in Sweden and Finland; however, the solution to the crisis relied in both cases on a major cooperative effort between social partners.

<sup>1</sup> The term was coined in 1977 by the magazine *The Economist* to describe the fall in the Dutch tradable goods sector following the discovery of a large gas field in 1959. The structural consequences of an increase in a country’s wealth were studied in Corden and Neary (1982).

The Nordic countries have adopted very similar institutional models, which were inspired by the Dutch Polder model and relied on a fruitful tripartite cooperation between employers' associations, trade unions and the Government. This institutional framework was the basis for the Nordic social model, with relevant risk-sharing and social solidarity mechanisms. The Nordic model combines a comprehensive welfare state, with a minimal market regulation and a key role of social dialogue, by opposition to legal restrictions in what respects labour market regulation. Therefore, despite differences in the features of the crisis, the adjustment process relied, in both Sweden and Finland, on a deep commitment among those involved, in order to maintain the risk-sharing mechanisms that are behind the social contract in the Nordic countries and strengthen their welfare state (Freeman, 1995).

In the case of the Swedish economy, the onset of the crisis resulted from a sudden adjustment in asset prices (particularly real estate prices, which had increased substantially throughout the 1980s). The subsequent fiscal crisis led to a collapse in institutions on which the welfare state depended and that had been designed for a different economic environment (Freeman *et al.* 1997). Sweden was confronted with the need to rescale its welfare state.

The Swedish social contract relies on the elimination of poverty and a high employment rate, sustained by a welfare state capable of efficiently providing public services that are valued by society. Similarly to the Netherlands, tax reforms were implemented, with the purpose of reducing tax system complexity and fostering greater uniformity in taxation, widening the tax base and changing incentives to labour supply and savings. Moreover, fiscal consolidation measures were adopted, aimed at cutting social expenditure and increasing the link between the benefits entitlement and the obligation to participate in the labour market.

The third example of an adjustment process under analysis is the German experience. The example is relevant not only due to the success of the labour market adjustment process but mainly because it embodies the role of the direct relationship between companies and workers – through works councils. The process whereby the functions of works councils are established is particularly noteworthy. As shown in Freeman and Lazear (1995), employers give works councils less power than is socially desirable. In turn, workers tend to give works councils too much power. As such, the proper set of tasks should be regulated exogenously. However, according to Freeman and Lazear (1995), works councils are also opposed by trade unions, which regard them as competitors in terms of social and corporate dialogue representativeness. This can only be changed via appropriate legislation and solutions that foster cooperation among agents so that they may understand the virtues of a decentralised social representation model. Works councils may lead to greater confidence among social partners at corporate level, facilitating adjustments to firm-specific shocks.

Over the past few years, Germany has implemented a range of economic reforms focused on the labour market, with the purpose of enhancing coherent interlinks between active and passive labour market policies and to render the use of temporary employment contracts more efficient. This process would not have been as successful had the network of social connections been less wide. Over several decades, the existence of works councils has cemented intra-firm confidence and reciprocity and made it possible to implement risk-sharing mechanisms linked to employment and wages, which, if unavailable, would have rendered impossible changes introduced in the successive Hartz reforms between January 2003 and January 2005. The German labour market is characterised by great flexibility in terms of working hours, as opposed to high flexibility in the number of jobs, which is more typical of the United States (Houseman and Abraham, 1995). This feature of the German labour market is supported by unemployment benefit legislation that privileges the maintenance of employment relationships with firms and, consequently, a strong attachment to work, in contrast to an externalisation of unemployment phenomena. The 2003-2005 reforms enhanced this feature of the German labour market and strengthened the German corporate and vocational training model links, which are a success factor and have helped to maintain technological leadership in a number of industrial sectors.

The European experience illustrates two key factors in the management of economic adjustment processes: conditions at the outset in terms of social capital are crucial, but the success of these processes mainly hinges on a permanent review of existing equilibria. Given the challenges ahead, these countries create new institutional responses, using existing social capital and generating virtuous revitalisation circles. Institutional disruption processes are characteristic of societies with vertical power relationships and a social organisation that does not promote the participation of all agents in the search for solutions. Reinforcing trust and making good use of existing norms and social relationships is, by contrast, the road to take in the establishment of structural reforms in Portugal.

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This article is basically run along three lines. First, the monetary policy transmission mechanism in the euro area is explained in a context of normal financial market functioning. Subsequently, there is a characterisation of monetary policy transmission problems over the most recent period, which was severely affected by the 2008 financial crisis and the sovereign debt crisis in the euro area. Finally, this article sets out some of the non-standard monetary policy mechanisms used by the European Central Bank (ECB) to minimise monetary policy transmission problems.

### 1. Normal functioning of financial markets

First of all, it is important to understand that monetary policy and its transmission mechanism to the real economy have been the subject of academic and institutional debate and, therefore, rather varied perspectives persist regarding the impact of monetary policy decisions on prices and the economy. The ECB's primary mandate is to ensure price stability in the euro area in the medium term. For that purpose, the ECB has several monetary policy instruments in place, such as short-term interest rates in its dealing with banks and the open-market purchase of debt securities. Secondly, the ECB is responsible for supporting the EU general economic policies.

In normal times, the monetary policy functions both via transactions between the ECB and banks in periodic liquidity tenders conducted by the ECB and interbank transactions during the period between tender procedures. Main refinancing operations (MROs) are weekly tender procedures where the ECB grants loans to banks (which must be repaid in the following week) with an interest rate fixed by the Governing Council, against collateral. This liquidity is injected into banks' balance sheets, which negotiate new short-term loans with each other depending on whether they need liquidity or have excess liquidity. These liquidity fluctuations in each bank depend on idiosyncratic operations: for instance, repayments of bigger-than-expected loans will result in excess liquidity; applications for bigger-than-expected loans will lead to liquidity shortages. Moreover, some banks do not access MROs directly, as they prefer to get their funds from banks that do.

In addition to these short-term operations, the ECB also has longer-term refinancing operations (LTROs) in place, which are typically conducted on a monthly basis and have a three-month maturity. However, these operations diverge from MROs to the extent that the ECB acts passively in the market as regards prices (i.e. it supplies liquidity while trying not to affect market rates), except under exceptional circumstances.

The short-term interbank money market described above is particularly important as it is the first building block of the monetary policy transmission mechanism. Interest rates in this market depend on the interest rates on previous MROs, expectations about the rate on future MROs, and the outlook for economic activity. While trading in these very short-term operations, financial intermediaries also conduct longer-term and wider scope transactions, namely with non-banks. In particular, banks grant loans to households and enterprises; take deposits; participate in banking syndicates for the financing of long-term projects; and trade with other financial intermediaries (hedge funds, investment banks). When performing this activity, banks take into account not only the risks associated with operations per se but also longer-term expectations signalled through MROs and other refinancing operations with somewhat longer maturities. To sum up, market participants progressively incorporate the monetary policy stance favoured by the ECB in their actions. They do this through short-term refinancing operations and the transmission of prices

charged in those operations (adjusted by risk weightings and duration) to other types of operations and maturities, as well as other financial intermediaries and economic agents.

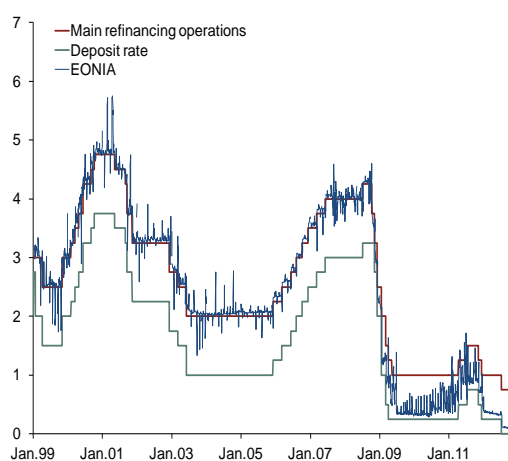
Chart 1 shows developments in the MRO rate for the period between January 1999 and September 2007 and the EONIA (euro overnight index average),<sup>1</sup> which is an average interest rate on non-collateralised operations with a one-day maturity between euro area banks. Excluding, for now, the period after mid-October 2008, it can be seen that the EONIA rate fluctuated around the interest rate on MROs, which is the reference interest rate. During this period, liquidity was supplied by the ECB through tender procedures with pre-announced amounts, calculated so that liquidity to market liquidity would remain balanced and, consequently, that interest rates in the tender procedure would be close to the reference interest rate.

When liquidity and maturity premia in these markets are stable, monetary policy instruments have a powerful influence on the economy. The level of prices is influenced both by interest rates passed on by the financial system to the economy and expectations in output and labour markets.<sup>2</sup>

One issue is whether it is possible to predict the macroeconomic effects of a given monetary policy decision. Chart 2 presents a sum of such effects using a dynamic general equilibrium model for the euro area and the rest of the world.<sup>3</sup> The left-hand panel shows developments in the three-month interest rate as a direct result of a temporary shock on central bank interest rates and through the above-mentioned transmission mechanism. Initially, the short-term interest rate drops by 25 basis points, and slowly returns to the initial value. The right-hand panel shows the result predicted by the model stemming from that monetary policy movement. Real output initially increases, up to a peak 0.65 per cent above the initial level, but afterwards it drops. Inflation behaves similarly, rising by around 47 basis points a few quarters

**Chart 1**

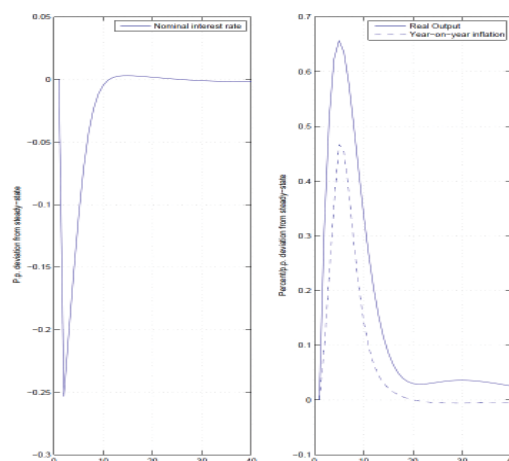
**DEVELOPMENTS IN REFERENCE INTEREST RATES AND THE EONIA | PER CENT**



Sources: ECB and Bloomberg.

**Chart 2**

**RESPONSE OF REAL OUTPUT AND INFLATION TO A MONETARY POLICY SHOCK IN A DYNAMIC GENERAL EQUILIBRIUM MODEL**



Source: Banco de Portugal calculations.

- 1 In this respect, see Rodrigues, P. and Soares, C. (2011), Determinants of the EONIA and the financial crisis, Banco de Portugal, Working Paper No 12.
- 2 There are other channels, such as changes in exchange rates, which may directly affect the level of prices. For more details on the functioning of the monetary policy transmission mechanism in the euro area, see <http://www.ecb.europa.eu/mopo/html/index.en.html>.
- 3 More specifically, this is a Keynesian large-scale dynamic general equilibrium model. The model makes it possible to characterise realistically the short-term macroeconomic adjustment to monetary shocks (inter alia) and includes, namely, adjustment costs on investment and price and wage rigidity. For more details, see Gomes, S., Jacquinot, P. and Pisani, M. (2010) "The EAGLE: A model for policy analysis of macroeconomic interdependence in the euro area", ECB, Working Paper No 1195, as well as the references in this paper.

after changes to the interest rate, and later falls to the initial level. Therefore, this policy has an expansionary effect on output but, at the same time, it increases inflation (in both cases, only temporarily).

What can happen if, for some reason, confidence in the interbank money market deteriorates, *i.e.*, if banks fear that their counterparties will not be able to repay loans, as seen particularly in October 2008?

## 2. Malfunctioning of financial markets

### 2.1. Liquidity in the interbank money market

The interbank money market (in general, a short-term non-collateralised market) is particularly sensitive to phenomena that may affect banks' credibility. Any development in financial markets undermining interbank confidence may have nefarious consequences for the monetary policy transmission mechanism and, in particular, may paralyse interbank money markets. In these circumstances, interbank money markets are hampered and many banks are forced to obtain direct funding from the central bank, which may become the sole liquidity supplier in the economy. This mechanism for the transmission of central bank monetary policy is severely affected given that banks do not engage in intertemporal arbitrage as needed for liquidity to reach the various financial intermediaries. Rather, as a consequence of increased risk aversion, banks tend to retain large amounts of liquidity as a way to respond to sudden demands. In more serious cases, banks will be forced to adjust their balance sheets, through the sale of assets and a squeeze on credit.

The ECB has responded to problems stemming from the international financial crisis using a number of instruments.<sup>4</sup> As soon as mid-October 2008, following the collapse of the investment bank Lehman Brothers, the ECB started to supply unlimited amounts of liquidity at a fixed rate, *i.e.* all liquidity bids in MROs were satisfied, provided that they were properly collateralised. At the same time, the ECB also widened the pool of eligible collateral for refinancing operations, which facilitated direct access to these operations by a greater number of institutions and to greater amounts. Chart 1 illustrates the consequences of these decisions. As previously mentioned, banks with access to MROs accumulated large liquidity reserves for precautionary reasons, which were eventually deposited with the ECB at the overnight deposit facility rate, also shown in Chart 1. Any short-term liquidity demand of a bank that, due to its reputation, continued to have access to the interbank money market, was remunerated at the ECB deposit facility rate plus the credit and liquidity risk premia.

Moreover, the ECB extended its activities to operations with longer maturities through LTROs, which consist in the supply of liquidity, properly collateralised, with six-month, one-year or (more recently) three-year maturities. This mechanism makes it possible to ease liquidity restrictions of the banking system and prevent a sudden readjustment of the balance sheet; however, in itself, it does not imply that banks disseminate liquidity into the economy.

In June 2009 a covered bond purchase programme was launched, and in May 2010 a further programme for the purchase of debt securities was started, *i.e.* the Securities Markets Programme (SMP). The goal of both programmes was to ensure the correct monetary policy transmission through the normalisation of the debt market. In the case of the SMP, this was a programme for the purchase of public or private debt securities, generally held until maturity, as a way to activate specific market segments and supply liquidity to the economy. This programme was cancelled in September 2012, in parallel to the announcement of the Outright Monetary Transactions (OMT) programme, as described later.

<sup>4</sup> For more details on these and other non-standard policies, see Box 1.2 "Non-standard monetary policy in major advanced economies", in this Bulletin.

## 2.2 Sovereign debt

In the case of a monetary union encompassing several sovereign debt issuers, such as the euro area, another type of malfunctioning may occur in the markets. In addition to loss of interbank confidence, it is possible that doubts also arise regarding the solvency of sovereigns. In this case, in addition to the bank's idiosyncratic risk there is a risk associated with the country where the bank operates. In practice, the connection between country risk and bank risk is very strong, for multiple reasons. Firstly, the implied guarantee provided by the sovereign to the financial system, in terms of both deposit insurance and the possible need to bail out systemically important banks, is a powerful connection between the sovereign and the financial system. Secondly, most banks are primarily active in their country of origin and, therefore, economic expectations for that country, influenced inter alia by fiscal policy, directly affect banks' profitability prospects via their lending activities. Thirdly, investors tend to exhibit a so-called home bias, i.e. a preference for securities of their country of origin, including sovereign debt; this generates a correlation between the value of banks and the performance of securities held. A fourth reason relates to the fact that, amid great uncertainty, international investors prefer to settle positions in countries experiencing some instability that may affect their financial institutions. Given that this impacts simultaneously on several financial institutions, country risk is systemic and is even more destructive than idiosyncratic risk because its scope is wider. Should any doubts persist on a country's capacity to remain in the euro area, banks in that country will face many difficulties in obtaining financing from international banks, which also affects their ability to obtain Eurosystem financing, given that their collateral often comprises sovereign debt securities. This deteriorates the country's economic situation, given that banks find it difficult to fulfil their task as liquidity providers to the economy. What to do in those situations?

## 3. Alternative equilibria and non-standard monetary policy operations

As seen above, panic in the sovereign debt securities market in a monetary union may, under certain circumstances, be positively reinforced. The question arises whether it is possible or desirable to intervene in those markets so as to correct any phenomenon stemming from fears not based on hard data concerning the economy in question. Recent literature suggests that markets are very sensitive to differences in the basic parameters of economies. For instance, Catão, Fostel and Rancière (2012) show that, in a theoretical model with constantly revised rational expectations, where the sovereign debt market is modelled as a game between debtors with privileged information on the state of the country and international investors neutral towards risk, two types of equilibria may emerge.<sup>5</sup> In the first case, the market does not penalise countries with poorer economic fundamentals, instead it treats the various countries equally. This is a "pooling equilibrium", where countries under stress make the necessary decisions so as not to default when debt matures. In the other case, the market severely penalises any indication of, for instance, falls in tax revenues, which makes a default of the country even more likely. This is a "separating equilibrium". Most interesting in this result is that this may happen due to negligible differences between countries (and, theoretically, even for countries that are precisely alike), all depending on the initial expectations and strategies (according to rational assumptions) on the part of both creditors and debtors.

In the case of a separating equilibrium, the monetary policy transmission mechanism becomes inoperative. Chart 3 represents the time fixed effects of a regression in an 11-country panel in the euro area, weighted by each economy's GDP, where the dependent variable is the average interest rate of each country in loans to non-financial corporations.<sup>6</sup> In addition to time fixed effects, the regression also includes a number of variables that may help explain this interest rate, such as banks' cost of funds and macroeconomic development indicators for each country. In particular, explanatory variables, at country

<sup>5</sup> Catão, Fostel and Rancière (2012), *Fiscal Discoveries, Stops and Defaults*, IMF, Working Paper.

<sup>6</sup> The within estimator of panels was used.



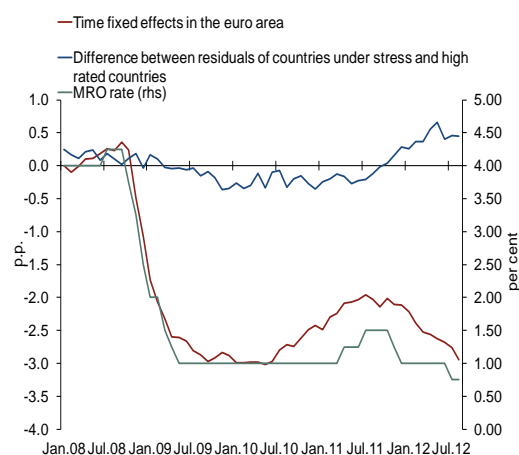
level, are the average premium paid on credit default swaps (CDSs) for a number of domestic banks, the expected GDP growth rate in the following year, and the logarithm for the amount of liquidity used by banks in LTROs. In order to eliminate systematic differences between countries, fixed effects per country were also taken into account.

Time fixed effects may be interpreted as the average level of interest rates on loans to non-financial corporations in the euro area as a whole, normalised to zero in January 2008 and adjusted for both the effects of variables that may reasonably affect these interest rates and persistent differences between countries. It can be seen that, between early 2008 and the end of the sample, interest rates on loans to enterprises in the euro area were in line with developments in the MRO rate. However, these rates' behaviour varied significantly across countries, even adjusting for the effects on these interest rates of the above-mentioned variables. In fact, Chart 3 also illustrates the difference between the average of estimated residual amounts for Greece, Ireland, Italy, Portugal and Spain, and the average of residual amounts for the remaining high-rated countries. In a context of smooth functioning of the monetary policy transmission mechanism, these residual amounts would be expected to hover around zero. Instead, the difference in these operations across high-rated countries and countries whose sovereign debt is under stress increased. This result suggests the onset of a separating equilibrium, which contrasts with a previous pooling equilibrium.

However, central banks may influence agents' expectations and strategies and try to restore the monetary policy transmission mechanism when a separating equilibrium prevails. Chart 4 shows an example of how the ECB has the power to change equilibria in financial markets by affecting economic agents' expectations and strategies. This chart shows the yield curves for sovereign debt securities of three euro area countries, namely Portugal, Spain and Germany, in two different moments. Dotted yield curves refer to 25 July 2012, the eve of the day when the President of the ECB announced in London that "within our mandate, the ECB is ready to do whatever it takes to preserve the euro".<sup>7</sup> Following this speech,

**Chart 3**

**RESULTS OF THE PANEL REGRESSION FOR THE INTEREST ON LOANS TO NON FINANCIAL CORPORATIONS**

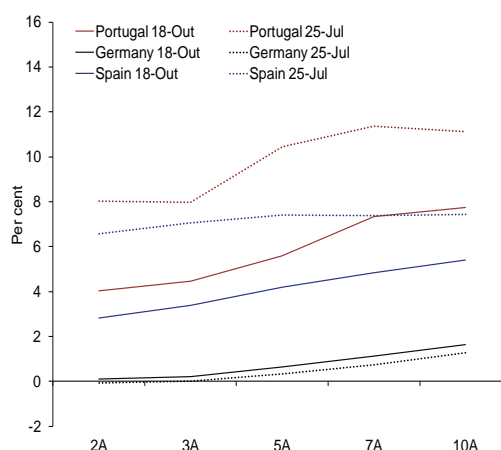


**Sources:** Consensus Forecasts, ECB, Thomson Reuters, and Banco de Portugal calculations.

**Note:** Countries under stress: Greece, Italy, Ireland, Portugal and Spain; high-rated countries: Austria, Belgium, Germany, France, Finland and Netherlands.

**Chart 4**

**SOVEREIGN DEBT SECURITIES YIELD CURVE**



**Source:** Thomson Reuters.

<sup>7</sup> See President Draghi's speech on 26 July 2012 at <http://www.ecb.int/press/key/date/2012/html/sp120726.en.html>.

yields on sovereign debt securities of countries under stress edged down, with no comparable change in the fundamentals of those economies; in particular, the Spanish and Portuguese debt yield curves, represented by the solid line in the chart, would drop by around 4 p.p. in the period up to 18 October 2012. Although other factors may be involved, these words, later on culminating in the announcement of the OMTs, may have substantially reduced market perceptions about redenomination risks.

One way for the ECB to promote investors' expectations and strategies that support equilibria while not feeding back panic is to intervene directly in the relevant markets. As previously mentioned, in 2008, 2009 and 2010 a number of initiatives in this field were launched. Due to an acceleration in the sovereign debt crisis in several euro area countries and the possible contagion to other countries, it became necessary to design a market intervention programme powerful enough to influence investors' expectations and strategies. This was the main reason behind the Outright Monetary Transactions (OMTs), which consist in the purchase of sovereign debt securities for certain maturities (typically between one and three years) and countries. In this case, however, the issue involves a moral hazard problem: when the ECB intervenes in the debt market of a given country to restore the monetary policy transmission mechanism, the incentives for that country's decision-makers to act according to what is expected in a pooling equilibrium, (i.e. bearing with the necessary constraints to repay debt) decline. In order to eliminate this problem, the country in question must meet certain conditions – more precisely, it must agree to follow a given externally supervised macroeconomic adjustment programme – in order to benefit from the ECB's market interventions, and the adjustment programme must be fulfilled in a satisfactory manner (see Box 1.2 "Non-standard monetary policy in major advanced economies", in this Bulletin). If investors believe that the pooling equilibrium may be sustained by including countries under stress, market prices regarding that debt will only reflect the overall state of those economies and will not be contaminated by panic or redenomination fears.

The issue of OMTs as an equilibrium selection mechanism and consequent resumption of the monetary policy transmission mechanism raises the further issue of determining the sovereign debt yield adjusted to the economic fundamentals of each country, which will also influence the level of intervention by the ECB. The problem with the calculation of this rate is complex and should involve several alternative methodologies. For instance, it is possible to estimate a statistical model that takes into account not only expectations about developments in some key macroeconomic variables but also explicitly considers the fact that a pooling or separating equilibrium may prevail in that moment. This would make it possible to simulate, whenever there is a separating equilibrium, the value of the sovereign debt yield if there were a pooling equilibrium.

With a view to illustrating this methodology, a monthly unbalanced panel was used, comprising ten euro area countries, between January 1999 and July 2012. The dependent variable is the two-year sovereign debt yield, explained in the model using relevant quantities, including changes in the consumer price index by country, equity market volatility in the euro area, the real short-term interest rate in the euro area, and expectations about the level of public debt over a one-year horizon, per country. It includes fixed effects per country and a variable identifying those periods that are considered to correspond to a separating equilibrium. This variable was obtained taking into account the maximum difference between yields on Treasury bills in the euro area, given that historically this type of securities is rarely affected by sovereign defaults. Above a certain value,<sup>8</sup> there is considered to be an actual separation between countries, which means that this is a separating equilibrium; otherwise, it is considered to be a pooling equilibrium. The simple average of yields across the entire sample is 3.36 per cent for countries under sovereign debt stress (in this case, Portugal, Ireland, Italy and Spain) and 2.74 per cent for high-rated countries (Germany, Austria, Belgium, Finland, France and the Netherlands). In countries with a pooling equilibrium, the difference between yields in these two groups of countries was only 18 b.p. At

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<sup>8</sup> In this example, this value was 200 b.p.

the end of the sample, at a time of sovereign debt crisis and a separating equilibrium according to the previously adopted criterion, there is a 4.67 p.p. difference between both groups of countries. Taking into account the fundamental characteristics of those economies used in the model and simulating the case of a pooling equilibrium, there is, on average, a 38 b.p. difference between both groups of countries. Although these figures are analysed for illustrative purposes alone and may hide significant heterogeneity across countries, they suggest that, considering fundamental data on economies, the equilibrium may be consistent with much lower spreads between yields on public debt in various euro area countries than those recently observed.

Differences between yields on public debt in the various countries are expectable, given that, overall, the fundamentals of economies differ amongst themselves. Although merely for illustration purposes, this approach incorporates the key elements for a measurement of the interest rate on public debt adjusted to economic fundamentals, including: a notion of the type of equilibrium in the economy; a series of objective indicators for the country; and the incorporation of unobserved factors that may be relevant for the persistent differences across countries.

#### **4. An effective mechanism?**

The issue of whether there is a set of standard or non-standard instruments that guarantee the resumption of the ECB monetary policy transmission mechanism to the euro area economy is difficult. For the mechanism to work, it is necessary that at least two conditions are observed. Firstly, that this macroeconomic and fiscal juncture in each country does not raise founded mistrust among investors as to the country's capacity to service debt. Secondly, that banks are not affected by that mistrust and may access interbank markets, provided that they are adequately capitalised. The above-mentioned standard and non-standard instruments may help to meet these requirements and, in particular, help allay investors' mistrust as to how willing countries under stress are to implement their adjustment programmes. This implementation is crucial in order to sustain a pooling equilibrium.



## ARTICLES



MEASURING COMPETITION IN THE PORTUGUESE ECONOMY  
USING PROFIT ELASTICITIES

AN EVALUATION OF GOVERNMENT EXPENDITURES'  
EXTERNALITIES

PRODUCT SWITCHING OR RE-CLASSIFICATION? AN  
APPLICATION TO PORTUGUESE INTERNATIONAL TRADE

SHORT-TERM FORECASTING FOR THE PORTUGUESE ECONOMY:  
A METHODOLOGICAL OVERVIEW



# MEASURING COMPETITION IN THE PORTUGUESE ECONOMY USING PROFIT ELASTICITIES\*

João Amador\*\* | Ana Cristina Soares\*\*

## ABSTRACT

This article takes the set of Portuguese markets and computes a new competition measure suggested by Boone (2008), which draws on the concept of profit elasticity to marginal costs in a given market. The article concludes that the majority of markets presented a reduction in competition in the period 2000-2009, though there is substantial heterogeneity. In addition, markets that faced competition reductions represent the large majority of sales, gross value added and employment in the Portuguese economy. The non-tradable sector presents lower competition intensity than the tradable sector. Moreover, reductions in competition are relatively widespread across markets in both sectors, but in terms of sales, gross value added and employment these reductions are more substantial in the non-tradable sector.

## 1. Introduction

Economic growth is driven by the adoption of new technologies and the emergence of new products, which replace old ones. In the Schumpeterian terminology this dynamics is commonly known as *creative destruction*. Competition plays an extremely relevant role in this dynamics. Nevertheless, the paradigm of perfect competition, with prices equalling marginal costs and zero economic profits in the long-run, is almost non-observable in reality. Instead, firms tend to have some degree of market power, *i.e.*, they are able to set and sustain positive mark-ups. Therefore, competition measures are important policy indicators. The new competition measure suggested by Boone (2008) is particularly suited to assess competition in a context of reallocation of resources in the economy.

This article computes the measure of profit elasticity to marginal costs in the Portuguese markets suggested by Boone (2008), based on firm level data from Central de Balanços for 2000-2004 and Informação Empresarial Simplificada for 2005-2009. The article reports profit elasticity levels and trends for the different markets. In addition, this analysis complements and assesses the robustness of the results included in Amador and Soares (2012a), which focuses on the set of classical competition indicators for the Portuguese economy.

The analysis carried out is fundamentally distinct from the one conducted by competition authorities, aiming to set an overall scenario for competition developments and not to draw conclusions for individual markets. As in Amador and Soares (2012a), the distinction between tradable and non-tradable and manufacturing and non-manufacturing sectors is highlighted. In fact, it is important to assess whether there is margin for an increase in competition in the Portuguese economy, particularly in the non-tradable sector. In this case, an increase in competition would contribute to a more efficient alloca-

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tion of resources, favouring the correction of existing macroeconomic imbalances. The article concludes that the majority of markets presented a reduction in competition in the period 2000-2009, though there is substantial heterogeneity. In addition, markets that faced reductions in competition account for the large majority of sales, gross value added and employment in the Portuguese economy. The non-tradable sector presents lower levels of competition than the tradable sector. Moreover, reductions in competition are widespread across markets in both sectors but, in terms of sales, gross value added or employment, competition reductions are more substantial in the non-tradable sector.

From a competition policy point of view, it is important to select indicators that can unequivocally identify markets where practices followed by firms reduce aggregate welfare. Finding robust indicators to measure competition is an enormous challenge. Competition authorities often rely on traditional measures of competition based on market profitability and concentration such as, for instance, the price-cost margin (PCM) and the Herfindahl-Hirschman index (HHI). Nevertheless, traditional indicators are not monotonic in competition, *i.e.*, an increase (reduction) in the PCM does not always translate a reduction (increase) in the intensity of competition in the market, thus potentially leading to inaccurate market competition assessments. For example, an increase in firms' aggressiveness is likely to lead to a redistribution of market shares amongst incumbents, benefiting more efficient firms (reallocation effect) and potentially forcing inefficient ones to exit the market (selection effect). In this scenario, there may be an increase in market's PCM, wrongly suggesting a reduction in competition. Similarly, competition analysis based on the HHI may also lead to inaccurate conclusions due to the presence of reallocation and selection effects. In fact, if efficient firms put more pressure on competitors and the least efficient ones exit, there may be an increase in market concentration, suggesting a fall in competition when the opposite actually occurred.

The non-monotonicity of traditional competition indicators is a highly undesirable feature from a policy perspective. In addition, Griffith *et al.* (2005) argue that traditional measures are poor indicators of competition in markets where firms have different marginal costs and goods are symmetrically differentiated. Besides, Boone *et al.* (2007) argues that competition analysis based on PCMs tends to fail in more important markets, *i.e.*, when there is a reduced number of firms, which are more likely to present anti-competitive practices.

Given these problems, the elasticity of profits to marginal costs was proposed by Boone (2008), who noticed that increases in competition, associated, for instance, to a fall in entry costs or to an increase in pressure posed upon competitors, always implies a transfer of profits from relatively less efficient firms towards relatively more efficient ones. Based on this fact, the author presented an alternative competition indicator with several theoretical and empirical advantages relatively to the traditional competition setup. Firstly, the indicator is monotonic in competition under the assumptions of product homogeneity, firms' symmetry (except on marginal costs), constant marginal costs and simultaneous and independent choice of the strategic variable. Nevertheless, under predatory prices, collusion and first mover's advantage, this result does not necessarily hold. Secondly, the indicator does not require that the universe of firms is observed, *i.e.*, the estimated profit transfer among a subset of firms conveys information for the market. Thirdly, empirical studies find that it tends to be less sensitive to the business cycle than the PCM. In fact, Boone (2008) regressed PCMs on sector and year dummies and found the latter significant and positively correlated with the business cycle. In addition, Griffith *et al.* (2005) compared the performance of different competition measures and refer that profit elasticity estimates are significantly less affected by cyclical downturns than the PCM.

The main empirical limitations of the Boone (2000, 2008) indicator are its need for a measure of firm efficiency (marginal costs) that is unobservable in the data, its dependence on a definition for the relevant market, its sensitiveness to the sample of firms and estimation methodologies used and the non-existence of an upper bound. Only these last two caveats are not extensive to the classical competi-



tion indicators. The empirical literature on Boone based measures is growing and recent contributions include Maliranta *et al.* (2007), Braila *et al.* (2010) and Devine *et al.* (2011).

The article is organized as follows. section 2 discusses the details of the empirical methodology, including a description of the profit elasticity indicator and the different estimation approaches, as well as a description of the database. Section 3 presents the results obtained for Portuguese markets. Section 4 offers some concluding remarks.

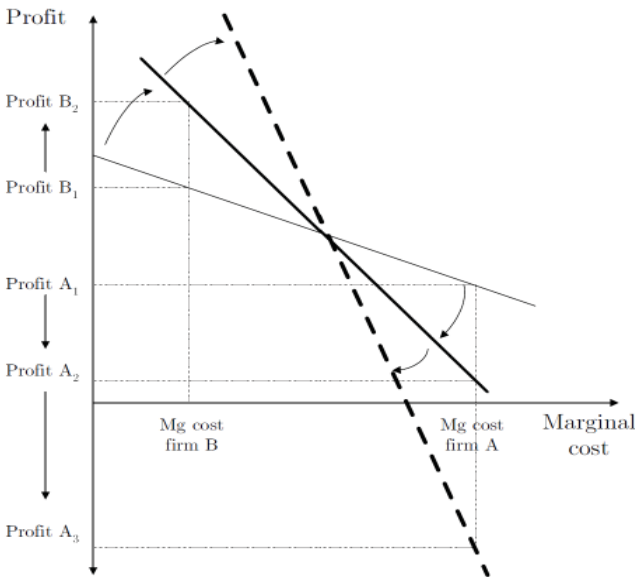
## 2. Methodology and Data

### 2.1. The profit elasticity indicator

The conceptual idea behind the profit elasticity indicator suggested by Boone (2000, 2008) is that competition leads to a transfer of profits towards relatively more efficient firms (those with lower marginal costs) at the expense of less efficient ones. In this context, the higher the intensity of market competition, the harsher is the punishment of relatively less efficient firms and the bigger the reward of relatively more efficient ones. It should be noted that relatively efficient firms may see their profits decrease as a result of an increase in competition, but in this case the reduction in profits is more severe for less efficient firms. In other words, a larger cost differential maps into a larger profit differential. In graphical terms, the empirical relation between profits and marginal costs is negative and its slope translates the concept of profit elasticity. It reflects the intensity of competition in the market, offering the basis for an empirical competition measure. Chart 1 illustrates this relation in a scenario of increased market competition. Relatively more efficient firms (type B) are rewarded with relatively higher profits and relatively inefficient firms (type A) face relatively lower profits. If the redistribution of profits across firms due to an increase in competition is strong enough, *i.e.*, if type A profits turn negative, these firms are forced to exit the market (selection effect). Note that the chart illustrates a linear relation, though this may not be necessarily the case for all the markets.

Chart 1

MARKET PROFIT ELASTICITY IN THE PRESENCE OF AN INCREASE IN COMPETITION



Similarly to traditional competition indicators, it is necessary to establish a definition of the relevant market. An accurate definition of the relevant market takes into account the degree of product substitution, transportation costs and the geographic location of producers and consumers. However, in this type of studies the aim is to set an overall competition assessment, thus it is assumed that markets can be correctly identified through an economic activity classification such as NACE. Nevertheless, this assumption may imply a substantial bias. For example, in the case of multi-product firms that sell goods that are not close substitutes. An analysis based on a high sectoral disaggregation may mitigate some problems. In addition, as previously mentioned, the measurement of firm efficiency is particularly difficult as it is directly related to marginal costs, which are unobservable in the data. In fact, the use of average variable costs as a proxy for marginal costs is problematic in the presence of non-constant returns to scale and other factors such as, brand loyalty, firm reputation and product quality. Nevertheless, if these features are constant over time, changes in the profit elasticity can still be correctly interpreted as changes in market competition.

## 2.2. Estimation

The empirical implementation of Boone (2008) involves estimating the slope of the relation between profits and a measure of efficiency for firms operating in each market and year. Two methodologies can be adopted. The first methodology is non-parametric and consists in computing the frontier between profits and efficiency using Data Envelopment Analysis (DEA).<sup>1</sup> The second methodology is parametric and relies on regressions to estimate the relation between profits and efficiency. The non-parametric approach may be a better choice in markets with a reduced number of players, where regression-based methods may turn out to be relatively weak due to the reduced number of degrees of freedom. Nevertheless, non-parametric methods may face convergence problems for several markets and years, hindering their practical usefulness. For this reason the article adopts the regression-based methodology.

Panel data models, such as two-way fixed effect models, are widely used to measure competition intensity in different markets. For example, Braila *et al.* (2010), Polder *et al.* (2009) and Boone *et al.* (2007) introduce firm and time fixed effects to assess competition developments for Belgian and Dutch firms, respectively. In this context, the log-log specification is often preferred in the empirical literature as it takes into account the skewness in the distribution of profits and average variable costs.

This specification has two advantages compared to a cross sectional approach. First, it captures unobserved heterogeneity by using firm fixed effects. In the presence of unobserved firm-level heterogeneity that is correlated with a measure of efficiency, the exclusion of firm fixed effects generates inconsistent estimates. Second, year fixed effects absorb the impact of sectoral shocks and control for the business cycle.

In theory, relatively more efficient firms are rewarded more significantly in markets that exhibit more intense competition. Therefore, profit elasticities are expected to be not only negative, but also lower in markets facing more intense competition (or higher in absolute value). Therefore, the proposed formulation is:

$$\ln(\Pi_{it}^j) = \alpha_i^j + d_t^j + \beta^j \ln(C_{it}^j), \text{ for each } j \text{ (market)} \quad (1)$$

where  $\Pi_{it}^j$  stand for profits and  $C_{it}^j$  a proxy of marginal costs of firm  $i$  operating in market  $j$  in period  $t$ . Firm and year fixed effects are  $\alpha_i^j$  and  $d_t^j$ , respectively.

<sup>1</sup> References to the DEA approach in the context of competition analysis are Simar and Wilson (2005) and Schiersch and Schmidt-Ehmcke (2010).

It should be noted that the panel specification does not include a control for firm size. This variable tends to be included as a way to capture some unobserved heterogeneity. The use of fixed effects for the firm allows for the absorption of this heterogeneity. Thus, firm size (measured by firm sales) is not included as a regressor, which minimizes possible endogeneity problems.<sup>2</sup>

Note also that the coefficient referring to the profit elasticity in equation 1 refers to the intensity of competition, whereas the main issue of interest are changes in competition through time. The estimation of an explicit trend coefficient for competition requires a formulation such as:

$$\ln(\Pi_{it}^j) = \alpha_i^j + d_t^j + (\beta^j + \gamma^j t) \ln(C_{it}^j), \text{ for each } j \text{ (market)} \quad (2)$$

where a positive (negative) trend coefficient  $\gamma^j$  implies a competition reduction (increase) in the market.

The methodology suggested by Boone (2000, 2008) entails the exclusion of firms with non-positive profits, creating a potential sample bias, which may lead to inconsistent results. Hence, ensuring robust results requires addressing this bias. The selection bias may be particularly important in Portugal since the proportion of firms with negative profits is not negligible. In approximately 90 per cent of markets, at least 20 per cent of firms exhibit negative operational profits. In order to test and correct for the potential sample selection bias, the two-step Heckman (1979) procedure was used, jointly estimating the participation and outcome equations. The exclusion restrictions used were firm's age and total assets (tangible and intangible, in logarithm). The logarithm of sales was introduced both in the participation and outcome equations to capture unobserved heterogeneity. It should also be noted that the implementation of the Heckman (1979) procedure requires the reintroduction in the database of firms with negative operational profits, representing around 30 per cent of the observations.<sup>3</sup> Moreover, it was only possible to estimate the procedure for firms with positive total assets and information regarding age.

### 2.3. Database

The data used in this article draws on information about the annual accounts of Portuguese corporations reported under *Central de Balanços (CB)* for 2000-2004 and *Informação Empresarial Simplificada (IES)* for 2005-2009.<sup>4</sup> Both databases, whose main difference is firm-level coverage, offer extensive information on items of firms' balance sheets and income statements. The IES database includes virtually the universe of firms, while CB comprises mainly larger firms, representing more than 65 per cent of gross value added (GVA) in the years considered. The raw dataset coincides with the one used in Amador and Soares (2012a), which computes a set of classical competition indicators for the Portuguese economy.

Competition analysis is always conditional on a market definition. The article defines markets at a 3-digit level in NACE classification, which seems a reasonable compromise between the consideration of products that are close substitutes and the existence of an acceptable number of firms in each market. This option is broadly in line with similar empirical studies conducted for other countries. Nevertheless, not all sectors were considered. Apart from "Financial activities" and "Public administration, defence and compulsory social security", which are not covered in the database, "Agriculture, hunting and forestry" along with "Mining and quarrying" were excluded due to their specific nature and small contribution to total GVA. In addition, "Education", "Health and social work" and "Other community, social and personal service activities" were not included given the high weight of the public sector in these markets.

<sup>2</sup> The endogeneity problem is related to the fact that sales and variable costs are in both sides of the regression.

<sup>3</sup> The observations referring to lowest 1 per cent in the pooled distribution of the price-cost margin were eliminated, consisting of unreasonably negative values.

<sup>4</sup> Although IES formally began in 2006, it included a report for 2005. For this reason, for the purpose of this article IES is considered from 2005 onwards.

Some observations were eliminated from the database. Firstly, observations associated to null sales or null variable costs were removed. Secondly, in order to obtain meaningful regressions, only markets with at least 5 firms per year in the entire time span are included (minimum of 50 observations). Thirdly, as previously mentioned, observations with non-positive profits must be excluded.<sup>5</sup> Fourthly, the existence of two versions of NACE in the sample period implied a harmonization procedure that led to the reclassification of some firms.<sup>6</sup> The final dataset includes 937,206 observations from 2000 to 2009. It comprises 285,236 different firms and each firm has an average of 3.3 observations. There are a total of 132 markets, 90 of which are considered as tradable and 42 as non-tradable. The latter sector represents 62 per cent of GVA, 66 per cent of sales and 54 per cent of total employment in the period 2005-2009. As argued in Amador and Soares (2012a), the set of tradable markets corresponds to all manufacturing markets plus those with a ratio of exports to sales above 15 per cent.<sup>7</sup>

Concerning the definition of variables, profits are computed as sales of products and services deducted from variable costs, which comprise costs with employees, costs of goods sold and external supplies. Under the current methodological approach, capital is assumed to be a fixed input, thus its cost is not included in variable costs. Therefore, rents should be excluded from variable costs, though this was not the case in this article. As a matter of fact, the response rate for this variable is reduced, hence its exclusion from total costs of services might introduce another type of bias in the results.

### 3. Results

This section presents a competition assessment for the Portuguese markets, based on profit elasticity levels and trends.<sup>8</sup> The baseline specification for the estimation of profit elasticities levels is the two-way fixed effects model (equation 1) for the period 2005-2009. The baseline estimation of trend profit elasticities is the two-way fixed effects model with an explicit trend coefficient for the period 2000-2009 (equation 2).<sup>9</sup> The two following subsections present profit elasticity levels and trends, respectively, starting from individual markets and highlighting the distinction between those that have a tradable and non-tradable nature. In addition, some sectoral aggregations are presented.

#### 3.1. Profit elasticity levels

Comparisons of profit elasticity levels across markets must be cautious as their levels reflect not only competition intensity, but also features such as returns to scale, product quality, brand loyalty and firm reputation. Thus, conclusions are more robust if based on the ranking of market profit elasticities rather than on actual levels. In addition, the comparison of markets or aggregates across countries with similar institutional setups is also relatively robust.

Estimated profit elasticity levels are negative, as predicted by the theory, and significant for virtually all markets considered (Chart 2). Time dummies were generally found non-significant, indicating that profit elasticities present low sensitivity to the business cycle.

<sup>5</sup> Firms with negative operational profits have been excluded, though some firms may still operate at a loss.

<sup>6</sup> Data from 2006 onwards correspond to NACE Rev. 2 and was adjusted to NACE Rev. 1.1 to be compatible with the remaining information.

<sup>7</sup> The list of tradable and non-tradable markets is available in the Appendix of Amador and Soares (2012b). Note that the set of markets considered in the article does not fully coincide with that in Amador and Soares (2012b), as those with less than 5 firms in each year were excluded from this analysis.

<sup>8</sup> More detailed results, including robustness tests, can be found in Amador and Soares (2012b).

<sup>9</sup> Profit elasticity levels and trends could be estimated jointly in equation 2. Nevertheless, the break in the database implies the inclusion in equation 2 of an interaction step-dummy for the period after 2005, implying different elasticity levels for the two sub-periods. Nevertheless, estimated elasticity levels for the period 2005-2009 under equations 1 and 2 are not very different.

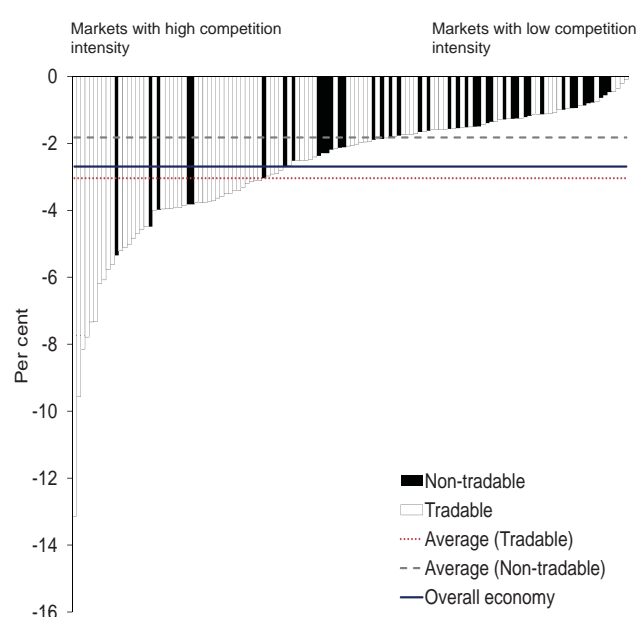
The ranking of elasticities across markets, from highest to lowest competition intensity, provides some insights (Chart 2). Firstly, there is a significant dispersion among profit elasticities in the markets. Estimated elasticities range between 0 and 13 percent, in absolute value, *i.e.*, the intensity of competition varies considerably across markets. It is noteworthy that among the markets with highest competition intensity (below the first quartile of the distribution of profit elasticity levels), 88 per cent refer to manufacturing markets and the remaining to “Trade”. Secondly, average absolute profit elasticity in tradable and non-tradable sectors is 3.1 and 1.9 per cent, respectively, suggesting a lower intensity of competition in the latter sector. In addition, several non-tradable markets are amongst those with lowest competition. Around 48 per cent of the markets with lowest competition intensity (above the fourth quartile) correspond to non-tradable markets and only one-third correspond to manufacturing markets.

The average profit elasticity for the Portuguese economy in 2005-2009 was 2.7 per cent, in absolute value, which is similar to figures found for Luxembourg (2.8 per cent) by Peroni and Ferreira (2011). The profit elasticities obtained for the Portuguese manufacturing and non-manufacturing sectors are, in absolute value, 3.3 and 1.8 per cent, respectively. Braila *et al.* (2010) report absolute profit elasticities in these sectors in the period 1997-2004 of 2.0 and 1.1 per cent for Belgium and 2.3 and 1.3 per cent for the EU-6, respectively.<sup>10</sup>

Table 1 details the information on profit elasticity levels, aggregating along different economic sectors and weighting according to their share in terms of markets, sales, GVA and employment. The intensity of competition for the aggregates presented tends to be lower in terms of sales and GVA. This result implies that larger markets within each sector tend to show lower competition. This is especially noticeable in “Electricity and water supply” and “Construction”. Still, the intensity of competition does not substantially differ across different aggregation variables. The tradable sector remains with higher intensity of competition than the non-tradable, and this result holds for the case of manufacturing versus non-manufacturing sectors. In the non-manufacturing sector, “Electricity and water supply” and “Other services” stand out as the ones potentially exhibiting lowest competition intensity, with absolute

**Chart 2**

**PROFIT ELASTICITIES ACROSS MARKETS IN THE PERIOD 2005 TO 2009**



**Source:** Authors' calculations.

**Notes:** Markets are ranked according to profit elasticity levels obtained using the two-way fixed effect model. Black bars correspond to non-tradable markets as defined in Amador and Soares (2012a).

<sup>10</sup> Contrary to this article, the non-manufacturing sector in Braila *et al.* (2010) includes the financial sector.

Table 1

PROFIT ELASTICITIES BY SECTOR IN THE PERIOD FROM 2005 TO 2009									
	N. of markets	Average (per cent)				Variation coef.	Standard Deviation	Min.	Max.
		Unweighted	Sales	Weighted GVA	Employment				
Overall economy	132	-2.7	-2.0	-1.9	-2.2	-0.7	2.0	-13.1	-0.1
Tradable	90	-3.1	-2.6	-2.6	-2.9	-0.7	2.2	-13.1	-0.1
Non-tradable	42	-1.9	-1.6	-1.5	-1.7	-0.6	1.1	-5.3	-0.5
Manufacturing	80	-3.3	-3.2	-3.2	-3.2	-0.7	2.2	-13.1	-0.1
Non-manufacturing	52	-1.8	-1.6	-1.5	-1.7	-0.6	1.0	-5.3	-0.5
Electricity and water supply	3	-1.2	-0.8	-0.7	-0.9	-0.7	0.9	-2.1	-0.5
Construction	4	-2.0	-1.2	-1.2	-1.3	-0.4	0.7	-2.5	-0.9
Trade	23	-2.2	-1.8	-1.9	-2.1	-0.6	1.3	-5.3	-0.8
Transports and communications	8	-1.8	-2.1	-2.1	-2.3	-0.3	0.5	-2.5	-1.1
Other services	14	-1.2	-1.0	-1.0	-1.4	-0.3	0.4	-1.8	-0.6

Source: Authors' calculations.

elasticities of 1.2 per cent in the period 2005-2009.

As previously referred, the computation of robustness tests is extremely relevant in this type of analysis. Chart 3 overlaps the estimated profit elasticity levels under several econometric approaches, sorting according to the two-way fixed effects competition levels. The alternative approaches considered are cross section regressions, random effects for firms and two-step Heckman (1979). The cross section approach consists in estimating regressions of profits on average variable costs for each year and market, using the logarithm of sales as a control for firm size.<sup>11</sup> Profit elasticities are taken as the average of the coefficients associated to average variable costs between 2005 and 2009.<sup>12</sup> Results obtained under the cross section approach, also yield negative and significant elasticities in their large majority. This result holds for the remaining approaches. At a 5 per cent level, profit elasticities were significant in around 89, 86 and 99 per cent of markets for two-way fixed effects, random effects for firms and two-step Heckman (1979), respectively. Therefore, taking into account the sample selection bias improves the significance of profit elasticities.

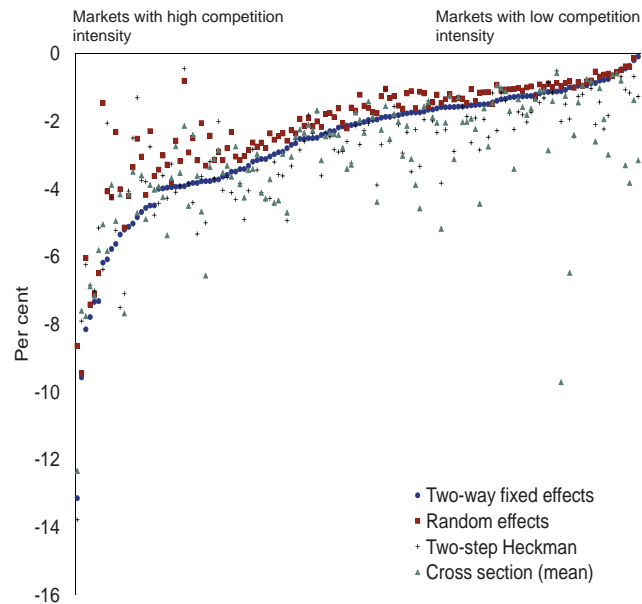
The ranking of estimated elasticities under fixed and random effects for firms is very similar, except in some of the markets with higher competition, though the classical Hausman (1979) test does not strongly support the latter specification. At a 5 per cent level, random effects are rejected in 80 per cent of the markets, while 87 per cent are rejected using the Hausman robust test (Wooldridge (2002)). Results obtained through cross section regressions are somewhat different. One of the reasons for this result is that, at odds with alternative econometric approaches, cross section regressions do not take into account the effect of the business cycle. The two-step Heckman (1979) procedure used to control for the potential sample selection bias does not reject the existence of bias in around 60 per cent of the markets. Nevertheless, the significance of the exclusion restrictions is somewhat limited as firm age was significant in only 64 per cent of markets and total assets (in logarithm) in 55 per cent of markets. Even so, corrected profit elasticity estimates are typically not far from those obtained under fixed effects

<sup>11</sup> Without the control for firm size, profit elasticities are not always negative and significant.

<sup>12</sup> In order to control for potential problems of heterocedasticity, the White (1980) procedure was used.

Chart 3

PROFIT ELASTICITIES ACROSS MARKETS ACCORDING TO SEVERAL ECONOMETRIC APPROACHES IN THE PERIOD FROM 2005 TO 2009



**Source:** Authors' calculations.

**Notes:** Markets are ranked according to profit elasticity levels obtained using the two-way fixed effect model.

and its ranking across markets is not substantially changed.

Finally, the results reported in this section are based on the 2005-2009 period, for which the database covers the universe of firms. Nevertheless, for the period 2000-2009, estimates using two-way fixed effects and alternative econometric approaches yield results which are extremely close to those reported.

### 3.2. Profit elasticity trends

Profit elasticity trends are more robust indicators of market competition developments than their levels, particularly if different estimation methodologies and specifications provide consistent results. If returns to scale, product quality, firm reputation, brand loyalty and institutional setups are relatively stable through time, trends are more likely to translate changes in competition.

Chart 4 presents profit elasticity trends estimated under two-way fixed effects for each individual market (equation 2).<sup>13</sup> Positive bars identify potential competition reductions, *i.e.*, the level of the profit elasticity increases (decreases in absolute value). Chart 4 reports that 58 per cent of markets record positive trends, 29 per cent of which are non-tradable. Nevertheless, the percentage of non-significant estimates is substantial (67 per cent of markets). In addition, as previously mentioned regarding profit elasticity levels, there is a significant dispersion between profit elasticity trends across markets.

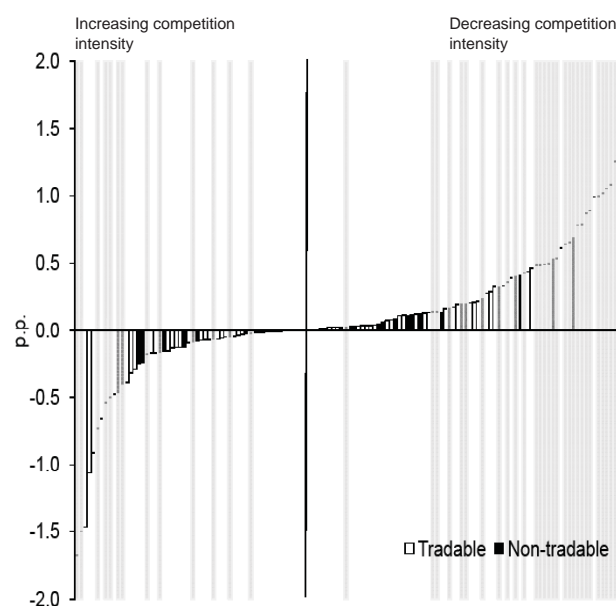
Table 2 presents competition trends estimated under the two-way fixed effects specification for the overall economy in the period 2000-2009, using as weights the share of markets, sales, GVA and employment.<sup>14</sup> The weights used for each market refer to 2005-2009 as the coverage of the database

<sup>13</sup> The estimates for the trend profit elasticity in each individual market are presented in Amador e Soares (2012b).

<sup>14</sup> In order to take account of the increase in the number of observations in 2005, due to the beginning of IES database, an interaction step-dummy was included in this year and found to be statistically significant.

Chart 4

## PROFIT ELASTICITY TRENDS ACROSS MARKETS IN THE PERIOD FROM 2000 TO 2009



**Source:** Authors' calculations.

**Notes:** Light gray bars identify significant trend coefficients at 10 per cent. Black bars correspond to non-tradable markets as defined in Amador and Soares (2012a).

in this period coincides with the universe firms, contrary to the previous years. Weights are based on the average period, hence there is no structure effect. This table presents the proportion of markets with positive and negative profit elasticity trends, reporting also such proportions if trends are significant at a 10 per cent level.

The majority of Portuguese markets presented a reduction in the intensity of competition in the period 2000-2009. Moreover, using sales, GVA and employment, competition reductions become more substantial, reaching three-quarters in the latter option. This result implies that the set of markets that faced competition reductions accounts for the large majority of sales, GVA and employment in the Portuguese economy. If only significant estimates are considered, competition reductions become less relevant in quantitative terms, though they are still considerably more important than increases in competition. Around 40 per cent of total employment in the economy is allocated to markets that reported a decreasing level of competition. Overall, this implies that decreases in competition are generalized across markets and relevant in terms of sales, GVA and employment.

Consistently with results for the overall economy, the majority of markets in the tradable and non-tradable sectors presented a decrease in the degree of competition (Table 2). In addition, the non-tradable sector exhibits a lower incidence of competition reductions compared to the tradable sector in terms of percentage of markets but not if these are weighted using sales, GVA and employment shares. In fact, competition reductions in the non-tradable sector are substantially relevant in terms of resources. More than 70 per cent of GVA and employment of the non-tradable sector refers to markets that faced competition reductions.

Results become milder if only significant trends are considered, even though the percentage of non-tradable markets with decreasing competition is still above 40 per cent of GVA and employment in the sector. Furthermore, results are qualitatively unchanged if the manufacturing versus non-manufacturing distinction is used and they are robust across the estimation approaches considered. At sectoral level,



Table 2

TREND PROFIT ELASTICITIES: AGGREGATIONS BY SECTOR   PER CENT		Markets	Sales	GVA	Employment
Reduction in competition (Increase in profit elasticity, $\gamma > 0$ )	Overall economy	58	64	67	74
	Non-tradable	52	69	74	84
	Tradable	60	54	54	61
	Overall economy	23	28	33	39
	Signif. 10% Non-tradable	21	32	41	43
	Tradable	23	19	20	33
Increase in competition (Decrease in profit elasticity, $\gamma < 0$ )	Overall economy	10	11	13	4
	Signif. 10% Non-tradable	14	10	13	3
	Tradable	8	13	14	7

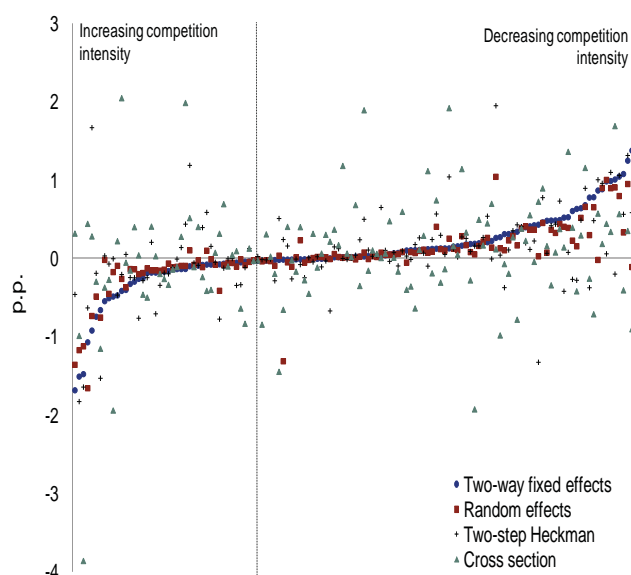
Source: Authors' calculations.

the most striking result lays in the "Construction" sector, where virtually all markets exhibit decreases in competition using as weights either sales, GVA or employment.

Results obtained using alternative econometric approaches, considered as robustness tests, are presented in chart 5. The conclusions based on these estimations are qualitatively similar to those obtained with the fixed effects formulation and the ranking of markets is broadly unchanged. Nevertheless, some differences are observed mainly in the cross-section specification.<sup>15</sup>

Chart 5

#### PROFIT ELASTICITY TRENDS ACROSS MARKETS ACCORDING TO SEVERAL ECONOMETRIC APPROACHES



Source: Authors' calculations.

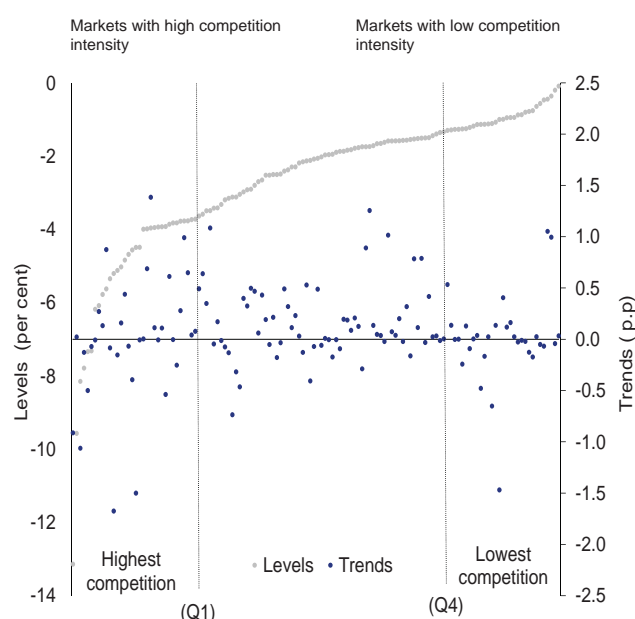
Notes: Markets are ranked according to profit elasticity trends obtained using the two-way fixed effect model.

<sup>15</sup> This specification consists of two steps. Firstly, regressions of profits on average variable costs with a control for size (the logarithm of sales) are estimated, using the White (1980) procedure to correct for heterocedasticity. Secondly, a time trend is fitted on profit elasticities obtained in the first step using Newey-West procedure to control for autocorrelation of first order.

Another dimension in the analysis consists in verifying the evolution of markets that stand in the tails of the distribution of profit elasticity levels, *i.e.*, those potentially least and most competitive. The idea is to check whether least competitive markets are also the ones where competition decreased, *i.e.*, reported a positive trend for the profit elasticity ( $\gamma^j$ ). Such a scenario entails a more negative assessment of competition. Chart 6 presents profit elasticity trends sorted according to the levels of the indicator obtained under the two-way fixed effects model for the period 2005-2009. The conclusion is that the majority of markets with lowest competition intensity (above the fourth quartile of the profit elasticity distribution) present positive profit elasticity trends, *i.e.*, reductions in competition (52 per cent in the two-way fixed effects model and 58 per cent using two-step Heckman (1979)). Hence, the majority of markets exhibiting lowest competition intensity did not become more competitive.

Chart 6

## PROFIT ELASTICITY LEVELS AND TRENDS (2000-2009)



**Source:** Authors' calculations.

**Notes:** Markets are ranked according to profit elasticity levels obtained using the two-way fixed effect model for the period 2005-2009.

#### 4. Concluding remarks

The assessment of competition developments in an economy is an important element for applied policy-analysis. This article takes firm-level data from 2000-2009 to assess competition in the Portuguese markets using the elasticity of profits to marginal costs, suggested by Boone (2008). The article reports profit elasticity levels and trends for the different markets, focusing mainly on the distinction between tradable and non-tradable sectors.

The article concludes that there is a significant dispersion across market profit elasticity levels. In the benchmark econometric specification, the average absolute profit elasticity in the Portuguese economy is 2.7 per cent in the period 2005-2009, a magnitude similar to the ones presented in studies for other EU countries. Moreover, average absolute profit elasticity in tradable and non-tradable sectors is 3.1 and 1.9 per cent, respectively, suggesting a lower intensity of competition in the latter sector. When individual markets are aggregated using as weights their shares in total sales, GVA and employment, the non-tradable sector remains less competitive.

Since profit elasticity levels are not directly comparable across markets, trends are generally considered a more robust indicator of competition developments. In this context, one important conclusion of the article is that the majority of markets decreased competition intensity in the period 2000-2009, though there is substantial heterogeneity. In addition, markets that faced reductions in competition represent the large majority of sales, GVA and employment in the Portuguese economy. Moreover, the non-tradable sector presents a lower incidence of competition reductions compared with the tradable sector in terms of percentage of markets, but not in terms of their share in sales, GVA and employment. Finally, the majority of markets with lowest levels of competition did not become more competitive.

All in all, there is substantial room to improve competition in the Portuguese economy, specially in the non-tradable sector. Such an increase in competition could lead to a more efficient allocation of resources in the Portuguese economy, contributing to the correction of existing macroeconomic imbalances. In fact, entry and exit of firms across markets and the reallocation of resources towards the most efficient firms within a given market are key elements to increase total productivity. Future research should explore the economic determinants of these effects.

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## AN EVALUATION OF GOVERNMENT EXPENDITURES' EXTERNALITIES\*

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### ABSTRACT

We estimate, using US data, a general equilibrium model with two salient features. First, we allow government consumption to directly affect the welfare of agents. Second, we allow public capital to shift the productivity of private factors. On the one hand, private and government consumption are estimated to be substitute goods, that is, all else equal an increase in government consumption leads agents to partially substitute private consumption with the newly available government consumption. Because of this, labor supply reacts little to a government consumption shock and, hence, the estimated output multiplier is much lower than in models with separabilities, peaking - on impact - at 0.33. On the other hand, non-defense public investment enhances mildly or negligibly, depending on the specification, the productivity of private factors. In the specifications where non-defense public investment is found to be productive, a non-defense investment shock generates the following estimated responses (after several quarters): a positive reaction for private consumption, the value of firms, private investment and real wages. Unlike in models with unproductive government investment, the estimated output multiplier builds up over time, reaching roughly 1.5 after six years.

### 1. Introduction

Assessing the mechanisms through which government spending affects the private sector has occupied a large portion of the macroeconomic literature. The current debate on the design of fiscal stimuli and consolidations across industrialized countries has renewed the interest on such mechanisms. This article contributes to the debate by conducting a positive analysis on the effects of “externalities” produced by government spending. By externality we mean that government consumption may influence the welfare of agents or, more precisely, it can affect households’ marginal utility of consumption and, therefore, the level of consumption itself. This occurs if some items of government consumption act as substitutes or complements for private consumption. For example, public health care can reduce the need for private health services, or, public education services can reduce the need for private tutors and schools but, on the other hand, increase the demand for textbooks or personal computers. These potential relations between private consumption and different items of public spending make government consumption, on the aggregate, to be either substitute or complement for private consumption. Thus, omitting a priori the channel of substitutability/complementarity can produce biased estimates of the response of private consumption to a government consumption shock. Importantly, even the reaction of labor supply, and

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hence of output, to such a shock depends on the relation in preferences between private and public consumption. Also, government investment can create externalities for the private sector. More precisely, public capital can act as a shifter of the productivity of private factors, such that a shock to public investment has the potential to affect the dynamics of several variables such as private investment, consumption as well as output. For example, an efficient system of public highways built in place of an old route can enhance the productivity of private firms operating in that area (e.g. by fostering within-country trade). Again, omitting this role for government investment can bias estimates of its effects.

Although the potential effects of government consumption on private consumption through preferences have long been considered (e.g. Barro, 1981), the standard hypothesis of the bulk of the macroeconomic literature (e.g. Baxter and King, 1993 or Smets and Wouters, 2007) is that private and government consumption are separable in preferences, *i.e.*, the marginal utility of consumption is independent of the level of public consumption. Moreover, public capital is often omitted since it is assumed to be “unproductive” (exceptions are Baxter and King, 1993 or Pappa, 2009, or Leeper *et al.*, 2010). Within these models, the so called *negative wealth effect* is the main driver of spending shocks. If government spending increases, then the present discounted value of taxes to be paid by households also increases and so permanent income is lower. The well known consequence of this effect is the negative correlation between public spending and private consumption conditional on government spending shocks.<sup>1</sup> The negative wealth effect impacts positively on labor supply which, in turn, generates an increase in output and a decrease in real wages.<sup>2</sup> Finally, private investment usually falls in response to a (temporary) government spending shock.

Against this background, it is clear that the externalities we explore have the potential to flip the usual sign of the reactions to government spending shocks or, even if the sign is correct, to assess the likely bias of these responses. Importantly, if one is interested on output effects of fiscal stimulus, it's obvious that the responses obtained in Uhlig (2010) - focusing on distortionary taxes - or in Christiano *et al.* (2011) - focusing on the zero lower bound - or in Monacelli, Perotti and Trigari (2010) - focusing on the labor market - can be affected by the government spending externalities.

Our objective is thus answering three main questions: is it reasonable to assume independence in preferences between private and government consumption (*i.e.*, separability)? Is there evidence that public capital shifts the productivity of private factors? What are the effects produced by these externalities? To answer these questions we add the two “externalities channels” into an otherwise standard general equilibrium model with flexible prices, *i.e.*, a Real Business Cycle (RBC) model.

On the one hand, estimation of various versions of the model indicates that government and private consumption are substitute goods. This means that an increase in government consumption makes private consumption less enjoyable and, all else equal, leads agents to partially substitute private consumption with the newly available government consumption. As a consequence, agents want to work less relative to a world with separable government consumption. Hence, the estimated output multiplier is much lower (approximately one third) compared to the one obtained in models with separabilities, peaking - on impact - at 0.33. On the other hand, non-defense public investment enhances mildly or negligibly, depending on the specification, the productivity of private factors while investment in defense appears not to have any such impact. In our benchmark specification, a non-defense investment shock generates

<sup>1</sup> Notable exceptions can be found in the literature. For example, Galí, López-Salido and Vallés (2007) introduce a market imperfection in a new Keynesian model, namely, a share of the population cannot borrow or lend. Because of this, aggregate consumption can increase after a government spending shock. Following a different route, Linnemann (2006) builds a neoclassical model in which leisure and consumption are not separable in preferences. This type of non-separability can allow consumption to react positively to government spending shocks.

<sup>2</sup> Real wages surely react negatively within a flexible prices model since the labor demand schedule remains unchanged. Instead, in versions of sticky prices models, real wages can happen to increase in response to a government spending shock (see Linnemann and Schabert, 2003).

the following estimated responses after several quarters: a positive reaction for private consumption, the value of firms, private investment and real wages. The estimated output multiplier builds up over time, reaching roughly 1.5 after six years. Note that the output multiplier measured from the model with unproductive government investment, behaves in the opposite way. It starts higher on impact, *i.e.* around one, and then falls gradually over time.

The remainder of the article is organized as follows: section 2 gives an overview of the empirical evidence and relates it to our work. Section 3 outlines the model while section 4 describes the estimation exercise and results. In section 5, concluding remarks are presented.

## 2. Review of The Empirical Evidence

Virtually all the estimates of the degree of substitutability/complementarity between private and government consumption are obtained within partial equilibrium models or based on a few equilibrium conditions (mainly Euler equations). The empirical evidence obtained by estimating Euler equations is not conclusive. Aschauer (1985) finds a significant degree of substitutability between the two variables in the case of the U.S. whereas Amano and Wirjanto (1998) find weak complementarity. Focusing on the UK, Ahmed (1986) finds substitutability while Karras (1994), examining the relationship between private and public consumption across thirty countries, finds that the two types of goods are best described as complementary (but often unrelated). Fiorito and Kollitznas (2004) split government consumption in two groups named “public goods” and “merit goods”. The first includes spending in defense, security forces and judicial system; the second contains health, education and other services that can be provided privately. They use dynamic panel methods motivated by Euler equations and show that, for twelve European countries, public goods slightly substitute while merit goods complement private consumption. Using general equilibrium models provides at least two contributions. First, estimates of the elasticity of substitution within partial equilibrium models are prone to suffering from omitted variables bias (e.g. the negative wealth effect can bias the estimates of such elasticity). Second, a general equilibrium framework allows us to study the effects of government spending on several variables simultaneously. Along this line of research, Bouakez and Rebei (2007) estimate private and government consumption to be complement goods within a general equilibrium framework, using Maximum Likelihood estimation and U.S. data. Our analysis differs from theirs in various aspects, other than in the results.<sup>3</sup>

The other class of papers related to our work focuses on the importance of public capital in boosting output growth. Aschauer (1989) estimates an aggregate production for the U.S. economy, with inputs being labor, private capital but also public capital, finding that the output elasticity of government capital is 0.39. Following a similar approach, Finn (1993) estimates much lower output elasticities of various items of government capital (the largest is 0.16 for highways) and surrounded by great uncertainty. The implication of these two papers is that public capital is an important explanatory factor for changes in the productivity of the economy. Other authors, like Tatom (1991), find, instead, that the best estimate for the mentioned elasticity is zero. Belo and Yu (2011) report movements in stock returns compatible with a specification, very similar to ours, where public investment is directly productive. Unlike all these papers, we estimate the productivity shift caused by public capital within a general equilibrium model. As a consequence, we can study the effect of a government investment shock, while controlling for general equilibrium effects. There are virtually no estimates of the effects of a government investment

<sup>3</sup> Crucially, unlike us, they do not use public spending data throughout the estimation; we believe that using this data is essential to correctly identify and measure the elasticity of substitution between private and public consumption, especially within closed economy models. Further, unlike us, they use HP filter detrended data, which implies a loose mapping between the model's variables and the data. Finally, they fix some relevant parameters, e.g. the parameter measuring the weight of private consumption in the effective consumption aggregator. On the contrary, we estimate it since this parameter is fundamental to establish whether or not government consumption affects the welfare of agents.

shock within an estimated general equilibrium model. However, it is worth noting the work of Leeper *et al.* (2010) who analyze, within an estimated general equilibrium model, scenarios with different values for the output elasticity of public capital. Conditional on choosing the value of 0.1 for this elasticity, they find an output multiplier ranging from 0.90 to 1.14 within the first three years. Baxter and King (1993), within a fully calibrated framework, find a long-run output multiplier equal to 4.12, conditional on choosing 0.1 for the output elasticity of public capital. Straub and Tchakarov (2007) conduct a calibration exercise for the Euro area within a general equilibrium framework, finding that under reasonable parameter values both permanent and temporary public investment shocks generate a much larger multiplier than the one obtained upon exogenous increases in government consumption. Finally, turning to the analysis of vector autoregressions (VARs), Perotti (2004) uses a structural VAR identified with institutional information and finds that a government investment shock creates an output multiplier which peaks on impact at 1.68, for the U.S.. Interestingly, Pappa (2009), using a sign-restrictions identified VAR and U.S. state data, finds that government investment increases both employment and real wages.

### 3. The Model

We now briefly describe our model economy, making clear the problems solved by households and firms. We also describe the behavior of the government, or fiscal authority. In a nutshell, we will be looking at an otherwise standard RBC model augmented with two ingredients aimed at assessing the role of government consumption and investment on private decisions. More precisely, government consumption is allowed to affect the marginal utility of consumption and public investment is allowed to enhance the productivity of private factors by entering the final goods' production function. Further, we borrow from the literature ingredients that have proven useful to fit the data: external habit formation in consumption, monopolistic competition in factor markets, investment adjustment costs, costs of adjusting capacity utilization and distortionary taxation. Uncertainty arises from six orthogonal shocks: a preference shock, total factor productivity, investment adjustment, wage markup (wedge) as well as public consumption and public investment shocks. Most often we break public investment into defense and non-defense items which results in the addition of another shock.

#### 3.1. Households

The economy is populated by a continuum of households. We assume that the representative household derives utility from effective consumption,  $\tilde{C}_t$ , and disutility from working,  $L_t$ , in each quarter  $t$ . Effective consumption is assumed to be an aggregator of private consumption,  $C_t$ , and government consumption,  $G_t$ :

$$\tilde{C}_t = \left[ \varphi (C_t)^{\frac{\nu-1}{\nu}} + (1-\varphi) G_t^{\frac{\nu-1}{\nu}} \right]^{\frac{\nu}{\nu-1}}, \quad (1)$$

where  $\varphi$  is the weight of private consumption in the effective consumption aggregator, and  $\nu \in (0; \infty)$  is the elasticity of substitution between  $C_t$  and  $G_t$ .<sup>4</sup> Note that if  $\varphi = 1$  then  $\tilde{C}_t = C_t$  and the standard hypothesis of separability emerges. The lifetime expected utility is given by:

$$E_0 \left\{ \sum_{t=0}^{\infty} \beta^t e^{\varepsilon_t^b} \left[ \ln(\tilde{C}_t - h\tilde{C}_{t-1}^A) - \chi \frac{1}{1+\sigma_L} (L_t)^{1+\sigma_L} \right] \right\} \quad (2)$$

<sup>4</sup> When  $\nu = 0$ , we have a Leontief" aggregator, i.e.  $C_t$  and  $G_t$  become perfect complements. When  $\nu = 1$ , we have a Cobb-Douglas" aggregator of the form  $\tilde{C}_t = C_t^\varphi G_t^{(1-\varphi)}$ . As  $\nu \rightarrow \infty$ , we have a linear aggregator of the form  $\tilde{C}_t = \varphi C_t + (1-\varphi) G_t$ , the two goods are perfect substitutes.



$\tilde{C}_{t-1}^A$  is the aggregate level of effective consumption at time  $t-1$  which creates external habit formation in consumption. The parameter  $h \in (0,1)$  measures the degree of habit formation in effective consumption whereas  $\beta \in (0,1)$  is the subjective discount factor,  $\sigma_L$  is the inverse of the Frisch elasticity of labor supply and  $\chi$  is a positive number fixing the steady-state level of labour.  $\varepsilon_t^b$  represents a preference shock, assumed to follow a first-order autoregressive process with an i.i.d.-normal error term. To analyze the substitutability/complementarity mechanism channel, we look at the derivative of the instant marginal utility of consumption with respect to government consumption. Given a steady-state level of consumption, this is given, in log-linearized form, by:

$$U_{cg} = (1 - \varphi) \left( G / \tilde{C} \right)^{\frac{v-1}{v}} \left( \frac{1}{v} - \frac{1}{(1-h)} \right), \quad (3)$$

where  $G$  and  $\tilde{C}$  are the steady-state levels of government consumption and effective consumption, respectively. The parameters which are important in delivering the sign to  $U_{cg}$  are the elasticity of substitution between private and government consumption,  $v$  and the level of habit persistence,  $h$ . When  $U_{cg}$  is greater than 0, private and government consumption are defined to be complements; when  $U_{cg}$  is less than 0, private and government consumption are defined to be substitutes; when  $U_{cg}$  is equal to 0, private and government consumption are not related in preferences. Obviously, if we set  $\varphi$  equal to 1 government consumption does not enter the utility function and  $U_{cg}$  collapses to zero. For values of  $\varphi$  less than one,  $U_{cg}$  can be either positive or negative depending on the other parameters in  $U_{cg}$ . In particular,  $U_{cg}$  is strictly positive if  $v < 1 - h$  and negative otherwise. Since  $0 \leq h < 1$ ,  $v > 1$  guarantees that  $U_{cg}$  is negative.

Households maximize their lifetime expected utility by choosing consumption,  $C_t$ , labor supply,  $L_t$ , next period's physical capital stock,  $K_{t+1}$ , the level of investment,  $I_t$ , and the intensity with which the installed capital stock is utilized,  $u_t$ . We present the version of the model with distortionary taxation on labor, consumption and capital, with marginal rates given, respectively, by  $\tau^w, \tau^c$  and  $\tau^k$ . The agents thus face the following budget constraint (expressed in real terms):

$$(1 + \tau^c)C_t + I_t = (1 - \tau^w)W_t L_t + (1 - \tau^k) \left[ r_t^k u_t - a(u_t) \right] K_t + D_t - T_t, \quad (4)$$

where  $r_t^k$  is the net return on capital,  $W_t L_t$  is labor income,  $a(u_t)$  represents the cost of using capital at intensity  $u_t$  (see, e.g., Schmitt-Grohé and Uribe, 2006),  $D_t$  are the dividends paid by household-owned firms while  $T_t$  are lump-sum taxes/transfers to/from the government.<sup>5</sup>

The capital stock evolves according to the following equation:

$$K_{t+1} = (1 - \delta_k) K_t + I_t \left[ 1 - S \left( e^{\varepsilon_t^I} \frac{I_t}{I_{t-1}} \right) \right], \quad (5)$$

where  $\delta_k$  is the depreciation rate and the function  $S(\cdot)$  introduces investment adjustment costs à la Christiano, Eichenbaum, and Evans (2005). Specifically,  $S(\cdot) = \frac{\kappa}{2} \left( e^{\varepsilon_t^I} \frac{I_t}{I_{t-1}} - e^{\bar{\gamma}} \right)^2$ , where  $\varepsilon_t^I$  is a shock to the investment cost function assumed to follow a first-order autoregressive process with an i.i.d.-normal error term, and  $\bar{\gamma}$  is the steady-state growth rate of productivity (see the next section for details).

<sup>5</sup> In order to justify the existence of a representative agent we complete the markets by making agents able to trade a full set of state-contingent claims. In equilibrium these are in zero net supply.

### 3.2. Firms and Labour Market

Here we describe very briefly the labour and product markets. In order to simplify the exposition we postulate directly the price/wage setting process. The general and widely used setup rationalizing the resulting equilibrium conditions can be found in Ercolani and Valle e Azevedo (2012). We assume there is a continuum of monopolistically competitive firms each of which produces a single variety of final goods,  $Y_{j,t}$ . All firms are identical and all varieties have the same degree of substitutability (elasticity of substitution) vis-a-vis any other variety. In equilibrium, households split their consumption uniformly over varieties and we are able to abstract from index  $j$  for firms. We focus throughout on the representative firm. This firm produces the final good  $Y_t$ , using as inputs capital services,  $K_t$  and labor services,  $L_t$  from competitive suppliers. Moreover, we augment the standard production function with  $K_t^G$ , representing the “productivity” of public capital. The production function is given by:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} (K_t^G)^{\theta_g} - \Phi, \quad (6)$$

where  $A_t$  is a productivity shock.<sup>6</sup> The process for  $\ln(A_t)$  evolves according to:

$$\ln(A_t) = \bar{\gamma} + \ln(A_{t-1}) + \varepsilon_t^a, \quad (7)$$

where  $\bar{\gamma}$  is the steady-state growth rate of productivity (and hence of the economy) and the productivity shock evolves according to  $\varepsilon_t^a = \rho_a \varepsilon_{t-1}^a + \eta_t^a$ , where  $\eta_t^a$  is an i.i.d.-normal sequence. The parameter  $\Phi$  represents a fixed cost of production while  $\theta_g \in (0; \infty)$  is the output elasticity with respect to public capital productivity. Conditional on  $\theta_g > 0$ ,  $K_t^G$  has a direct effect on firm's output and, as a consequence of this, a positive influence on the productivity of private factors. The higher  $\theta_g$  is, the more effective is  $K_t^G$  in boosting firm's output and private productivities. Notice that if  $\theta_g = 0$ , the standard production function pops up and  $K_t^G$  doesn't produce any externality effects. The productivity of public capital is assumed to evolve according to:

$$K_{t+1}^G = (1 - \delta_{Kg}) K_t^G + \xi_t^{ig}, \quad (8)$$

where  $\delta_{Kg}$  is the depreciation rate and  $\xi_t^{ig}$  is the public investment rate (in our case, public investment,  $I_t^g$ , over total output, i.e.  $\xi_t^{ig} = I_t^g / Y_t$ ). We will later specify how  $\xi_t^{ig}$  evolves. For now, we refer that  $\xi_t^{ig}$  follows a stationary process (which seems consistent with the data), implying that  $K_t^G$  is stationary. This is convenient for technical reasons (see Belo and Yu, 2011 and references therein for a similar specification and reasoning) and avoids keeping track of - poorly measured - public capital.

The solution of the profit maximization problem for the firms amounts to setting the price  $P_t$  as a markup, equal to  $\lambda_{p,ss}$ , over marginal cost.

In this article we only consider versions of the model with public investment split into defense and non-defense items. The production function for final goods varieties producers becomes:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} (K_t^G)^{\theta_g} (K_t^{G,def})^{\theta_{g,def}} - \Phi,$$

where the productivity of defense capital,  $K_t^{G,def}$ , is assumed to evolve according to  $K_{t+1}^{G,def} = (1 - \delta_{Kg,def}) K_t^{G,def} + \xi_t^{ig,def}$  and  $\xi_t^{ig,def}$  is defense investment over output, i.e.  $\xi_t^{ig,def} = I_t^{g,def} / Y_t$ .

Public investment,  $I_t^g$ , is then assumed to exclude defense items.

Regarding the labor market, we assume there is a continuum of monopolistically competitive households

<sup>6</sup> The chosen specification implies substitutability between private capital and the productivity of public capital as typical in the literature, see e.g. Aschauer (1989), Finn (1993), Baxter and King (1993) or Leeper *et al.* (2010).

who are able to set their wage as a markup over the marginal rate of substitution between consumption and leisure. The markup is stochastic and follows a first order autoregressive process.

### 3.3. Government

First, we specify the evolution of public consumption,  $G_t$ , and public investment,  $I_t^g$  (we use exactly the same formulation for  $I_t^{g,def}$ ) These can always be expressed as a varying fraction of output:

$$G_t = \xi_t^g Y_t ; \quad I_t^g = \xi_t^{ig} Y_t.$$

We further specify  $\xi_t^g$  and  $\xi_t^{ig}$  as follows:

$$\xi_t^g = \exp(\varepsilon_t^g + ss^g) / (1 + \exp(\varepsilon_t^g + ss^g)) ; \quad \xi_t^{ig} = \exp(\varepsilon_t^{ig} + ss^{ig}) / (1 + \exp(\varepsilon_t^{ig} + ss^{ig})).$$

This formulation (basically a reparametrization) ensures  $\xi_t^g$  and  $\xi_t^{ig}$  are always between 0 and 1. The exogenous shocks  $\varepsilon_t^g$  and  $\varepsilon_t^{ig}$  to government consumption and investment, respectively, follow autoregressive processes:

$$\varepsilon_t^g = \rho_g \varepsilon_{t-1}^g + \eta_t^g \quad (9)$$

$$\varepsilon_t^{ig} = \rho_{ig} \varepsilon_{t-1}^{ig} + \eta_t^{ig}, \quad (10)$$

where  $\eta_t^g$  and  $\eta_t^{ig}$  are normal i.i.d. and mutually independent with mean zero. Note that  $ss^g$  and  $ss^{ig}$  fix the average (or steady-state) levels of  $\xi_t^g$  and  $\xi_t^{ig}$  (denoted, respectively, by  $\xi^{g,ss}$  and  $\xi^{ig,ss}$ ). Since Ricardian equivalence holds in the model, we abstract from government debt and assume that the government balances its budget.

### 3.4. Solution

We start by deriving the first order conditions associated with the households' and firms' problems, combining them with market clearing conditions and exogenous processes while recognizing that all firms and households are ex-ante identical. The equilibrium concept is standard. The labor market is in equilibrium when labour demanded by firms equals the differentiated labour services supplied by households at the aggregate wage rate  $W_t$ . The market for capital is in equilibrium when the demand for capital services by the firms equals the capital supplied by households at the market rental rate  $r_t^k$ . Finally, the final goods market is in equilibrium when the supply by firms equals the demand by households and government:

$$Y_t = C_t + I_t + a(u_t)K_t + G_t + I_t^g + I_t^{g,def}. \quad (11)$$

All the equilibrium conditions can be found in Ercolani and Valle e Azevedo (2012). Before proceeding to the estimation, we log-linearize the model equations around the deterministic steady-state. The exception to log-linearization occurs with the variables  $\xi_t^g$ ,  $\xi_t^{ig}$  and  $\xi_t^{ig,def}$ , which are fractions of total output.

## 4. Estimation

We estimate the model using standard Bayesian techniques, using U.S. data from 1969Q1-2008Q3, see the Appendix for a detailed description of the dataset. We take as observables log differences of quarterly real output (GDP), real consumption, real investment and real wages as well as a particular transformation of public consumption and public investment (the latter split into defense and non-defense items), consistent with the formulation of the processes for  $G_t = \xi_t^g Y_t$  and  $I_t^g = \xi_t^{ig} Y_t$  described earlier. We believe that using data until 2012 could open (further) issues of misspecification in our empirical model (e.g. driven by the absence of financial frictions and the lack of consideration of the zero lower bound on

nominal interest rates).<sup>7</sup> Importantly, the mapping of data to variables in the model is exact, that is, we do not filter data before proceeding to estimation (for details see Ercolani and Valle e Azevedo, 2012).

Bayesian estimation entails specifying prior distributions (beliefs of the analyst) for the parameters that are not fixed. Let  $P(\theta | m)$  be the prior distribution of the parameter vector  $\theta \in \Theta$  for some model  $m \in M$  and  $L(X_T | \theta, m)$  be the likelihood function for the observed data  $X_T = \{x_t\}_{t=1}^T$ , conditional on the parameter vector  $\theta$  and model  $m$ . The posterior distribution of the parameter vector  $\theta$  for model  $m$ ,  $P(\theta | X_T, m)$ , is then obtained combining the likelihood function for  $X_T$  (i.e., information from the sample) with the prior distribution of  $\theta$ :

$$P(\theta | X_T, m) \propto L(X_T | \theta, m)P(\theta | m), \quad (12)$$

$P(\theta | X_T, m)$  can be thought of as the probability of  $\theta$  taking a particular value given the prior information and information from the data. This function can be numerically maximized to obtain the mode (the most likely value of  $\theta$  given prior information combined with sample information), which is often seen as a point estimate of the parameter vector  $\theta$ . Simulation algorithms allow us to obtain numerically the distribution  $P(\theta | X_T, m)$  as well as distributions of functions of the parameter vector  $\theta$  (e.g., impulse response functions), see An and Schorfheide (2007). As discussed in Geweke (1999), Bayesian inference also provide tools to compare the fit of various models. For a given model  $m$ , the marginal likelihood is:

$$L(X_T | m) = \int_{\theta \in \Theta} L(X_T | \theta, m)P(\theta | m)d\theta, \quad (13)$$

which gives an indication of the overall likelihood of a model conditional on observed data. Below we discuss the priors employed in our estimation and an analysis of the posterior distribution for the parameters of greatest interest to us.

#### 4.1. Calibration and Prior Distributions

We will focus exclusively on the parameters related to public spending externalities. The interested reader can find all the details in Ercolani and Valle e Azevedo (2012); in particular, the values of the parameters that are fixed (calibrated) and the prior distributions employed. Concerning the choice of the priors, we refer that they are independent and we keep them mostly uninformative, i.e., we don't favor disproportionately any particular value of the parameters while centering them around values common in the literature. This is specially true in what regards the parameters related to government spending externalities. The utility parameter  $\varphi$  follows a uniform distribution (equal probability) with support in  $[0,1]$ . Concerning the parameter  $\nu = \exp(\nu\_b)$  we decide to reparametrize it such that  $\nu = \exp(\nu\_b)$ , where now  $\nu\_b \in (-\infty; \infty)$ . Then, in assigning the prior to  $\nu\_b$  we want to be as agnostic as possible, so we decide again for a uniform distribution with support in  $[-4,20]$  (meaning that  $\nu$  is in the range  $[0,018$ , almost perfect substitutes], say), which covers a wide range of possibilities in the complementarity/separability space.<sup>8</sup> Regarding the choice for the prior mean of  $\theta_g$  (or  $\theta_{g,def}$ ), we also hold to uniform distributions with support in  $[0,4]$ .

#### 4.2. Estimation Results

This section presents the estimation results. We analyze various versions of the model, focusing on the following variations:

<sup>7</sup> Interestingly, Fernandez-Villaverde (2010) analyzes the effects of fiscal policy within a DSGE model with financial frictions.

<sup>8</sup> The aim is to avoid providing prior information in favor either of substitutability or of complementarity.

- Full-sample, *i.e.* from 1969Q1 through to 2008Q3 or only the so-called “Great Moderation”, *i.e.* from 1984Q1 through to 2008Q3

- Restricted models: without public spending externality channels ( $\varphi = 1$ ,  $\theta_g = 0$ ,  $\theta_{g,def} = 0$ ), with the utility function channel only ( $\theta_g = 0$ ,  $\theta_{g,def} = 0$ ), with the production function channels only ( $\varphi = 1$ ) and, within this one, consideration of no output effects of defense investment ( $\varphi = 1$ ,  $\theta_{g,def} = 0$ ).

Table I reports some selected estimated specifications for the full sample, the associated values for the marginal data density, and a summary of the posterior (mean and mode) of the externalities’ parameters. The model with the highest marginal data density is the one with the productivity of public capital’s channel closed. This specification reveals that government consumption affects the marginal utility of consumption, since  $\varphi$  is estimated to be less than 1, and that government and private consumption are substitute goods. In fact, the high estimated value for  $\nu\_b$  implies a very high elasticity of substitution between private and government consumption. Given these results,  $U_{cg}$  in equation (Ucg) is unambiguously negative. Focusing now on those specifications where  $\theta_g$  and  $\theta_{g,def}$  are estimated, we underline the following facts: first, the estimates for  $\varphi$  and  $\nu\_b$  are very close to the ones obtained in the version where  $\theta_g$  and  $\theta_{g,def}$  are restricted to 0. Second, whenever estimated, both the mean and the mode of  $\theta_{g,def}$  are 0. Third, in some specifications the *posterior mean* of  $\theta_g$  is above 0, ranging from 0.09 to 0.28. Finally, models with  $\theta_{g,def}$  restricted to 0 are very clearly preferred to models with  $\theta_{g,def}$  left unrestricted.<sup>9</sup>

All in all, the results suggest clear evidence of strong substitutability between public consumption and private consumption and mixed evidence on the positive effects of non-defense public investment on private sector productivity, and hold also in the post ‘84 sample. Indeed, the 90% posterior intervals associated to  $\varphi$  and  $\nu\_b$  are tight around the estimated mean, while the one for  $\theta_g$  is much wider (see Ercolani and Valle e Azevedo, 2012 for more details). Next, we turn to the analysis of the dynamics of the estimated model with the highest marginal data density, comparing several impulse responses to what obtains in the case of separable government consumption.

**Table 1**

POSTERIOR MEAN AND MODE OF EXTERNALITIES PARAMETERS											
Parameter	POSTERIOR post 1969										No Channels
	$\theta_{g,def}=0$						$\theta_{g,def}$ Unrestr.				
	$\varphi=1$		$\theta_g=0$		unrestr.		$\varphi=1$		unrestr.		
	Mode	Mean	Mode	Mean	Mode	Mean	Mode	Mean	Mode	Mean	
A. Utility function											
$\nu\_b = \log(\nu)$	-	-	7.9	10.2	7.6	10.7	-	-	8.1	10.5	
$\varphi$	-	-	0.65	0.63	0.65	0.63	-	-	0.65	0.61	
B. Production function											
$\theta_g$	0.0	0.0	-	-	0.0	0.09	0.0	0.28	0.0	0.0	
$\theta_{g,def}$	-	-	-	-	-	-	0.0	0.0	0.0	0.0	
Laplace Log Data Dens.	2522.3		2544.8		2539.6		2518.9		2518.5		2541.4
Log Data Dens.	2534.9		2555.1		2551.6		2534.7		2533.3		2548.3

**Source:** Authors’ calculations.

<sup>9</sup> We should refer that we have also estimated versions of the model with public investment not split into defense and non-defense items. In this case, estimates of the posterior mode and mean of the parameter measuring the productivity of public investment,  $\theta_g$ , were almost always exactly 0. This indicates perhaps the increased difficulty of identifying public investment as a shifter of productivity once defense and non-defense items are considered jointly.

### 4.3. Impulse-Response Analysis

In this section we study the dynamics of the economy where the only externality channel is represented by non separable government consumption. Figure 1 describes the estimated model variables' reactions to a government consumption shock in the first 100 quarters after the shock. The size of the shock is set to the estimated *posterior mean* of the standard deviation and the impulse response functions are expressed as percentage points of steady-state deviations. Each plot presents two lines, a black and a dark grey one. The black one is the *posterior mean* of the estimated responses and is named *Posterior Mean*. The dark grey line is the reaction obtained by fixing all the parameters at the respective *posterior mean*, with the difference that the "externality" parameter,  $\phi$ , is set to 1. The latter summarizes the reactions when the externality channel is shut down, and is labeled *No Channels*.<sup>10</sup> The shaded area within each plot draws the 80% Bayesian posterior credibility interval of the estimated impulse response functions.

The behavior of the variables in Figure 1 can be explained as follows: because of substitutability, the increase in government consumption lowers the marginal utility of consumption, leading households to substitute part of their private consumption with the newly available government consumption. As a consequence, private consumption (black line) decreases more than private consumption in the *No Channels* specification (dark grey line). That is, in the estimated model, both the negative wealth effect and the substitutability effect sum up. Additionally, because of substitutability households work less since - for given negative wealth effect - the marginal utility of consumption is lower than in the *No Channels* model. As a result, wages decrease less. Importantly, the impact on output is smaller in the estimated model because of the lower increase in labor supply. To accommodate the new path for private consumption, the real interest rate increases by less on impact, so that investment is crowded-out less. Notice that Ercolani and Valle e Azevedo (2012) includes also the analysis of the dynamic effects generated by a shock to government investment.

The next section completes the quantitative analysis, resorting to the analysis of dynamic multipliers induced by non separable government consumption.

### 4.4. Dynamic Multipliers

We analyze here public spending multipliers associated with the estimated effects of a government consumption shock on output, consumption and investment. We use the notion of present value multipliers formulated in Mountford and Uhlig (2009); the present value multiplier of output, say,  $t$  quarters after an increase in government consumption is:

$$\phi_t = \frac{\sum_{k=1}^t (1 + r_{ss})^{-k} \Delta y_k}{\sum_{k=1}^t (1 + r_{ss})^{-k} \Delta g_k}$$

where  $\Delta y_k$  represents the actual deviation of stationarized output from its steady-state at time  $k$ ,  $\Delta g_k$  represents the actual deviation of stationarized public consumption from its steady-state at time  $k$  and  $r_{ss}$  is the steady-state real interest rate on the risk free asset. The expression generalizes for the case of consumption and investment.

Table II shows the present value multipliers for  $Y$ ,  $C$  and  $I$  and for various periods in response to a government consumption shock. We look at the *posterior mean* of the multipliers and also at an 80% Bayesian credibility interval. Further, the corresponding *No Channels* multipliers are reported.

<sup>10</sup> Hence, this restricted model is not estimated in order to guarantee that the only parameters changing are those related to public spending externalities. However, we should note that the estimated *posterior mean* of the impulse response functions obtained with the imposed restrictions are very similar to the reported ones.

Chart 1 (continue)

IMPULSE RESPONSE FUNCTIONS: EFFECTS ON OUTPUT (Y), CONSUMPTION (C), INVESTMENT (I), WAGES (W), HOURS (L) AND RETURN ON CAPITAL ( $R^k$ ) OF A GOVERNMENT CONSUMPTION SHOCK

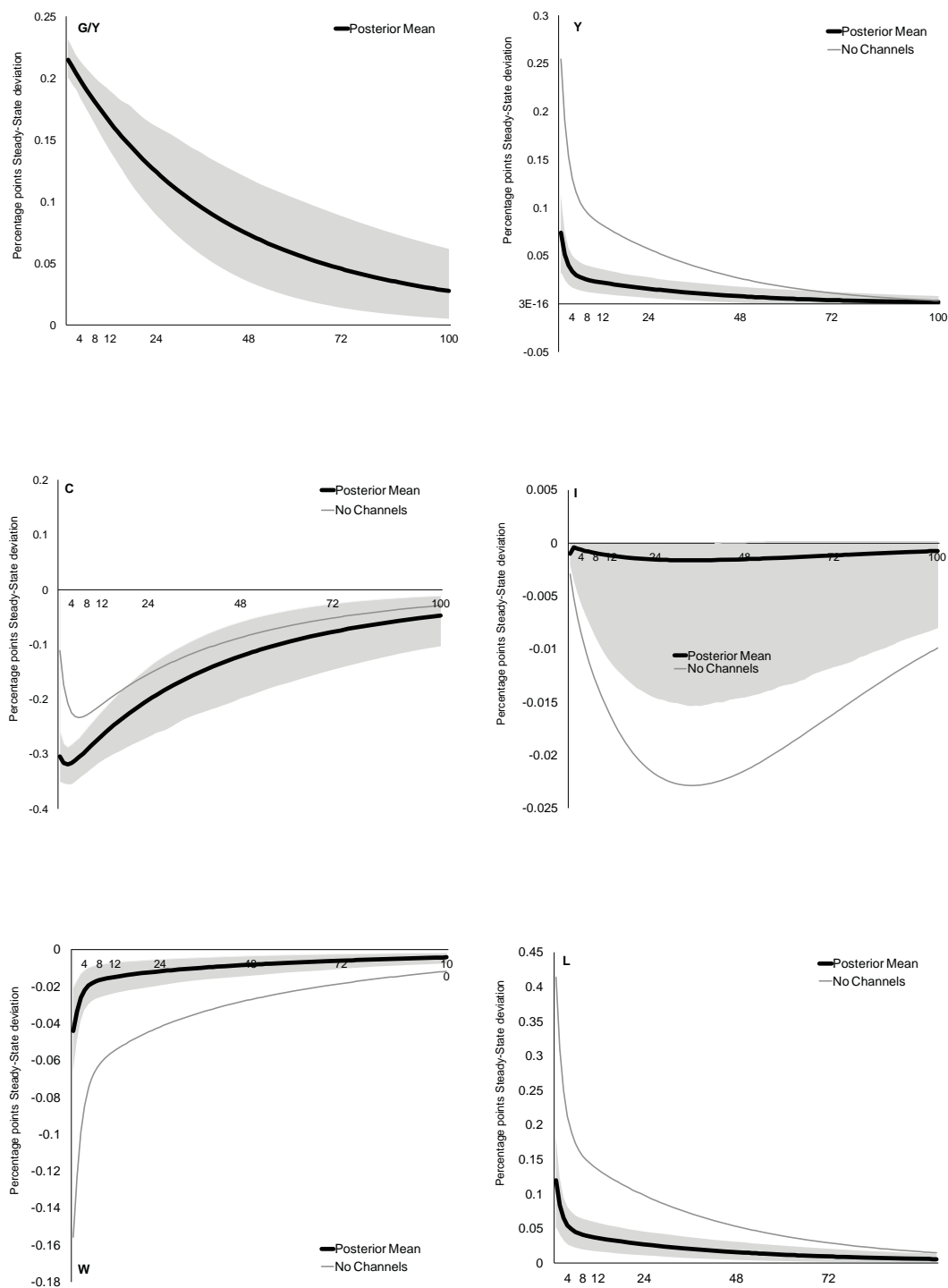
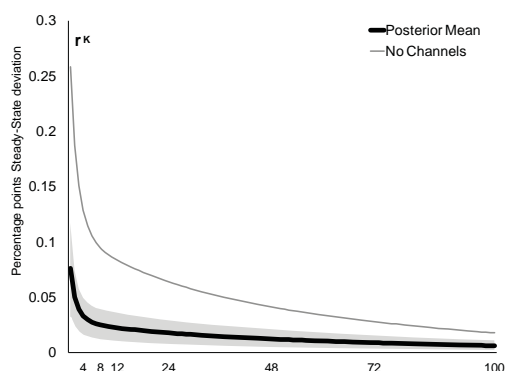


Chart 1 (continuation)

IMPULSE RESPONSE FUNCTIONS: EFFECTS ON OUTPUT (Y), CONSUMPTION (C), INVESTMENT (I), WAGES (W), HOURS (L) AND RETURN ON CAPITAL ( $R^k$ ) OF A GOVERNMENT CONSUMPTION SHOCK



**Source:** Authors' calculations.

**Notes:** The government consumption shock is equal to the estimated standard deviation. The black line is the posterior mean of the IRF and denoted by *Posterior Mean*. The grey area is the associated 80% Bayesian credibility interval. The dark grey line is the IRF obtained with the "externality" channel closed (i.e.  $\phi = 1$ ) and the other parameters set to the posterior mean obtained from the estimated model (denoted by *No Channels*).

The estimated output multiplier reaches its maximum at 0.33 on impact, and then slowly decreases. The output multiplier calculated within the *No Channels* specification turns out to be 0.99 on impact, i.e. three times bigger than the one generated by non separable government consumption. Our estimated multiplier is close to the impact output multiplier found by Mountford and Ugh (2009), which equals 0.31. This is obtained within a VAR identified through sign restrictions, where taxes are forced to adjust so as to fully finance the increase in government spending during the first four quarters after the shock. Clearly, our 80% posterior interval does not even contain the impact values found by Blanchard and Perotti (2002), which are 0.90 (under a deterministic detrending of the data) and 0.84 (under a stochastic one).<sup>11</sup>

As expected, the multipliers for consumption and investment are negative, though the 80% posterior interval for investment contains zero. In the case of consumption the multipliers are clearly below those obtained in the *No Channels* model, especially at short horizons, whereas for investment they are above, but still negative. Notice that Ercolani and Valle e Azevedo (2012) includes the analysis of the multipliers generated by a shock to government investment.

<sup>11</sup> It is worth noting that many of the analyzes of the effects of government spending focus on military spending, instead of government consumption, as it is unlikely that this type of expenditures is endogenous. Among others, Barro and Redlick (2010) estimate an output multiplier ranging from 0.6 to 0.7 at the median unemployment rate (reaching 1.0 when the unemployment rate is around 12%); also, they find a crowding out effect for investment and net exports. Hall (2009)'s range for the output multiplier is 0.7-1.0. Finally, Ramey (2011), using news shocks obtained with a narrative approach, finds output multipliers in the range 0.6-1.2 (at peak GDP) and slightly negative consumption multipliers.



Table 2

DYNAMIC MULTIPLIERS, ESTIMATED VS NO CHANNELS MODEL, GOVERNMENT CONSUMPTION SHOCK									
Quarters	1	2	4	8	12	24	48	72	100
Y Estimated	0.33	0.28	0.25	0.19	0.17	0.16	0.14	0.14	0.13
	(0.14,0.50)	(0.12,0.43)	(0.11,0.35)	(0.09,0.29)	(0.08,0.27)	(0.07,0.25)	(0.06,0.24)	(0.05,0.24)	(0.04,0.24)
Y No Channels	0.99	0.89	0.77	0.65	0.60	0.55	0.51	0.49	0.48
C Estimated	-0.75	-0.79	-0.82	-0.85	-0.86	-0.87	-0.89	-0.89	-0.90
	(-0.87,-0.64)	(-0.89,-0.68)	(-0.92,-0.73)	(-0.96,-0.77)	(-0.98,-0.75)	(-1.04,0.73)	(-1.13,-0.67)	(-1.19,-0.63)	(-1.24,-0.61)
C No Channels	-0.24	-0.32	-0.43	-0.52	-0.56	-0.61	-0.63	-0.64	-0.65
I Estimated	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.003	-0.003
	(-0.002,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)	(-0.003,0.000)
I No Channels	-0.003	-0.004	-0.005	-0.009	-0.012	-0.019	-0.029	-0.035	-0.039

**Source:** Authors' calculations.

**Notes:** 80% Bayesian credibility interval in parenthesis.

## 5. Conclusions

This article has posed attention on the potential externalities produced by public expenditures, focusing on how these externalities affect the response of the economy to two government spending shocks: a government consumption shock and a government investment shock. To this effect, we have built an otherwise standard flexible prices model extended with two important features. First, we have allowed government consumption to affect the welfare of agents, by entering directly households' utility function. Second, we have allowed public capital to shift the productivity of private factors, by entering in the firms' production function.

On the one hand, our results question the standard hypothesis of separability between private and government consumption, as the two goods are robustly estimated to be substitutes. Because of substitutability labor supply reacts little to a government consumption shock, so the estimated output multiplier is lower (approximately one third) than the one measured in models with separable government consumption. On the other hand, we find that non-defense public investment enhances mildly, in some specifications, the productivity of private factors while investment in defense appears not to have any such impact. When non-defense public investment is found to shift the production frontier, shocks to it generate non-standard responses that manifest themselves only after several quarters (a positive reaction of private consumption, Tobin's  $q$ , private investment and real wages). Further, the estimated output multiplier builds up over time, in contrast to what obtains in the corresponding model with unproductive government investment. These results show that incorporating the channels we study into general equilibrium models can be important to understand and measure more thoroughly the expected impacts of fiscal stimuli and consolidations, as well as to conduct welfare analysis of fiscal policy.

Finally, it will be worth investigating how our measures interact with several important features of fiscal and monetary policy such as debt smoothing details, implementation delays, or the zero lower bound on nominal interest rates.

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## Appendix: Data

We follow closely Smets and Wouters (2007) in treating the data. We use the September 30, 2010 vintage of data. The tables below clarify sources and transformations.

Table 1

DATA SOURCES			
Variable	Designation	Source	CODE
Gross Domestic Product (Nominal)	GDP	U.S. Dep. of Commerce - BEA	A191RC1
Personal Cons. Expenditures (Nominal)	C	U.S. Dep. of Commerce - BEA	DPCERC1
Personal Cons. Expenditures - Durables (Nominal)	Durables	U.S. Dep. of Commerce - BEA	DDURRC1
Private Fixed Domestic Investment (Nominal)	PFI	U.S. Dep. of Commerce - BEA	A007RC1
Federal Cons. Expenditures (Nominal)	G_Federal	U.S. Dep. of Commerce - BEA	A957RC1
State & Local Cons. Expenditures (Nominal)	G_StateLocal	U.S. Dep. of Commerce - BEA	A991RC1
Federal Gross Investment, Non-Defense (Nominal)	IG_Federal	U.S. Dep. of Commerce - BEA	A798RC1
Federal Gross Investment, Defense (Nominal)	IG_Defense	U.S. Dep. of Commerce - BEA	A788RC1
State & Local Gross Investment (Nominal)	IG_StateLocal	U.S. Dep. of Commerce - BEA	A799RC1
Gross Domestic Product Deflator	GDPDEF	U.S. Dep. of Commerce - BEA	GDPDEF
Hourly Compensation, Non Farm Sector (Nominal)	Wages	Bureau of Labor Statistics	PRS85006103
Civilian noninstitutional population, 16 years and over	POPULATION	Bureau of Labor Statistics	LNU00000000Q

**Note:** All series are seasonally adjusted at annual rates.

Table 2

### D2 - OBSERVABLES FOR MEASUREMENT EQUATIONS

$$Y_t^{obs} = (GDP/GDPDEF)/POPULATION$$

$$C_t^{obs} = ((C - Durables)/GDPDEF)/POPULATION$$

$$I_t^{obs} = ((PFI + Durables)/GDPDEF)/POPULATION$$

$$W_t^{obs} = (Wages/GDPDEF)/POPULATION$$

$$\xi_t^{g, obs} = (G\_Federal + G\_StateLocal)/GDP$$

$$\xi_t^{ig, obs} = (IG\_Federal + IG\_StateLocal)/GDP$$

$$\xi_t^{ig, def, obs} = IG\_Defense/GDP$$

# PRODUCT SWITCHING OR RE-CLASSIFICATION? AN APPLICATION TO PORTUGUESE INTERNATIONAL TRADE\*

Rúben Branco\*\* | Luca David Opromolla\*\*\*



## ABSTRACT

Empirical researchers increasingly use highly disaggregated product-level data to study trends in exports, imports, and domestic production. However, frequent updates of the classification systems make it difficult to distinguish true product-switching behavior from spurious changes to the product mix. In this paper, we present and discuss Van Beveren, Bernard and Vandenbussche (2012)'s methodology (based on the algorithms developed by Pierce and Schott, 2012) for creating consistent product codes for EU trade data over time and apply it to the study of Portuguese international trade trends.

## 1. Introduction

Empirical researchers increasingly use highly disaggregated product-level or firm-product-level data to study trends in exports, imports, and domestic production. Three prominent examples are Schott (2004), Hummels and Klenow (2005), and Bernard *et al.* (2009).

Schott (2004) shows that although the United States source the same products from both high- and low-wage countries, unit values within products vary systematically with exporter relative factor endowments and production techniques. Thanks to the availability of finely classified product data, Schott (2004) can conclude that factor-proportions specialization is rejected across products but not within products.<sup>1</sup>

Hummels and Klenow (2005) use data on shipments by 126 exporting countries to 59 importing countries in 5,000 product categories to study how large economies export more (in absolute terms) than do small economies. They find that a wider set of goods accounts for around 60 percent of the greater exports of larger economies. Moreover, within categories, richer countries export higher quantities at modestly higher prices.<sup>2</sup>

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1 Imports are classified according to seven-digit Tariff Schedule of the United States (TS7) codes from 1972 through 1988 and according to the ten-digit Harmonized System (HS10) codes from 1989 through 1994.

2 They use two sources of export data. Worldwide data come from the United Nations Conference on Trade and Development (UNCTAD) Trade and Analysis Information System (TRAINS) CD-ROM for 1995. The data are reported in the Harmonized System classification code at the six-digit level. They also use data with more product detail from the "U.S. Imports of Merchandise" CD-ROM for 1995, published by the U.S. Bureau of the Census.

Firm-product-level data have been particularly useful for examining the extent to which firms' growth in output, exports or imports occurs at the "extensive margin" versus the "intensive margin", *i.e.* the degree to which growth takes place via product-adding and dropping or within surviving products. Bernard *et al.* (2009) find that most of the year-to-year changes in U.S. trade values occurred along the intensive margin associated with surviving products, rather than the extensive margin associated with product-adding and dropping.<sup>3</sup>

While finely disaggregated product-level data become more and more accessible, studies using them have to deal with the fact that government authorities frequently update product classification systems. As a result, underlying physical goods may be classified in different categories over time and it might be difficult for researchers to properly distinguish true product-switching behavior from spurious changes to the product mix.<sup>4</sup> Pierce and Schott (2012) address these concerns for U.S. data and provide a methodology for creating consistent product codes for trade data over time. Van Beveren, Bernard and Vandenbussche (2012) adapt Pierce and Schott (2012)'s methodology for use with European Union (EU) production and trade data, and examine the implications of changing product classifications on measured product adding and dropping at Belgian firms.

In this paper, we present and discuss Van Beveren, Bernard and Vandenbussche (2012)'s methodology and apply it to the study of Portuguese international trade trends.

## 2. Data and methodology

In the first part of this section, we describe the product classification system used to record trade flows by every member state of the EU, and the concordance methodology used to make the product classification consistent over time. In the second part of the section, we describe the database of trade flows of all firms located in Portugal used in this study.

### 2.1. Combined nomenclature and concordance methodology

EU statistics register the value and quantity of internationally traded goods (i) between Member States of the EU (intra-EU trade) and (ii) by EU Member states with non-EU countries (extra-EU trade). Data on extra-EU trade are collected from customs, while data on intra-EU trade are collected through the Intrastat system, which, in 1993, replaced customs declarations as the source of trade statistics within the EU. When declared to customs in the European Community, goods must be classified according to the Combined Nomenclature (CN). This determines which rate of customs duty applies and how the goods are treated for statistical purposes. The CN is a method for designating goods and merchandise, established to meet, at one and the same time, the requirements both of the Common Customs Tariff and of the external trade statistics of the Community.<sup>5</sup> The CN is also used in intra-Community trade statistics and is comprised of the Harmonized System (HS) nomenclature, run by the World Customs

<sup>3</sup> They use the United States Linked/Longitudinal Firm Trade Transaction Database (LFTTD), which links individual U.S. trade transactions to U.S. firms. Trade transactions are recorded at the same level of disaggregation as in Schott (2004). They use a time-consistent set of HS codes developed by Pierce and Schott (2012) to eliminate spurious product-country adding and dropping due to change in HS classification over time. This issue is the main subject of our article.

<sup>4</sup> Amador and Opromolla (2013) study the joint destination-product strategies of manufacturing firms located in Portugal in the period 1995–2005, and find that surviving destination-product pairs are crucial in driving the year-to-year variation in exports of surviving exporters. They use a coarse level of product aggregation (HS 4-digits) in order to minimize the problems associated with changes in the HS classification over time.

<sup>5</sup> The basic regulation underlying the CN system is Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff. An updated version of the Annex I to the Combined Nomenclature Regulation is published as a Commission Regulation every year in the L-series of the Official Journal of the European Communities.

Organisation (WCO), with further Community subdivisions. The Harmonized System forms the basis for international trade negotiations, and is applied by most trading nations. Each CN subdivision has an eight-digit code number, the CN8 code. The first six digits of the CN code correspond to the HS nomenclature. The European CN8 classification system is therefore an (8-digit) extension of the HS6 classification system, analogous to the ten-digit extensions (HS10) employed by the United States.

The coverage of the CN, *i.e.* the type of goods that are considered, has not changed over time. However, the CN classification is updated every year, so that each particular physical good may receive different CN8 codes over time. Such updates may be motivated by changes internationally agreed upon, either at the WCO with regard to the HS6 classification, or at the World Trade Organization (WTO) with regard to conventional rates of duty. Other changes may occur to reflect the evolution of commercial policy, technology or statistical requirements.

Table 1 reports the structure of the CN classification over time.<sup>6</sup> The number of CN8 products goes from a minimum of 10,096 in 2005 to a maximum of 10,606 in 1997. The table further shows the number of codes associated with each version of the HS6 classification. Our sample period spans three different HS6 classifications since this was updated in 1996 and 2002.

The concordance methodology that we apply to make the CN8 classification consistent over time was introduced by Van Beveren, Bernard and Vandenbussche (2012), and is based on Pierce and Schott (2012). In this section we provide the intuition underlying the concordance methodology, and relegate technical details to the Annex. We refer to the “effective year” as the year in which a particular change in the CN8 classification becomes effective. “Obsolete” refers to codes that are totally or partially replaced starting in the effective year and “new” refers to the codes that replace them.

Building a product classification that is consistent over time requires the use of concordance files. Eurostat provides these files every time the CN classification is updated. Concordance files are lists of “mappings” between obsolete and new codes. Mappings can be “simple” or “complex”. Simple changes make no adjustments to the actual items covered by a particular code; they just swap one eight-digit

**Table 1**

STRUCTURE OF THE COMBINED NOMENCLATURE CLASSIFICATION		
Combined Nomenclature 8-digit (CN8)		Harmonized System 6-digit (HS6)
Year	# of CN8 codes	
1995	10,448	HS6 1992 (5,018 codes)
1996	10,495	
1997	10,606	
1998	10,587	
1999	10,428	
2000	10,314	HS6 1996 (5,113 codes)
2001	10,274	
2002	10,400	
2003	10,404	
2004	10,174	
2005	10,096	HS6 2002 (5,224 codes)

**Source:** Eurostat (Classification files from Ramon server).

**Notes:** This table shows the number of CN8 and HS6 codes for each year in the period 1995-2005. HS6 codes have been revised in 1996 and 2002, while CN8 codes are revised every year.

<sup>6</sup> Most classifications and concordance tables are available for download on the European Union's classification metadata server, *i.e.* the Ramon server (<http://ec.europa.eu/eurostat/ramon/>).

code for another. In contrast to simple changes, complex changes alter the mix of items captured by a particular code. For these changes, the items formerly encompassed by one or more obsolete codes are distributed to one or more “new” codes. The development of an over-time consistent concordance starts with the assignment of a unique identifier – a “synthetic” code – to all codes (new and obsolete) involved in a same mapping present in a concordance file. Specifically, if obsolete codes  $a$  and  $b$  from  $t-1$  map into new code  $c$  in  $t$ , the two obsolete codes and the new code need to be “grouped” in a synthetic code. It is then necessary to search for chains of code changes over time. Suppose now, that code  $c$  in turn maps into codes  $d$ ,  $e$ , and  $f$  in  $t+3$ . Codes  $a$ ,  $b$ ,  $c$ ,  $d$ ,  $e$ , and  $f$  then need to be assigned to the same synthetic code, in all years. In other words, consecutive changes in codes (new codes in some year becoming obsolete in a later year) need to be chained together in “family trees”.

## 2.2. Trade data

The “European Statistical System” (ESS) collects and disseminates statistics in the European Union. The ESS is the partnership between the Community statistical authority, which is the Commission (Eurostat), and the national statistical institutes (NSIs) and other national authorities responsible in each Member State for the development, production and dissemination of European statistics. This Partnership also includes the EEA and EFTA countries.<sup>7</sup> Statistics Portugal (*INE*) collects, on a monthly basis, data on export and import transactions by firms that are located in Portugal.

For the purpose of this research, we were able to gain access to data from 1995 to 2005. The same information employed in this article is used for official statistics and, besides small adjustments, aggregates to the official total exports and imports of Portugal. Each transaction record includes, among others, the firm’s tax identifier, a CN8 product code, the destination/origin country, the value of the transaction in euros, the quantity (in kilos and, in some cases, in additional product-specific measuring units) of transacted goods, and the relevant international commercial term (FOB, CIF, FAS, etc.). For extra-EU trade, all transactions whose value is higher than €1,000 or whose weight is greater than 1,000kg have to be reported. In the case of intra-EU trade, and in the period under study, firms are required to provide information on their trade transactions if the volume of exports or imports in the current year or in one of the previous two years was higher than about 60,000 euros and 85,000 euros, respectively.<sup>8</sup>

In this article, we use data on all export and import transactions of firms located in continental Portugal and that imply a transfer of ownership.<sup>9</sup> In the analysis, we aggregate data at the product-year or country-product-year level. At the country-year-level, our data aggregate, on average, to within 2 percent of the data reported by *INE*.

## 3. Results

This section divides into two parts. First, we illustrate the importance of controlling for CN code reclassifications when measuring product adding and dropping in Portuguese export and import data. Second, we use the post-concordance data to show trends in the number of exported (imported) products to (from) several key groups of countries.

<sup>7</sup> See [http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp\\_ess/about\\_ess](http://epp.eurostat.ec.europa.eu/portal/page/portal/pgp_ess/about_ess) for a description of ESS and the list of NSIs and other authorities.

<sup>8</sup> In the case of intra-EU trade, firms have the option of “adding up” multiple transactions only when they refer to the same month, product, destination/origin country, Portuguese region and port/airport where the transaction originates/starts, international commercial term, type of transaction (sale, resale,... etc.), and transportation mode. Intra-EU trade reporting thresholds are substantially stable over the period 1995–2005. More information can be found at: <http://webinq.ine.pt/public/files/inqueritos/pubintrastat.aspx?id=168>.

<sup>9</sup> As such, we include both manufacturing and non-manufacturing firms in the analysis. It should be emphasized that trade data only refer to traded goods and not traded services.



In both parts, we define a product as added if it is exported (imported) in  $t$  but not in  $t-1$ . Conversely, the product is dropped if it is exported (imported) in  $t-1$  but not in  $t$ . Finally, a product is continuing if it is exported (imported) both in  $t-1$  and in  $t$ .

### 3.1. The effect of the concordance on the measurement of product adding and dropping

Tables 2 and 4 show the number of added, dropped, and continuing – exported or imported – products, before and after applying the concordance. After applying the concordance, (i) a subset of products originally classified as added or dropped are re-classified as continuing; (ii) the total number of exported or imported products declines due to the grouping of codes into families.<sup>10</sup>

The concordance procedure heavily affects the pattern and net impact of product adding and dropping along the sample period. First, the application of the concordance methodology substantially reduces the importance of the product margin in driving year-to-year exports and imports. Tables 2 and 4 show that added products represent, on average across the sample period, 12.4 (6.3) percent of the products exported (imported) in the previous year, before the concordance, and only 9.0 (2.9) percent after the concordance. The number of dropped products also declines from 11.9 (6.4) percent of the number of exported (imported) products to 8.2 (2.6) percent. Tables 3 and 5 show that the change in added and dropped products as a percentage of exports or imports (in the beginning year) is even bigger. Before applying the concordance, added and dropped products represent, on average, 2.9 (3.9) and 3.0 (3.8)

Table 2

ADDED, DROPPED, AND CONTINUING EXPORTED PRODUCTS—BEFORE AND AFTER THE CONCORDANCE, 1995–2005												
	( <i>t</i> –1– <i>t</i> )	1995–1996	1996–1997	1997–1998	1998–1999	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	Average 95–05
Added ( <i>t</i> )	w/o	1,408 (19.9)	954 (13.2)	801 (10.9)	824 (11.6)	843 (11.9)	753 (10.6)	1,126 (15.7)	628 (8.5)	880 (12.0)	747 (10.1)	896.4 (12.4)
	w/	635 (10.4)	637 (10.3)	450 (7.2)	565 (9.2)	611 (10.0)	584 (9.4)	565 (9.0)	492 (7.7)	548 (8.6)	532 (8.2)	561.0 (9.0)
Dropped ( <i>t</i> –1)	w/o	1,288 (18.2)	792.0 (11.0)	1,057 (14.3)	879 (12.4)	787 (11.1)	677 (9.5)	953 (13.2)	633 (8.6)	812 (11.0)	684 (9.2)	856.2 (11.9)
	w/	565 (9.2)	549 (8.9)	626 (10.0)	554 (9.1)	495 (8.1)	517 (8.3)	476 (7.6)	493 (7.7)	433 (6.8)	428 (6.6)	513.0 (8.2)
Continuing	w/o	5,802 (81.8)	6,418 (89.0)	6,315 (85.7)	6,237 (87.6)	6,274 (88.9)	6,440 (90.5)	6,240 (86.8)	6,733 (91.4)	6,549 (89.0)	6,745 (90.8)	6,375.3 (88.1)
	w/	5,563 (90.8)	5,649 (91.1)	5,660 (90.0)	5,556 (90.9)	5,626 (91.9)	5,720 (91.7)	5,828 (92.4)	5,900 (92.3)	5,959 (93.2)	6,079 (93.4)	5,754.0 (91.8)
All ( <i>t</i> –1)	w/o	7,090 (1.7)	7,210 (2.2)	7,372 (–3.5)	7,116 (–0.8)	7,061 (0.8)	7,117 (1.1)	7,193 (2.4)	7,366 (–0.1)	7,361 (0.9)	7,429 (0.8)	7,231.5 (0.6)
	w/	6,128 (1.1)	6,198 (1.4)	6,286 (–2.8)	6,110 (0.2)	6,121 (1.9)	6,237 (1.1)	6,304 (1.4)	6,393 (0.0)	6,392 (1.8)	6,507 (1.6)	6,267.6 (0.8)

Sources: Eurostat (Classification files from Ramon server), INE (Trade data) and authors' calculations.

Notes: The top part of this table shows the number of added/dropped/continuing products (and, in parenthesis, the relative frequency with respect to the number of products in  $t-1$ ) exported by Portugal, for each pair of subsequent years between 1995 and 2005. Added, dropped, and continuing products are defined in section 3. The bottom part of the table shows the total number of products exported in year  $t-1$ , and, in parenthesis, its growth rate between  $t-1$  and  $t$ . Rows marked with (w/o) and (w/) refer to pre- and post-concordance figures, respectively.

<sup>10</sup> Based on tables 2 and 4, we find that the number of added products declines by, on average, 37 percent (62 percent) in the case of exports (imports). Similarly, the number of dropped products declines by 40 percent (66 percent) in the case of exports (imports). The total number of exported (imported) products declines by 13 percent (16 percent). The number of continuing products also declines, but by less than the total number of exported (imported) products.

Table 3

CONTRIBUTION OF ADDED, DROPPED AND CONTINUING PRODUCTS TO THE PERCENTAGE CHANGE IN TOTAL EXPORTS – BEFORE AND AFTER THE CONCORDANCE, 1995–2005												
	(t-1-t)	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	Average 95-05
Added	w/o	8.3	1.7	3.2	1.2	1.4	0.9	8.0	0.2	3.0	1.4	2.9
	w/	0.5	0.2	0.1	0.3	0.1	0.4	0.2	0.2	0.4	0.1	0.2
Dropped	w/o	8.4	2.3	3.3	1.4	1.4	0.9	8.1	0.2	2.3	1.9	3.0
	w/	0.1	0.8	0.3	0.2	0.2	0.3	0.1	0.2	0.2	0.4	0.3
Continuing	w/o	9.3	11.4	6.8	3.3	14.7	2.0	2.2	1.8	3.6	1.1	5.6
		8.8	11.3	7.0	3.0	14.8	1.9	2.0	1.8	4.0	0.9	5.6
Exports		9.2	10.8	6.8	3.2	14.7	1.9	2.0	1.8	4.3	0.6	5.5

**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The top part of this table shows exports associated with added/dropped products and the change in exports associated with continuing products, between year  $t-1$  and  $t$  relative to total exports in  $t-1$ . Added, dropped, and continuing products are defined in section 3. The bottom row of the table shows the growth rate of exports between  $t-1$  and  $t$ . Rows marked with (w/o) and (w/) refer to pre- and post-concordance figures, respectively.

Table 4

ADDED, DROPPED, AND CONTINUING IMPORTED PRODUCTS—BEFORE AND AFTER THE CONCORDANCE, 1995–2005												
	(t-1-t)	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	Average 95-05
Added (t)	w/o	1,326 (14.4)	561 (6.0)	596 (6.3)	463 (4.9)	445 (4.8)	362 (3.9)	934 (10.0)	287 (3.0)	570 (6.1)	347 (3.7)	589.1 (6.3)
	w/	294 (3.8)	241 (3.1)	200 (2.6)	232 (3.0)	239 (3.1)	234 (3.0)	214 (2.7)	185 (2.3)	223 (2.8)	181 (2.3)	224.3 (2.9)
Dropped (t-1)	w/o	1,220 (13.2)	439 (4.7)	633 (6.7)	581 (6.2)	457 (4.9)	339 (3.7)	817 (8.8)	306 (3.3)	687 (7.3)	441 (4.8)	592.0 (6.4)
	w/	223 (2.9)	206 (2.6)	221 (2.8)	213 (2.7)	182 (2.3)	193 (2.4)	196 (2.5)	192 (2.4)	185 (2.3)	217 (2.7)	202.8 (2.6)
Continuing	w/o	7,990 (86.8)	8,877 (95.3)	8,805 (93.3)	8,820 (93.8)	8,826 (95.1)	8,932 (96.3)	8,477 (91.2)	9,105 (96.7)	8,705 (92.7)	8,834 (95.2)	8,737.1 (93.6)
	w/	7,509 (97.1)	7,597 (97.4)	7,617 (97.2)	7,604 (97.3)	7,654 (97.7)	7,700 (97.6)	7,738 (97.5)	7,760 (97.6)	7,760 (97.7)	7,766 (97.3)	7,670.5 (97.4)
All (t-1)	w/o	9,210 (1.2)	9,316 (1.3)	9,438 (-0.4)	9,401 (-1.3)	9,283 (-0.1)	9,271 (0.2)	9,294 (1.3)	9,411 (-0.2)	9,392 (-1.2)	9,275 (-1.0)	9,329.1 (0.0)
	w/	7,732 (0.9)	7,803 (0.4)	7,838 (-0.3)	7,817 (0.2)	7,836 (0.7)	7,893 (0.5)	7,934 (0.2)	7,952 (-0.1)	7,945 (0.5)	7,983 (-0.5)	7,873.3 (0.3)

**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The top part of this table shows the number of added/dropped/continuing products (and, in parenthesis, the relative frequency with respect to the number of products in  $t-1$ ) imported by Portugal, for each pair of subsequent years between 1995 and 2005. Added, dropped, and continuing products are defined in section 3. The bottom part of the table shows the total number of products imported in year  $t-1$ , and, in parenthesis, its growth rate between  $t-1$  and  $t$ . Rows marked with (w/) and (w/o) refer to pre- and post-concordance figures, respectively.

Table 5

CONTRIBUTION OF ADDED, DROPPED AND CONTINUING PRODUCTS TO THE PERCENTAGE CHANGE IN TOTAL IMPORTS – BEFORE AND AFTER THE CONCORDANCE, 1995–2005												
	(t-1-t)	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	Average 95-05
Added	w/o	10.4	3.3	4.9	1.7	5.0	0.6	8.7	0.3	3.3	0.5	3.9
	w/	0.1	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Dropped	w/o	10.9	2.7	4.0	1.6	6.0	0.7	8.8	0.2	2.8	0.6	3.8
	w/	0.2	0.1	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1
Continuing	w/o	9.1	11.6	13.2	7.4	14.3	2.0	-1.9	-2.4	8.7	2.4	6.4
		8.7	12.1	14.0	7.4	13.5	2.0	-2.0	-2.4	9.2	2.4	6.5
Imports		8.6	12.2	14.1	7.4	13.4	2.0	-2.0	-2.3	9.2	2.3	6.5

**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The top part of this table shows imports associated with added/dropped products and the change in imports associated with continuing products, between year  $t-1$  and  $t$ , relative to total imports in  $t-1$ . Added, dropped, and continuing products are defined in section 3. The bottom row of the table shows the growth rate of imports between  $t-1$  and  $t$ . Rows marked with (w/o) and (w/) refer to pre- and post-concordance figures, respectively.

percent of exports (imports) in the beginning year.<sup>11</sup> After applying the concordance, they represent just 0.2 (0.1) and 0.3 (0.1) percent of beginning-year exports (imports).

Second, the biggest impact occurs in those years when changes in the HS6 classification are implemented, *i.e.* 1995–1996 and 2001–2002. Overall, post-concordance statistics on added and dropped products are much less volatile over time.

Third, the growth rate in the total number of exported or imported products can actually switch sign after applying the concordance.<sup>12</sup>

### 3.2. Exports and imports growth: a product-level perspective

In the previous section we established the importance of applying the concordance methodology outlined in section 2.1 to properly analyze trends in exports and imports. In this section, we take advantage of post-concordance data to show trends in the number of exported (imported) products, and their contribution to export and import growth, to (from) several key groups of countries. Specifically, we partition countries into 7 mutually exclusive and exhaustive sets: Spain, Germany, Other EU, Other OECD, countries belonging to the Community of Portuguese Language Countries (CPLP in Portuguese), China, and the Rest of the World.<sup>13</sup> This partition is motivated by geographical, economic, and historical reasons.

Table 6 shows, for each group of countries, a snapshot, at the beginning and end of the sample period, of two measures of intensity of the trade link with Portugal. The first measure is the number of products imported from (exported to) Portugal as a share of Portugal's overall export (import) portfolio of product types. The second measure is simply each country's share in Portugal's total exports or imports.

Charts 1 and 2 show instead, for each country group, the evolution over time of the number of products exported and imported (measured on the left axis), as a consequence of product adding and dropping (measured on the right axis).<sup>14</sup> The number of exported products exhibits a positive trend in all destination groups, with an average accumulated increase of 79 percent in 1995–2005 (Chart 2). Charts 3 and 4 show the evolution over time of the growth rate of exports and imports (measured on the left axis), as well as the contribution of added and dropped products (measured on the right axis). Both growth rates of exports and imports are lower in the second half of the sample than in the first half, with the exception of those associated to China and the countries belonging to the Community of Portuguese Language Countries.<sup>15</sup> The contribution of added and dropped products to the growth rate of exports (or imports) is generally low, in the order of 1 or 2 percent, again with the exception of China and the CPLP countries, which show a more volatile dynamics. Consistently with the literature, the growth rates of total exports (imports) follow the dynamics in the growth rate of exports (imports) associated with surviving products.

<sup>11</sup> We do not deflate trade volumes, for two reasons. First, product-level deflators are not available. Second, our main results would not change since we aim at comparing the contribution to exports (or imports) of added and dropped products with and without the concordance.

<sup>12</sup> This occurs, for example, in 1998–1999 and 2002–2003 for exports, and in 1998–1999, 1999–2000, and 2003–2004 for imports.

<sup>13</sup> “Other EU countries” includes Austria, Belgium-Luxembourg, Denmark, Finland, France, Greece, Italy, Ireland, Netherlands and Sweden, and United Kingdom; “Other OECD countries” includes United States, Australia, Canada, Switzerland, Czech Republic, Hungary, Iceland, Japan, Republic of Korea, Mexico, Norway, New Zealand, Poland, Slovak Republic, and Turkey; “CPLP countries” include Brazil, Angola, Cape Verde, Guinea-Bissau, Mozambique, Sao Tome and Principe, and Timor-Leste.

<sup>14</sup> The plot referring to the group “Rest of the World” has been omitted to save space but is available upon request to the authors.

<sup>15</sup> Note the difference in the scale of the axis of the plots associated with China and the countries belonging to the Community of Portuguese Language Countries.

Table 6

## NUMBER OF EXPORTED AND IMPORTED PRODUCTS AND ASSOCIATED TRADE SHARES, BY COUNTRY GROUP, 1995–2005

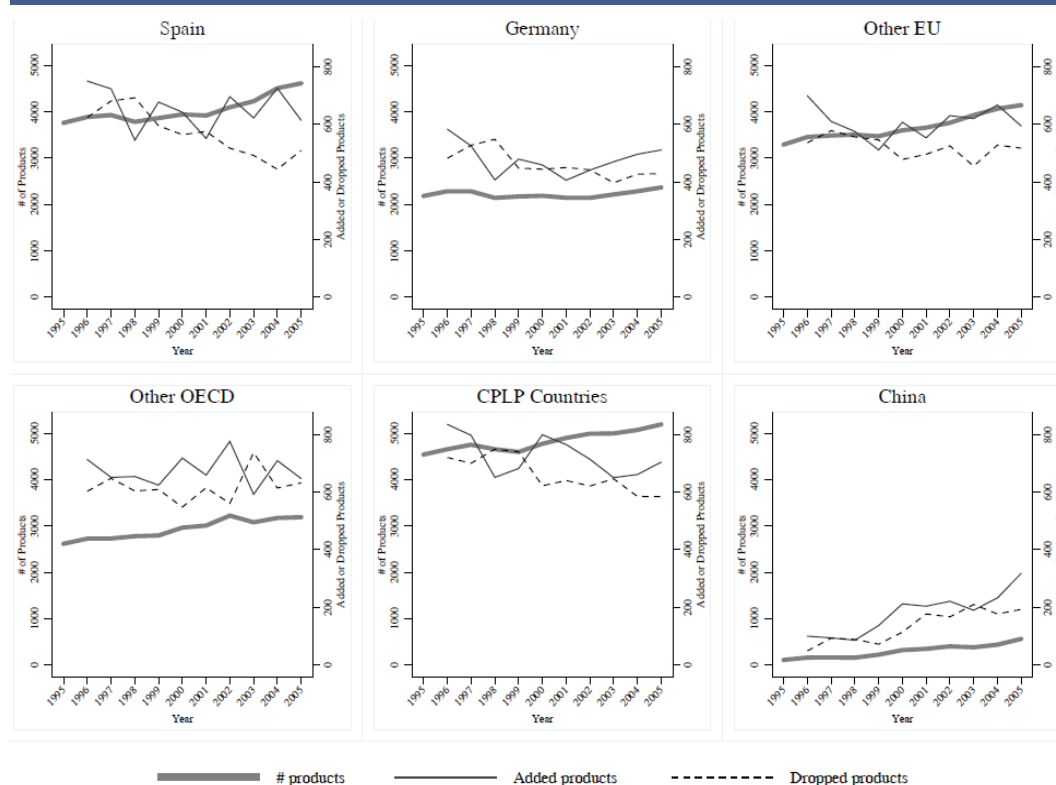
	# of Products				Trade Share			
	Exports		Imports		Exports		Imports	
	1995	2005	1995	2005	1995	2005	1995	2005
Spain	3,763 (61.4)	4,615 (69.8)	6,422 (83.1)	7,278 (91.6)	16.1	26.6	22.9	32.7
Germany	2,185 (35.7)	2,368 (35.8)	5,492 (71.0)	5,734 (72.2)	21.1	12.7	15.1	15.1
Other EU	3,294 (53.8)	4,145 (62.7)	6,932 (89.7)	7,081 (89.1)	44.4	39.4	40.0	33.2
Other OECD	2,617 (42.7)	3,189 (48.2)	4,643 (60.0)	4,381 (55.1)	9.6	10.1	10.7	7.4
CPLP	4,542 (74.1)	5,193 (78.6)	1,233 (15.9)	2,162 (27.2)	3.4	4.3	1.7	1.5
China	109 (1.8)	563 (8.5)	1,304 (16.9)	2,846 (35.8)	0.2	0.6	0.6	1.3
Rest of the World	2,699 (44.0)	3,616 (54.7)	2,998 (38.8)	3,644 (45.9)	5.3	6.3	9.0	8.8
Total	6,128	6,611	7,732	7,947	100.0	100.0	100.0	100.0

**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The left part of this table shows the number of products exported to (or imported from) each of the country groups defined in section 3.2. Shares in terms of the total number of exported or imported products are shown in parenthesis. The right part of the table shows the share of Portuguese exports (or imports) associated with each country group. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries.

Chart 1

## TRENDS IN THE NUMBER OF EXPORTED PRODUCTS, BY COUNTRY GROUP, 1995–2005

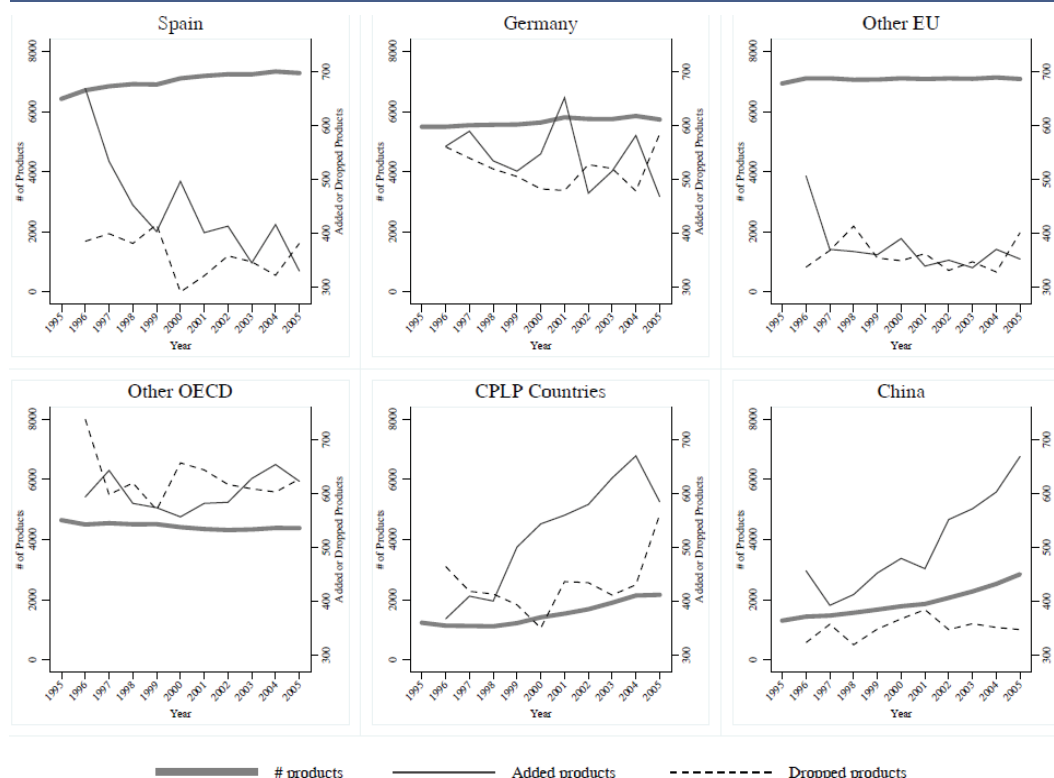


**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The thick line in each plot (measured on the left axis) represents the number of products exported by Portugal in each year of the 1995–2005 sample period. The thin solid line (measured on the right axis) represents the number of exported products added between  $t-1$  and  $t$ . The thin dashed line (measured on the right axis) represents the number of exported products dropped between  $t-1$  and  $t$ . Added and dropped products are defined in section 3.1. Country groups are defined in section 3.2. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries. The plot referring to the group "Rest of the World" has been omitted but is available upon request to the authors.

Chart 2

TRENDS IN THE NUMBER OF IMPORTED PRODUCTS, BY COUNTRY GROUP, 1995–2005



**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The thick line in each plot (measured on the left axis) represents the number of products imported by Portugal in each year of the 1995–2005 sample period. The thin solid line (measured on the right axis) represents the number of imported products added between  $t-1$  and  $t$ . The thin dashed line (measured on the right axis) represents the number of imported products dropped between  $t-1$  and  $t$ . Added and dropped products are defined in section 3.1. Country groups are defined in section 3.2. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries. The plot referring to the group “Rest of the World” has been omitted but is available upon request to the authors.

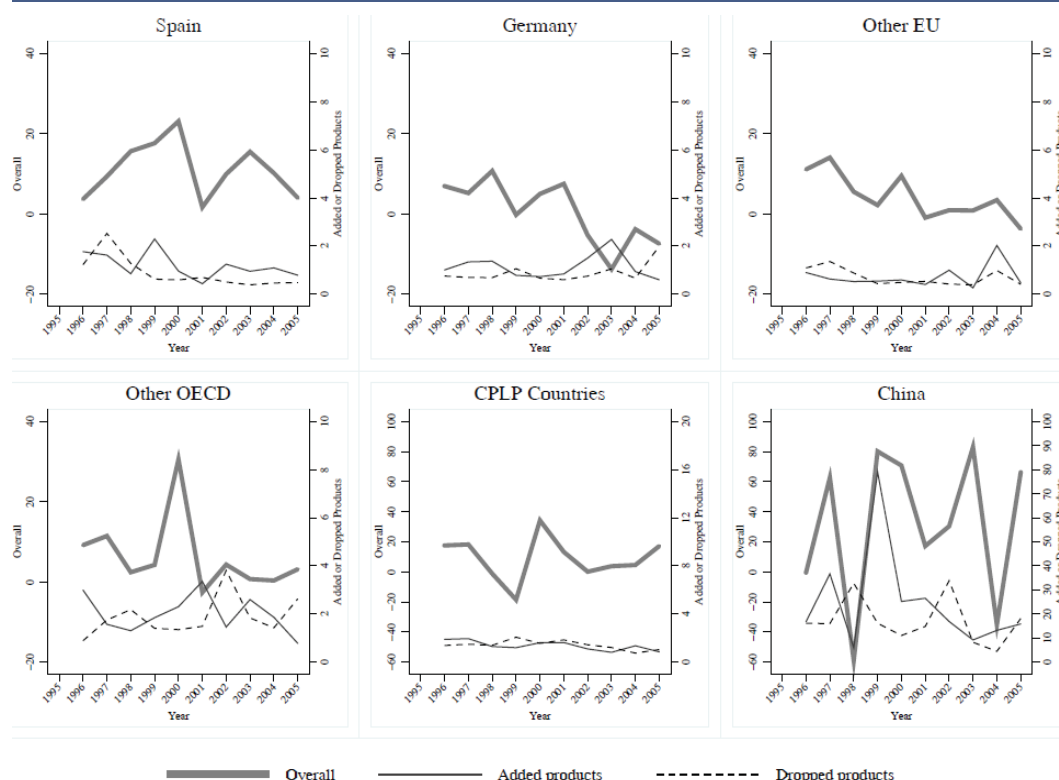
Spain is clearly Portugal's main foreign partner. In 2005, in terms of the extensive margin, it attracts about 70 percent of the products that belong to Portugal's export portfolio and provides Portugal with about 92 percent of its imported products. This translates into about 27 percent and 33 percent of Portugal's total exports and imports, a significant increase with respect to 1995 (Table 6). As chart 1 shows, the number of products exported to Spain (thick line), fairly flat up to the end of the 90s, picks up at the beginning of the 2000-decade, mainly as the result of a slowdown in the rate of dropped products (dashed line). In other words, while the number of products added to the Spanish market does not show any particular trend (thin solid line), those products that are already in the market show a higher degree of persistence.

Overall, more than three fourths of Portugal's exports and imports are associated to a European Union country, and European countries attract/provide the majority of exported/imported products. Worthwhile mentioning is the drop in exports to Germany, from 21.1 percent in 1995 to 12.7 percent in 2005 (Table 6 and Chart 3). Other OECD countries also attract or provide a large share of products and represent about 10 percent of exports and 7 percent of imports (in 2005). The CPLP countries are the destination of a large share of exported products, but are much less relevant in monetary terms, representing 4.3 percent of exports in 2005.

Particularly interesting is the case of China, which shows an impressive increase in the number of exported products (from 1.8 percent of Portugal's export product-portfolio in 1995 to 8.5 percent in

Chart 3

TRENDS IN THE GROWTH RATE OF EXPORTS, BY COUNTRY GROUP, 1995–2005



**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data) and authors' calculations.

**Notes:** The thick line in each plot (measured on the left axis) represents the yearly growth rate of exports between year  $t-1$  and year  $t$ . The thin solid line (measured on the right axis) represents the ratio between the exports of added products (in  $t$ ) and total exports in  $t-1$ . The thin dashed line (measured on the right axis) represents the ratio between the exports of dropped products (in  $t-1$ ) and total exports in  $t-1$ . Added and dropped products are defined in section 3. Country groups are defined in section 3.2. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries. The plot referring to the group "Rest of the World" has been omitted but is available upon request to the authors.

2005) and, especially, imported products (from 16.9 percent of Portugal's import product-portfolio to 35.8 percent) – see table 6. The latter is due to a dramatic increase in the number of added imported products, in spite of a fairly flat number of dropped products (Chart 2). This dynamics mimics the one occurring in the CPLP countries (except for the last year of the sample) and contrasts with the one of Spain, which shows a substantial decrease in the number of added imported products.

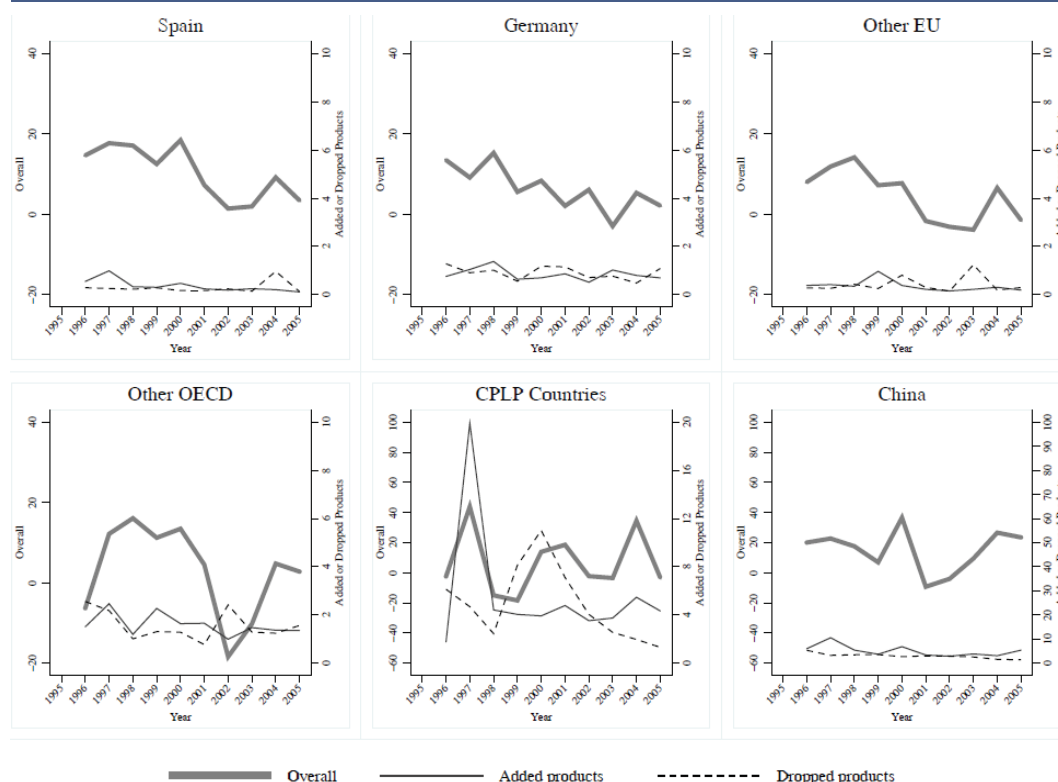
## 4. Conclusions

Controlling for changes in product codes over time is critical in the growing body of research examining firms' product-mix choices. In this article, we use Van Beveren, Bernard and Vandenbussche (2012)'s methodology, based on Pierce and Schott (2012), to study trends in Portuguese exports and imports for the 1995–2005 period. We find that, after applying the concordance, the extent to which product adding and dropping drive year-to-year changes in Portuguese exports and imports is greatly downsized. A time-homogenous product classification system is necessary to correctly understand the dynamics of exports and imports.

A merit of the algorithm proposed by Pierce and Schott (2012) is that it can be extended to incorporate future revisions of exported and imported products classification systems, and can be applied to create concordances of other product classification systems over time. For example, Van Beveren, Bernard

Chart 4

## TRENDS IN THE GROWTH RATE OF IMPORTS, BY COUNTRY GROUP, 1995–2005



**Sources:** Eurostat (Classification files from Ramon server), *INE* (Trade data), and authors' calculations.

**Notes:** The thick line in each plot (measured on the left axis) represents the yearly growth rate of imports between year  $t-1$  and year  $t$ . The thin solid line (measured on the right axis) represents the ratio between the imports of added products (in  $t$ ) and total imports in  $t-1$ . The thin dashed line (measured on the right axis) represents the ratio between the imports of dropped products (in  $t-1$ ) and total imports in  $t-1$ . Added and dropped products are defined in section 3. Country groups are defined in section 3.2. CPLP is the Portuguese acronym for the Community of Portuguese Language Countries. The plot referring to the group "Rest of the World" has been omitted but is available upon request to the authors.

and Vandenbussche (2012) create a concordance for the eight-digit Prodcom categories used to classify products in European domestic production data. These tools will surely prove to be important in understanding product-level choices both of Portuguese domestic producers and exporters.

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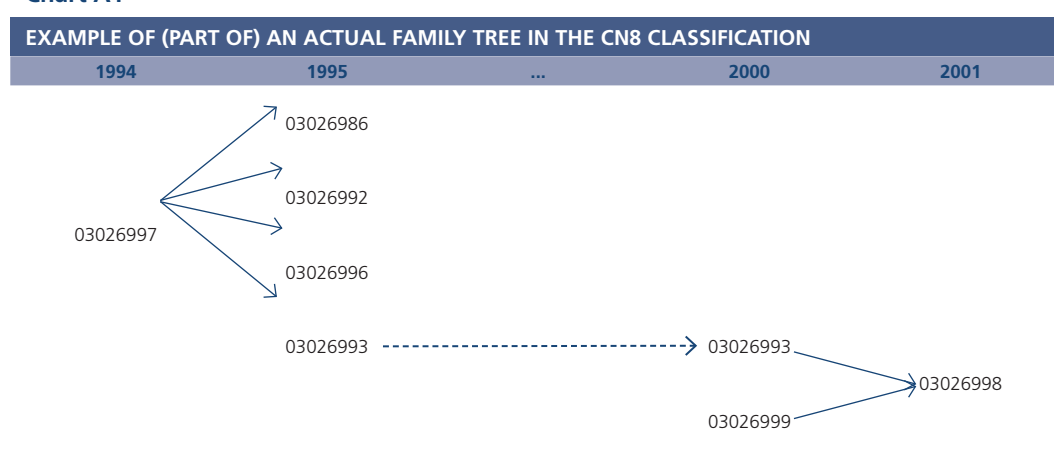


## Annex – Concordance Methodology

This section provides more details on the concordance methodology introduced in section 2.1.

Consider the following actual case (illustrated in Chart A1) of codes' mappings: in 1995, code 03026997 ("Saltwater fish – other") is replaced by 4 different codes, specifying distinct fish species, 03026986 ("...southern blue whiting..."), 03026992 ("...pink cusk-eel..."), 03026993 ("...Kathetostoma giganteum...") and 03026996 ("...Saltwater fish, edible, fresh or chilled, n.e.s. ..."); in 2001, one of these 1995-new codes, 03026993, was merged with the code 03026999 ("...Fresh or chilled saltwater fish, edible excl.... Kathetostoma giganteum..."), both replaced by the new code 03026998 ("...Fresh or chilled saltwater fish, edible excl...."); in this case, all the codes involved – 03026997, 03026986, 03026992, 03026993, 03026996, 03026999 and 03026998 – shall be considered as belonging to the same family tree and shall be assigned the same unique (synthetic) code.

Chart A1



**Source:** Eurostat (Classification files from Ramon server).

**Notes:** This chart shows an actual example of (part of) of a family tree in the CN8 classifications between 1994 and 2001.

The identification of family trees depends on the beginning and end year of the concordance. There are two basic types of family tree: growing trees and shrinking trees. Obviously, actual trees can be combinations of growing and shrinking sub-trees. The family tree shown in chart A1 spans the 1994–2001 period and consists of (at least) two sub-trees: a growing tree between 1994 and 1995, and a shrinking tree, between 2000 and 2001.

The algorithm we use for the concordance of CN codes between arbitrary beginning and end years accounts for both types of family trees, as well as combinations of the two types. Empirically, the family identification comprises two conceptual steps:

Identifying family “branches” within each correspondence file, by searching for simple (one-to-one) and complex (one-to-many, many-to-one, and many-to-many) mappings that have, at least, one common obsolete or new code. We assign the same synthetic code to all the codes belonging to a family branch.

Identifying chains linking family branches over time, by searching for new codes re-appearing as obsolete in a posterior year. We assign the minimum synthetic code (across family branches) to all codes belonging to branches of the same family tree.

Step 2 implies that the choice of the beginning and end year of the sample affects the identification of chains linking codes over time.

Table A1 provides summary statistics on the number of original CN8 codes re-classified and number of families they are grouped into after step 1 (within-year identification), for each year in our sample.



The largest number of obsolete codes occurs between 1995 and 1996 and between 2001 and 2002, when the HS6 classification changed.

Tables A2 and A3 provide summary statistics on the impact of the concordance after steps 1 (within-year grouping) and 2 (over-time chaining) are performed. Table A2 decomposes two sets of CN8 codes: (i) original CN8 codes are decomposed into those that are replaced and not replaced by synthetic codes during the concordance; (ii) surviving CN8 codes (after the concordance) are decomposed into those that are actual (original) and synthetic and, subsequently, each of these sub-sets is decomposed into codes that are common to 1995 and 2005 and those that are unique to each of those years. These decompositions are performed for exports and imports and for 1995 and 2005.

Note that the percentage of original codes involved in reclassifications, which was, on average 4% before the over-time chaining (Table A1), is now larger than 30% in 1995 and 2005, both for imported and exported product codes.

**Table A1**

NUMBER OF OBSOLETE AND NEW CODES (1995,2005)					
Effective year	Total # of CN8 codes	# of obsolete codes	# of new codes	# of families (including simple changes)	# of simple changes
1995	10,448	531	871	383	31
1996	10,495	1,257	1,304	792	435
1997	10,606	170	281	130	0
1998	10,587	334	315	175	0
1999	10,428	303	144	132	3
2000	10,314	223	109	96	0
2001	10,274	90	50	42	1
2002	10,400	847	973	504	311
2003	10,404	16	20	12	0
2004	10,174	503	273	211	7
2005	10,096	186	108	95	5
Média	10,384	405	404	234	72

**Sources:** Eurostat (Classification files from Ramon server), INE (Trade data), and authors' calculations.

Table A2

NUMBER OF ORIGINAL AND SYNTHETIC CODES, EXPORTS AND IMPORTS (1995,2005)								
	Exports				Imports			
	1995	%	2005	%	1995	%	2005	%
Original CN8 codes	7,090	100	7,492	100	9,210	100	9,181	100
Not-replaced	4,790	68	5,195	69	6,080	66	6,256	68
Replaced	2,300	32	2,297	31	3,130	34	2,925	32
Actual+synthetic codes after concordance	6,128	86	6,611	88	7,732	84	7,947	87
Actual codes	4,790	68	5,195	69	6,080	66	6,256	68
Common to both years	4,375	62	4,375	58	5,909	64	5,909	64
Appear in only one year	415	6	820	11	171	2	347	4
Synthetic codes	1,338	19	1,416	19	1,652	18	1,691	18
Common to both years	1,217	17	1,217	16	1,597	17	1,597	17
Appear in only one year	121	2	199	3	55	1	94	1

**Sources:** Eurostat (Classification files from Ramon server), INE (Trade data) and authors' calculations.

**Notes:** The top part of this table shows the number of original CN8 codes, associated with positive exports or imports in 1995 or 2005, and subdivides them into those replaced and not replaced by a synthetic code. The bottom part of the table shows the number of actual and synthetic CN8 codes after the concordance has been applied, and subdivides both actual and synthetic codes into those common to both 1995 and 2005 and those that appear in only one of these two years. Even columns display values as percent of the first row in the preceding column.

Table A3

EXPORTS AND IMPORTS ASSOCIATED TO ORIGINAL AND SYNTHETIC CODES (1995,2005)								
	Exports				Imports			
	1995	%	2005	%	1995	%	2005	%
Original CN8 codes	16,132	100	27,394	100	22,831	100	42,150	100
Not-replaced	11,761	73	18,278	67	14,446	63	26,762	63
Replaced	4,371	27	9,116	33	8,385	37	15,388	37
Actual+synthetic codes after concordance	16,132	100	27,394	100	22,831	100	42,150	100
Actual codes	11,761	73	18,278	67	14,446	63	26,762	63
Common to both years	11,611	72	17,973	66	14,285	63	25,930	62
Appear in only one year	150	1	305	1	161	1	832	2
Synthetic codes	4,371	27	9,116	33	8,385	37	15,388	37
Common to both years	4,345	27	9,026	33	8,349	37	15,216	36
Appear in only one year	26	0	90	0	36	0	172	0

**Sources:** Eurostat (Classification files from Ramon server), INE (Trade data) and authors' calculations.

**Notes:** The top part of this table shows the amount, in millions of euros, of exports and imports associated with original CN8 codes, and subdivides them into those associated with codes that were or were not replaced by a synthetic code. The bottom part of the table subdivides exports and imports into those associated with actual or synthetic codes that are common to both 1995 and 2005 or appear in only one of these two years. Even columns display values as percent of the first row in the preceding column.

# SHORT-TERM FORECASTING FOR THE PORTUGUESE ECONOMY: A METHODOLOGICAL OVERVIEW\*

*Paulo Soares Esteves\*\* | António Rua\*\*\**

## ABSTRACT

The aim of this article is to provide a stylised, concise description of the methodology underlying the short-term forecasting exercise for the economic activity regularly conducted at Banco de Portugal. As in the case of other central banks, it is useful to share the experience acquired in the development of tools aimed at obtaining short-term forecasts for the Portuguese economy. The rationale underlying the methodology is discussed intuitively and its corresponding presentation should be considered merely illustrative due to the dynamics of the process. This approach may potentially change, due to the continuous search for additional indicators and use of alternative econometric models. The article also presents an overview of analogous experiences at other central banks, namely within the Eurosystem.

## 1. Introduction

A timely evaluation of the current economic situation as well as a correct perception of its near term evolution are key inputs for economic policymaking, as the actions to be taken may be crucially dependent upon the quality of such an assessment.

In this context, a set of tools has been developed at Banco de Portugal to predict economic behaviour in the current quarter as well as in the several of the immediately subsequent quarters (commonly referred to in the literature as nowcasting and short-term forecasting, respectively). This article summarises the current approach. It should be noted that the current procedure results from a process evolving over time and influenced by the developments in the national statistics system. Concerning the latter point, reference should be made to the improvements made by the National Statistics Institute (INE) in terms of its compilation and release of the national accounts, both annual and quarterly, with a more regular compilation and earlier release dates. In this respect, it should be noted that there is a current time lag of 70 days in the release of the Quarterly National Accounts as opposed to 120 days up to the end of 2002.<sup>1</sup> Based on the results of Cardoso and Rua (2011) and José (2004), real-time reliability has also improved.

The methodological developments concerning short-term forecasting were also influenced by more demanding requirements associated with Portuguese membership of the euro area. After a long period in which estimates for the current and previous years were only published annually, Banco de Portugal started to publish regular projections for the Portuguese economy in its December 2000 Economic Bulletin,

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<sup>1</sup> In the first quarter of 2007, INE started to release a flash estimate for the GDP growth rate 45 days after the reference period.

one month after the European Central Bank began to publish projections for the euro area based on the forecasts reported by the central banks belonging to the Eurosystem. In this context, there was a more pressing need for quarterly macroeconomic scenarios. Despite the volatility of the quarterly figures, this development facilitates the assimilation of the effects of the intra-annual profile of the previous year on the annual projections as well as reflecting the most recent economic data available.<sup>2</sup>

The aim of this article is to describe the general guidelines underlying the current approach to conducting short-term macroeconomic forecasts. A concise description of the methodology currently in place is therefore provided containing information on its organization from a conceptual point of view while illustrating the different stages involved. This description should be considered merely illustrative due to the evolving nature of the process.

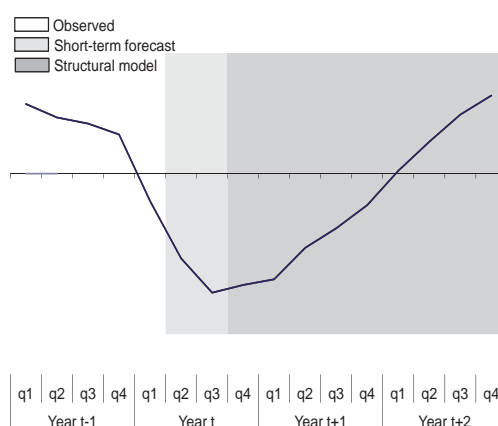
The article is organized as follows. In section 2, the main features of the approach to short-term forecasting for the Portuguese economy are discussed. In section 3, the practice at other central banks is reviewed. The conclusion is given in section 4.

## 2. Methodological overview

The forecast horizon of the short-term forecasting exercise is updated quarterly, with the first forecast for each quarter being conducted two quarters ahead of its publication by *INE*. For example, in June of a given year, one takes on board *INE*'s latest release of the Quarterly National Accounts for the period up to the first quarter of the said year, while continuing to forecast the second quarter (which started being forecasted in March) and forecasts for the first time the third quarter. The projections for the following quarters are obtained from a structural macroeconometric model. It should be noted that models of the latter type do not aim to capture very short-run behaviour and do not take into account the short-term economic indicators that become available. This process is illustrated in Chart 1.

Chart 1

### FORECASTING EXERCISE



Source: Authors' calculations.

<sup>2</sup> In this context, Banco de Portugal, in 2004, started to regularly disclose a dataset covering the period since 1977 (see Castro and Esteves (2004)) while Amador and Dias (2004) provided the first formal contribution to the development of a procedure for the short-term forecasting of the main variables of the Quarterly National Accounts.

## 2.1. Main features

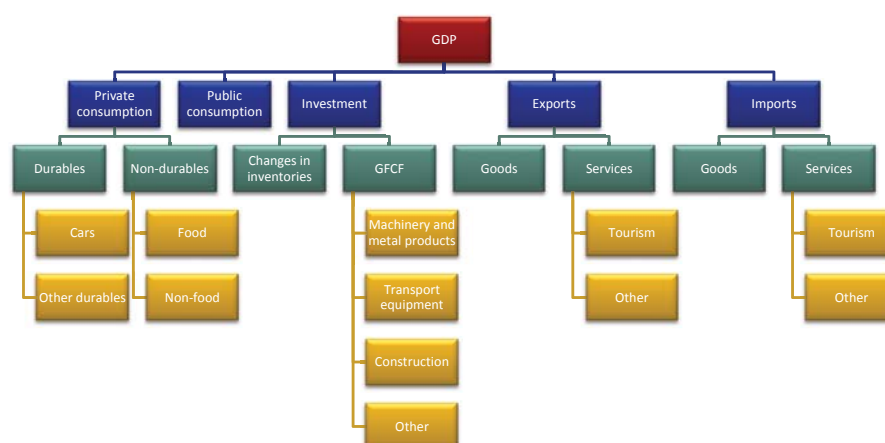
The short-term forecasting procedure is characterized by several special features. Firstly, GDP forecasting follows a bottom-up approach. *i.e.*, a forecast for each of the demand side components is obtained, which after taking the national accounts identities into account gives an implicit GDP forecast. This is the standard practice among institutions that report short-term forecasts, whose reasons for their choice are quite easy to understand.<sup>3</sup> The elaboration and presentation of a macroeconomic scenario makes it necessary to justify the GDP growth forecast. The projection of the various GDP components therefore facilitates the interpretation of the resulting GDP forecast and, accordingly, disciplines the construction of macroeconomic scenarios. In addition, the use of a bottom-up approach also facilitates the inclusion of judgment in the forecasting exercise.

The level of disaggregation considered in the bottom-up approach is conditional on the quality and availability of the data as well as on the ability to forecast the different variables. A stylised presentation of the disaggregation level considered at Banco de Portugal is given in Chart 2. Reference should be made to the use of certain specifications for forecasting purposes in the case of several variables. In addition to making it possible to forecast such variables, the use of such rules can also affect the correlation structure of the forecast errors between the different variables which can lead to an improvement of the forecasting performance of the bottom-up approach. For example, import forecasts are usually based on the behaviour of global demand weighted by the imported content while the change in inventories is modelled through a positive relationship with imports. In both cases, such *a priori* rules result in an increase of the correlation between the forecast errors of the several demand side components and imports, making it possible to reduce GDP forecast errors.

Concerning data transformation issues, the focus is, in general, on forecasting the year-on-year growth rate. This choice can be motivated by several reasons: i) the lack of chained external trade deflators indices, which makes it harder to interpret the quarter-on-quarter growth rates of the deflators and corresponding real changes; ii) the high volatility present in the quarter-on-quarter growth rates; iii) the strong seasonal pattern in some economic indicators; iv) the higher resemblance between variables measured in year-on-year terms and the evolution of some qualitative indicators.

Chart 2

### BOTTOM-UP APPROACH



Source: Authors' calculations.

- <sup>3</sup> See, for example, Esteves (2011) for a discussion regarding the issue of a direct forecast of GDP or resorting to a bottom-up approach in which a GDP forecast is obtained by aggregation of the projections to the corresponding demand side components.

Another feature of short-term forecasting is its eclectic nature to the extent that it includes both quantitative and qualitative available data, along with econometric models and judgment whenever required.

Regarding judgment, Pagan and Robertson (2002) are clear about its role on forecasting: “One thing that is clear, however, is that monetary policy institutions rarely, if ever, rely solely on mechanical model-based forecasts. If the science of forecasting is the model, then the art of forecasting is the judgment that is applied by the individuals involved”.

Finally, in terms of econometric modelling, it should be acknowledged that there is a wide range of possible models, including a simple recursive historical average, univariate autoregressive models, vector autoregressive models, bridge models, factor models that take on board many time series, etc. As in the case of many other central banks and international institutions, bridge models have been the preferred modelling tool.

## 2.2. Forecasting with bridge models

As already mentioned, the current approach draws heavily on a set of bridge models that use comprehensive economic data available for Portugal to forecast the behaviour of demand side components. The fact that such types of models generally compare relatively well with other alternative short-term forecasting models in conjunction with their simplicity and tractability, has made them very popular among central banks and international institutions. Applications of bridge models can be found, for example, in Ingenito and Trehan (1996) for the United States, Zheng and Rossiter (2006) for Canada, Parigi and Schlitzer (1995) and Golinelli and Parigi (2005) for Italy, Barhoumi *et al.* (2011) for France, Grasmann and Keereman (2001), Rünstler and Sédillot (2003) and Diron (2006) for the euro area, Baffigi *et al.* (2004) for Germany, France, Italy and the euro area and Sédillot and Pain (2003) for several OECD countries.

A stylised presentation of the underlying idea is given in Chart 3, in which two monthly economic indicators are used to forecast a quarterly macroeconomic variable. As mentioned above, the idea is to exploit the informational content of the various economic indicators that are regularly released in order to obtain short-term forecasts for the main macroeconomic variables. Although conceptually straightforward, the practical implementation of this procedure involves the need to address several problems. Firstly, the economic indicators to be used for forecasting each variable must be selected. Secondly, the use of such information in real-time generally also involves the need to forecast the short-run evolution of the referred to economic indicators. In this respect, reference should be made to the fact that the economic indicators are usually available on a monthly basis whereas the variables to be forecasted are quarterly. This means that establishing a macroeconomic projection based on forecasting economic indicators enables the transparency of the exercise, by facilitating the monitoring thereof over time with the inclusion of additional monthly information. Thirdly, a bridge between the referred to economic indicators and the variable to be forecasted must be established. In particular, this is done by resorting to bridge models.

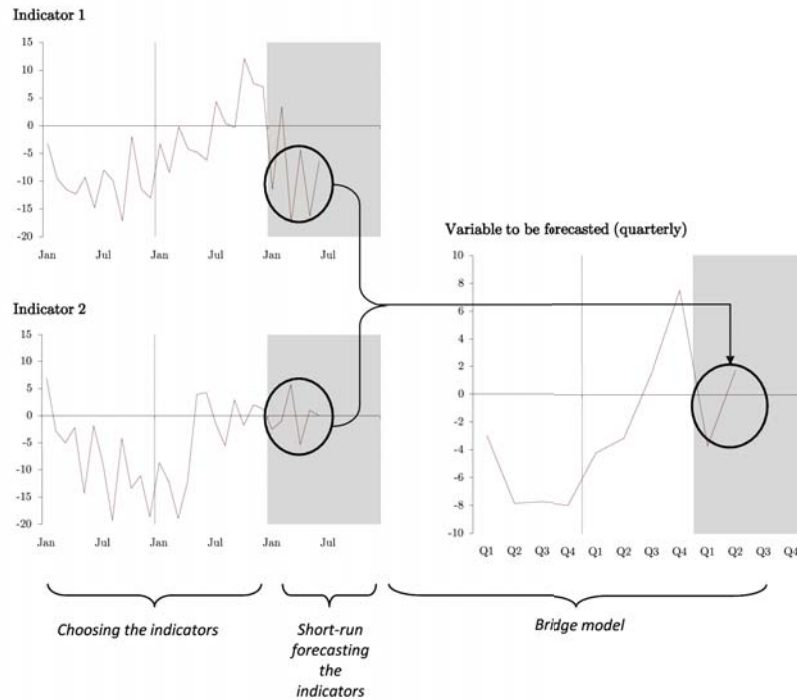
### 2.2.1. Choosing the economic indicators

The following should be taken into account when selecting the economic indicators. On the one hand, the indicators should be related, in economic terms, with the macroeconomic variable of interest. On the other hand, there should be a significant in-sample statistical relationship between the indicators and the variable to be forecasted.

Among the selected indicators it is important to distinguish two types of indicators. The first includes what are referred to as direct indicators, i.e. indicators that can be used directly (without a bridge) to

Chart 3

FORECASTING VIA BRIDGE MODEL



Source: Authors' calculations.

capture the evolution of the variable of interest. The two main examples refer to vehicle sales<sup>4</sup> and nominal external trade figures, which are available a few days and 45 days after the end of the reference month, respectively.

The second types of indicators include indirect indicators, *i.e.* indicators that are related with the variable of interest but cannot be used directly to assess its evolution. Such indicators can be broken down into quantitative (hard data) and qualitative (soft data) indicators.

Within the innumerable quantitative indicators the following should be highlighted. In the case of private consumption, reference should be made to the real retail trade turnover index and its disaggregation, usually published by INE around a month after the reference period, as well as data referring to Automated Teller Machines and Point of Sale (ATM/POS) terminals provided by SIBS and disclosed by Banco de Portugal a few days after the end of the month.<sup>5</sup> Other examples include, for instance, cement sales for the domestic market to track construction GFCF and equipment imports to assess machinery and equipment GFCF.

<sup>4</sup> However, in the case of vehicle sales, the quality effect is also taken into account. The quality effect endeavours to adjust the volume of vehicle sales based on the respective segments. A nil quality effect translates into a uniform distribution of vehicle sales over the different segments whereas a positive (negative) quality effect implies a bias in this distribution towards higher sales of vehicles in the higher (lower) range segments.

<sup>5</sup> Regarding the usefulness of ATM/POS data to estimate the behaviour of private consumption see Banco de Portugal (2011a).

In addition to quantitative indicators, the use of qualitative data is also quite important.<sup>6</sup> This results from the fact that consumers and business surveys have several important properties such as: i) availability, both in terms of time span as well as in terms of sectoral coverage; ii) it includes questions about expectations; iii) monthly frequency; iv) timeliness since it is released immediately after the end of the reference period; v) real-time reliability as there are usually no revisions to the series.

Regarding the use of this qualitative information, special reference should be made to the importance of confidence indicators due to their ability to track economic fluctuations, which also have some leading properties vis-à-vis some demand side components. Banco de Portugal (2009) illustrates the usefulness of the consumer confidence indicator to anticipate private consumption developments. Maria and Serra (2008) analyze the relationship between qualitative indicators and business investment while Cardoso and Duarte (2006) use qualitative data to forecast merchandise exports.

Naturally, along with the continuous development of the national statistics framework, there is a permanent search for and re-evaluation of potential indicators for forecasting purposes.

### 2.2.2. Short-run forecasting the indicators

Before establishing a bridge between the selected indicators and the variable to be forecasted, it is crucial to predict the near term developments of these indicators to enable the real-time forecasting exercise to be performed.

A SARIMA (Seasonal AutoRegressive Integrated Moving Average) model, enabling the capture of seasonal and non-seasonal short-run dynamics is used for most indicators

$$\phi(L)\phi(L^s)(\Delta^d x_t - \alpha - \beta_1 D_1 - \dots - \beta_{11} D_{11}) = \theta(L)\delta(L^s)\varepsilon_t$$

in which  $\alpha$  denotes the constant term,  $d$  corresponds to the differencing order necessary to make  $x$  stationary,  $D_i$  is a seasonal dummy ( $i = 1, \dots, 11$ ),  $\beta_i$  is the corresponding coefficient,  $\varepsilon_t$  is a white noise and the polynomials in the lag operator ( $L$ ) are defined as usual ( $\phi(L)$  – autoregressive polynomial;  $\phi(L^s)$  – seasonal autoregressive polynomial;  $\theta(L)$  – moving average polynomial;  $\delta(L^s)$  – seasonal moving average polynomial). The identification of the model is based on the well known Box-Jenkins approach and the corresponding estimation uses non-linear least squares. Although multivariate models may be considered, within the bridge models literature, it is usual for univariate models to be considered for predicting the short-run developments of the indicators in which each variable is forecasted on the exclusive basis of its past regularities (see, for example, Rünstler *et al* (2009)).<sup>7</sup>

In the case of some economic indicators, the short-run evolution is predicted by using specific models developed in several studies. For example, the behaviour of nominal goods exports is based on several qualitative indicators (see Cardoso and Duarte (2006)). It is occasionally necessary to apply a rule-of-thumb, such as the carry-over assumption (*i.e.* that the variable maintains its last observed value). This is done essentially for variables with a high volatility and for which it was not possible to find any model with a satisfactory predictive ability.

The use of the above mentioned models is also complemented by information provided by large firms, namely, related to the auto, aviation and energy sectors. This information is also reflected in the external trade data due to its importance.

<sup>6</sup> As an example of how quantitative and qualitative data complement each other, reference may be made to the monthly coincident indicators for economic activity and private consumption regularly released by Banco de Portugal (see Rua (2004, 2005)).

<sup>7</sup> A recent application of this approach to predict passenger vehicle sales is presented by Banco de Portugal (2011b).



Finally, the short-run forecasts can be influenced by judgment, especially, when there are reasons to believe that there might be special factors at play which are not captured by the models. In particular, the judgment can reflect developments which models cannot forecast (resulting from information provided by some economic agents) or simply the expertise of the individuals involved regarding the latest forecast errors.

### 2.2.3. The bridge between the economic indicators and the variable of interest

When the economic indicator is not a direct one, the relationship between the selected indicators and the variable to be forecasted must be estimated. In particular, it is considered a bridge model

$$y_t = \alpha + \sum_{j=1}^J \theta_j y_{t-j} + \sum_{m=1}^M \sum_{k=0}^K \beta_{m,k} x_{m,t-k} + \varepsilon_t$$

in which  $y_t$  denotes the variable to be forecasted and  $x_m$  the  $m$  economic indicator. The forecast, therefore, depends on the past history of the dependent variable – autogressive component – and on the current and past values of the selected indicators.<sup>8</sup> In particular, several alternative specifications may be considered, including a single economic indicator or several at the same time. Instead of using only the best forecasting model, Bates and Granger (1969) suggest that a combination of forecasts should be considered. Empirical results in the related literature show that combining the forecasts of different models can be very useful, in particular, in a context of parameter instability or model uncertainty (see, for example, Aiofli *et al.* (2010)).

A possible way of combining the forecasts is described in Diebold (1988). It basically consists of weighting the different forecasts based on the past performance of each model and the correlation structure among the corresponding forecast errors. In particular, the forecast for a given variable is defined as a weighted average of the forecasts coming from  $N$  estimated models,

$$y^P = \sum_{n=1}^N \omega_n^* y_n^P$$

in which  $y_n^P$  is the predicted value given by model  $n$  ( $n=1, \dots, N$ ) and the optimal weights are given by

$$W_{(N \times 1)}^* = \Omega^{-1} i / (i' \Omega^{-1} i)$$

in which  $\Omega$  is the variance-covariance matrix between the  $N$  one step ahead forecast errors and  $i$  is a unit vector of dimension  $N$ . Granger and Ramanathan (1984) have shown that these weights can be obtained through the regression of the observed values for  $y$  in the forecasts provided by the different models, without constant term and assuming that the sum of the coefficients is one.

In practice, the forecast obtained from this aggregation procedure may be compared with the one resulting from a simple average (*i.e.* equal weights for the different forecasts). For example, Smith and Wallis

<sup>8</sup> An alternative forecasting model, which has become increasingly popular in the literature in the last few years, is the factor model. This model assumes that the behaviour of each variable can be decomposed in two parts: the common component, which can be captured by a limited number of factors, and an idiosyncratic component which reflects the specific dynamics of each variable. An attractive feature of the factor models is that it allows to take on board many time series simultaneously. However, one of the practical problems is the fact that considering more series does not result necessarily in better forecasting performance (see, for example, Boivin and Ng (2006)). In this context, several alternatives have been proposed in the literature to address this issue (see, for example, Dias *et al.* (2010)).

(2009) have shown that considering different weights may not prove to be better, in terms of forecasting performance, than using a simple average due to the estimation error in finite samples.

To provide a clearer illustration of the above discussion, the application thereof is considered to the case of non-durables, non-food private consumption. This component accounts for around 2/3 of Portuguese private consumption.

To forecast this variable, several possible economic indicators are considered, namely: i) the real retail trade turnover index for non-durables, non-food goods; ii) the consumer confidence indicator; iii) ATM/POS data. A model including each variable and a model with all indicators simultaneously are considered. The corresponding estimated models for the last decade are as follows:

$$i) \quad \hat{y}_t = 1.117 + 0.628 y_{t-1} - 0.301 y_{t-4} + 0.245 x_{1,t}$$

(0.227) (0.089) (0.075) (0.042)

$$ii) \quad \hat{y}_t = 5.711 + 0.463 y_{t-1} - 0.260 y_{t-4} + 0.085 x_{2,t} + 0.056 x_{2,t-2}$$

(1.089) (0.123) (0.075) (0.016) (0.027)

$$iii) \quad \hat{y}_t = -0.144 + 0.838 y_{t-1} - 0.198 y_{t-4} + 0.231 x_{3,t} - 0.161 x_{3,t-1}$$

(0.281) (0.100) (0.097) (0.059) (0.055)

$$iv) \quad \hat{y}_t = 2.752 + 0.631 y_{t-1} - 0.208 y_{t-4} + 0.108 x_{1,t} + 0.055 x_{2,t} + 0.074 (x_{3,t} - x_{3,t-1})$$

(0.762) (0.090) (0.080) (0.064) (0.023) (0.049)

in which  $y$  denotes the year-on-year (y-o-y) real growth rate of non-durables, non-food private consumption;  $x_1$  refers to the y-o-y growth rate of the retail trade turnover index for non-durables, non-food goods;  $x_2$  represents the consumer confidence indicator and  $x_3$  denotes the y-o-y ATM/POS data growth rate indicator. The figures set out in brackets are the standard errors of the estimated coefficients and all the models have been checked by a battery of tests including model specification, autocorrelation, heteroscedasticity and residuals normality.

The following should be noted regarding the selected specifications. The term corresponding to the  $y$  variable lagged one period, suggests a high persistence in terms of behaviour of the dependent variable. This is expected as the variable is considered in y-o-y growth rates. The same applies to the  $y$  variable lagged four periods. Its statistical significance reflects the importance of base effects when y-o-y growth rates are considered.

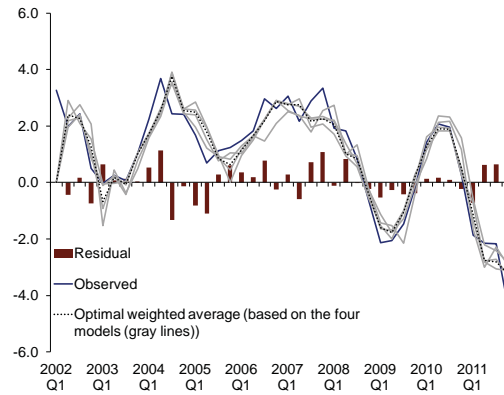
Reference should be made to the following in terms of economic indicators: the retail trade index for non-durables, non-food goods appears contemporaneously as expected; the consumer confidence indicator has leading properties (in particular, in model ii); as regards ATM/POS data, both the contemporaneous and the one period lags are significant although the fact that they have opposite signs suggests that such a nominal indicator is more useful in terms of acceleration/deceleration, with the hypothesis of being symmetric not being rejected in model iv).

Chart 4 presents the fit of each individual model throughout the sample period as well as the one resulting from optimal weighting. In particular, the optimal weights are given by: i) 1%; ii) 30%, iii) 5%, iv) 64%.

Chart 5 illustrates the above described procedure for the first out-of-sample period, *i.e.*, the first quarter of 2012. It presents two possible ways of obtaining a forecast. The first forecast (P1) results from the direct application of the above procedure in which the forecast for the year-on-year real growth rate for non-durables, non-food private consumption corresponds to the weighted average of the forecasts of the various estimated models, using the weights derived above. The second forecast (P2) corresponds to the prediction of the change in the year-on-year real growth rate, *i.e.* acceleration/deceleration. In

Chart 4

NON-DURABLES NON-FOOD PRIVATE CONSUMPTION | ESTIMATED MODELS AND OPTIMAL WEIGHTED AVERAGE



Source: Authors' calculations.

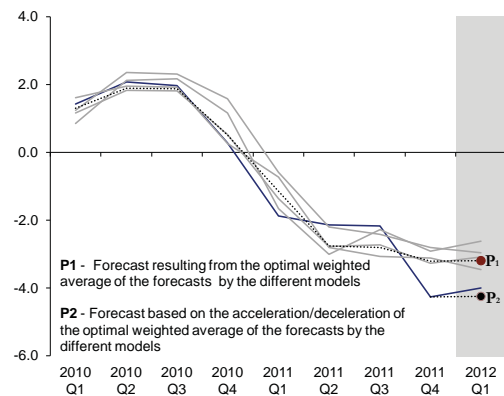
this case, it is implicitly assumed that the residual will have the same value that was observed in the last period (referred to as the constant adjustment). This way of proceeding can be quite relevant when a substantial difference between the last observation and the forecast is noted, as in the case of the last quarter of 2011 (see Chart 4).

In general, through the residual analysis many other possible ways could be envisaged as, for example, using the average of the more recent residuals. Such a choice will eventually be up to the expert and on the interpretation of the nature of the observed residuals in the more recent period. When conducting the forecasting exercise, this is the step that usually involves a greater input from the expert.

### 3. Short-term forecasting at other central banks

Chart 5

NON-DURABLES NON-FOOD PRIVATE CONSUMPTION | ALTERNATIVE FORECASTS



Source: Authors' calculations.

As in the case of Portugal, in most central banks, the type of models used for forecasting is conditional on the forecast horizon. In particular, there is a clear distinction between short-term and medium/long term forecasting (see, for example, Gerdrup and Nicolaisen (2011) for a detailed description of how the forecasting exercise is organized in Norges Bank, Bundesbank (2009) for the German case while Pagan and Robertson (2002) portray the process in several central banks including the U.S. Federal Reserve, Bank of Canada, Reserve Bank of New Zealand, Bank of England and Reserve Bank of Australia). In general, the forecast horizon includes the first two quarters in the former case, as the starting point for the medium/long term forecasting in which a completely different approach is used. Such a distinction reflects, *inter alia*, the fact that when conducting the short-term forecasting exercise, there is a special interest in including high frequency, namely monthly, data whereas in a structural model of simultaneous equations only quarterly or annual data are usually considered. The fact that the release of the information in real-time also occurs with different time lags, constitutes *per se* an additional problem in the short-run evaluation of economic activity. The econometric tools used should therefore differ depending on the forecast horizon in order to address the corresponding specific issues.

Typically, for the reasons referred to above, the short-term forecasting exercise at central banks follows a bottom-up approach.<sup>9</sup> For example, at the Bundesbank a bottom-up approach is used for both the demand and supply sides despite the fact that, in the case of the demand side, the level of disaggregation considered is lower than at Banco de Portugal. Although it is more usual to follow a demand side approach, at some central banks, namely at the Bundesbank and Bank of England, the supply side is also considered. In the case of Germany, this is due to the importance of the industrial sector on the behaviour of economic activity. As a result, the industrial production index is followed with particular attention when assessing the current economic situation. In turn, in the United Kingdom, there are more economic indicators on the supply side and they are also more timely released. This is reflected in the fact that the UK Office for National Statistics compiles its first estimate for GDP based on supply side statistics.

As mentioned above, concerning the econometric models that can be used for short-term forecasting, there are many potential alternatives (see, for instance, Rünstler *et al.* (2009) for a discussion on several econometric models for nowcasting and short-term forecasting and their corresponding application to several European countries). However, despite the innumerable alternatives, the use of bridge models is a standard practice within the Eurosystem. Nevertheless, it is worth mentioning that an increasing number of central banks has been implementing factor models benefiting from the developments in this strand of literature. However, the practical use of such models raises some issues in terms of monitoring and the inclusion of judgment is less straightforward due to the wide range of data involved.

Concerning the information to be assimilated, it is standard practice to use both quantitative and qualitative data. In contrast with, for example, the United States, the information conveyed by consumer and business surveys constitute an important part of the data used for forecasting purposes in European countries (in some cases, this can be as or even more important than quantitative data). Among the advantages discussed previously, reference should once more, be made to the ability of qualitative data to anticipate the evolution of economic activity.

Although reflecting the idiosyncrasies of each country, another common feature is the continuous search for additional indicators for the real-time tracking of the behaviour of the main macroeconomic variables. For example, at the Danmarks National Bank credit card payments are used to anticipate retail sales in Denmark (Carlsen and Storgaard (2010)); Fenz and Schneider (2009) suggest using truck mileage as a leading indicator of Austrian exports; Huurman *et al.* (2009) suggest using weather forecasts to improve the forecasts of electricity prices in the Nordic countries.

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<sup>9</sup> In some cases, the bottom-up approach is complemented by direct forecasts for GDP, namely through the use of factor models. For applications of this type of model developed at Banco de Portugal see, for example, Dias *et al.* (2010) and Rua (2011).

## 4. Conclusions

A timely evaluation of the current economic situation as well as a correct perception of the near term developments is crucial for several economic agents. Without knowing the starting point it is harder to know where we are heading. In such a context, short-term forecasting is particularly relevant.

As in the case of other central banks, this article aims to describe the methodology currently in use for the short-term forecasting of economic activity in Portugal. It should be remembered that the current approach has evolved over time and has been influenced by the developments observed on the national statistical level and stimulated by the more demanding requirements resulting from Portuguese participation in the regular Eurosystem forecasting exercises.

Naturally, the synopsis contained in this article as well as the results herein presented should be considered illustrative. The short-term forecasting approach is always evolving through the search for additional economic indicators and the development of alternative forecasting models.

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