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PROJECTIONS FOR THE PORTUGUESE ECONOMY: 2014-2016

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Projections for the Portuguese economy: 2014-2016

1. Introduction

Projections for the Portuguese economy in 2014-2016 reflect an ongoing process of gradual adjustment of macroeconomic imbalances, amid moderate growth of activity and of the price level, also characterised by the maintenance of the ability to reduce external indebtedness.

Following a virtual stabilisation of the level of activity in the first three quarters of 2014, current projections point to an ongoing path of gradual recovery of activity that had started in 2013. This should translate into an annual average rate of change of Gross Domestic Product (GDP) of 0.9 per cent in 2014 and 1.5 per cent and 1.6 per cent in 2015 and 2016 respectively, implying average growth in this period slightly above that projected for the euro area. These projections point to the maintenance of robust export growth and an acceleration in Gross Fixed Capital Formation (GFCF) in 2015-2016, in tandem with some deceleration in private consumption. Developments in domestic demand are likely to continue to be conditioned by a still high level of private sector indebtedness and the fiscal consolidation process. The buoyancy of exports, amid improved terms of trade, is expected to benefit the maintenance of current plus capital account surpluses over the projection horizon, allowing for an improvement in the international investment position.

	Weights	Dec	EB cember 20	EB EB hber 2014 October 2014		EB June 2014		
	2015	2014 ^(p)	2015 ^(p)	2016 ^(p)	2014 ^(p)	2014 ^(p)	2015 ^(p)	2016 ^(p)
Gross Domestic Product	100.0	0.9	1.5	1.6	0.9	1.1	1.5	1.7
Private Consumption	65.7	2.2	2.1	1.3	1.9	1.4	1.5	1.5
Public Consumption	18.3	-0.5	-0.5	0.5	-0.7	-0.2	-1.4	0.2
Gross Fixed Capital Formation	16.3	2.2	4.2	3.5	1.6	0.8	3.7	3.9
Domestic Demand	100.7	2.3	1.0	1.5	1.9	1.4	1.0	1.6
Exports	37.3	2.6	4.2	5.0	3.7	3.8	6.1	5.6
Imports	38.0	6.3	3.1	4.7	6.4	4.6	4.8	5.5
Contribution to GDP growth (in p.p.):								
Domestic Demand		2.3	1.1	1.5	1.9	1.4	1.0	1.6
Exports		1.0	1.7	2.1	1.5	1.5	2.5	2.4
Imports		-2.5	-1.3	-2.0	-2.5	-1.8	-2.0	-2.3
Current plus Capital Account (% of GDP)		2.6	2.8	2.9	2.2	2.8	4.0	4.3
Trade Balance (% of GDP)		1.6	2.5	2.6	1.6	2.0	3.0	3.3
Harmonized Index of Consumer Prices		-0.1	0.7	1.0	0.0	0.2	1.0	1.1

Table 1.1 • Projections of Banco de Portugal: 2014-2016 | Annual rate of change, per cent

Source: Banco de Portugal.

Note: (p) - projected. For each aggregate, this table shows the projection corresponding to the most likely value, conditional on the set of assumptions considered.

Inflation is expected to record low levels throughout the projection horizon, given that the downward pressure on prices at domestic and external levels is expected to continue, notably with import prices (including and excluding energy) recording negative average changes in the 2014-2016 period.

There are small downward risks for GDP growth for 2015 and 2016, given the possibility of a less favourable external demand and a more significant reduction of public consumption, partly offset by upward risks associated with the impact of structural reforms. In this context, risks for inflation are considered to be marginally downward.

2. Recent information

The projections now released correspond to those included in the Eurosystem's exercise published by the European Central Bank (ECB) on 4 December. Hence, the cut-off date for this Bulletin was 19 November 2014 (Box 1 "Technical assumptions").

In the first half of 2014 economic activity grew moderately year on year (0.9 per cent). This reflected a gross contribution of 2.6 percentage points (p.p.) from domestic demand and of 1.1 p.p. from exports, with imports making a negative 2.7 p.p. contribution to GDP. Net of imports, GDP growth is estimated to be associated with a 0.5 p.p. contribution from exports and 0.4 p.p. from domestic demand. The demand aggregates net of imports are obtained by subtracting an estimate of the imports needed to meet each component.¹ In the same period, the economic activity level virtually stabilised in comparison with the previous half of the year.

Economic activity grew in the third quarter compared with both the previous quarter and the same quarter a year earlier

According to the first estimate released by Statistics Portugal on 14 November 2014, GDP grew by 1.0 per cent year on year in the third quarter of 2014, similarly to the two previous quarters (1.0 and 0.9 per cent in the first and second quarters respectively). Compared with the previous quarter, the level of economic activity rose slightly (0.2 per cent) in the third quarter of 2014, following -0.4 and 0.3 per cent changes in the first and second quarters respectively (Chart 2.1).

Chart 2.1 • Gross domestic product | Real rate of change, in percentage

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The breakdown of GDP developments into the main expenditure aggregates is not included in the official release of the first estimate of GDP, having been published by Statistics Portugal in late November. Therefore, it was not incorporated into the projections.² Based on short-term indicators available up to 19 November and on the qualitative assessment in the release of the first estimate by Statistics Portugal, the evolution of these aggregates in the third quarter underlying the current projections is presented below.

The year-on-year evolution of GDP had an underlying increase in private consumption, which accelerated from the previous quarter, reflecting developments both in the consumption of non-durable goods and services and the consumption of durables. With regard to consumption of non-durable goods and services, it is worth mentioning the developments in the deflated turnover index in retail trade of non-food non-durables, which accelerated year on year over the first three quarters of 2014 (1.3, 1.6 and 3.5 per cent from the first to the third quarters respectively).

As regards durables, passenger car sales grew by 29.8 per cent in the third quarter, after 35.5 per

cent in the second quarter. In 2014 the monthly average number of cars sold amounted to around 12,000, clearly below the monthly average number of vehicles sold in the ten-year period between 2001 and 2010 (around 17,000 cars). In turn, the deflated turnover index in the retail trade of durables grew by 2.4 per cent in the third quarter of 2014 (-0.1 and 0.5 per cent in the first and second quarters respectively).

In addition, there was an ongoing recovery of consumer confidence throughout 2014, remaining consistently above the average of the past ten years (Chart 2.2). This favourable evolution was also observed in most confidence indicators, translating into an increase in the economic sentiment indicator. In the labour market there were also some signs of improvement in employment (Box 2 "Recent employment developments in the Portuguese economy").

GFCF year-on-year growth was generally in line with that seen in the previous quarter. Activity in construction continued to decline, in line with data on cement sales for the Portuguese market, which dropped by 8.9 per cent in the third quarter, after a fall of 9.9 per cent in the second quarter. The decline in investment in construction seems to have been more than offset



Source: European Commission.

Note: The balances of responses correspond to the deviation from the average in 2004-2013 of the three-month average of the original series. by considerable growth in components relating to transport equipment and machinery and equipment, similarly to the case as of late 2013. More specifically, sales of light commercial vehicles grew by 59.9 per cent in the third quarter, following a 55.2 per cent increase in the second quarter, while sales of heavy commercial vehicles increased by 42.4 per cent in the third quarter, after 51.6 per cent growth in the second quarter. Nominal imports of machinery and equipment grew by 6.4 per cent in the third quarter, following a year-on-year increase of 7.8 per cent in the second quarter, amid declining prices for this imports' component.

Exports grew moderately, reflecting similar contributions between the goods and services components.

In nominal terms, exports of goods increased by 1.5 per cent in the third quarter. In the same period, nominal exports of goods excluding fuel grew by 3.0 per cent, in particular exports of clothing and footwear, vehicles, and food and beverages. In turn, and similarly to the two previous quarters, nominal fuel exports declined in the third quarter of 2014 (11.3 per cent).

Tourism exports continued to grow strongly, reflecting the growth of overnight stays by nonresidents, which amounted to 7.9 per cent in the third quarter of 2014, after 6.2 and 13.1 per cent in the first and second quarters respectively. Nominal revenue from travel and tourism also rose considerably, by 13.7 per cent in the third quarter of 2014, from 5.9 and 13.4 per cent in the first and second quarters respectively.

In turn, import growth reflected more buoyant developments in global demand items with higher import content, notably GFCF in transport equipment and in machinery and investment goods and the consumption of durables.

Box 1 | Technical assumptions

Projections shown in this issue of the *Economic Bulletin* are based upon a set of assumptions on the external environment of the Portuguese economy, reflecting data underlying the latest ECB projections released on 4 December (Table 1).

Overall, assumptions on the external environment of the Portuguese economy were revised downwards both for 2014 (compared with the October *Economic Bulletin*) and 2015 and 2016 (compared with the June *Economic Bulletin*).

In this exercise, external demand is anticipated to accelerate over the projection horizon against a background of a gradual recovery in international trade flows worldwide. This acceleration is expected to be broadly based across euro area and non-euro area markets. Economic developments in the euro area are projected to benefit from the non-standard monetary policy measures recently announced by the ECB (Box 3 "Recent non-standard monetary policy measures"). External demand for Portuguese goods and services by non-euro area markets is expected to be less buoyant than in the period before the financial crisis, as well as than euro area demand, contrary to recent developments.

		EB December 2014		EB October 2014		EB June 2014		
		2014	2015	2016	2014	2014	2015	2016
External demand	уоу	3.5	3.7	4.9	3.9	3.5	4.8	5.5
Interest rate								
Short-term (three-month EURIBOR)	%	0.2	0.1	0.1	0.2	0.3	0.3	0.4
Implicit in public debt	%	3.9	3.9	3.9	4.0	3.5	3.5	3.7
Euro exchange rate								
Effective exchange rate index (1999Q1=100)	aav	102.2	99.3	99.3	103.0	104.2	104.4	104.4
Euro-dollar	aav	1.33	1.25	1.25	1.36	1.38	1.38	1.38
Oil prices								
in dollars	aav	101.2	85.6	88.5	107.4	107.2	102.2	98.2
in euros	aav	75.9	68.6	70.9	79.2	77.7	73.9	71.0

Table 1Technical assumptions

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

Notes: yoy - year-on-year rate of change, % – per cent, aav – annual average value. An increase in the exchange rate corresponds to an appreciation. The implicit interest rate on public debt is computed as the ratio between interest expenditure for the year and the simple average of the stock of debt at the end of the same year and at the end of the preceding year. In the *Economic Bulletin* of June 2014 the calculation of this rate used information according to the European System of Accounts (ESA) version 1995, while data released in the Bulletins of October and December are compatible with ESA version 2010.

These developments reflect less dynamic economic activity in some emerging economies than in the recent past (in a number of cases owing to structural constraints to economic growth). Projections released by the ECB on 4 December point to economic growth in the euro area of 0.8 per cent in 2014, 1.0 per cent in 2015 and 1.5 per cent in 2016. These developments show a recovery that is more gradual than in previous recessive episodes.

The technical assumption for the three-month EURIBOR is based on expectations implied in futures contracts. In the period 2014-2016, the three-month EURIBOR is expected to remain at

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historically low levels. The technical assumption for the long-term interest rate is based upon an estimate of the interest rate implied in the Portuguese government debt, including an assumption for the interest rate associated with new debt issuance. The projection assumes the maintenance of regular financing conditions for the Portuguese economy over the projection horizon, with the ten-year interest rate implied in the Portuguese government debt slightly below 4 per cent from 2014 to 2016.

The technical assumption for the exchange rates assumes that throughout the projection horizon they remain at the average values recorded in the two weeks prior to the cut-off date. In annual average terms, this means a depreciation of the euro in 2015 both in effective nominal terms and against the US dollar, after a slight appreciation in 2014.

The technical assumption for the price of oil is based upon information on futures markets. The price of oil is expected to fall from USD 101.2 (EUR 75.9) in 2014 to USD 85.6 (EUR 68.6) in 2015, while the price of oil is assumed to increase slightly in US dollars and in euro (88.5 and 70.9 respectively) in 2016.

The projections for public finances follow the rule used in the Eurosystem projection exercises, only including the policy measures that have already been approved or that are likely to be approved, and that have been specified with sufficient detail. This exercise incorporates the measures included in the State Budget for 2015 and reflects the Constitutional Court decisions of last May and August.

The current estimate points to a 0.5 per cent decrease in public consumption in real terms in 2014. Underlying this figure is an assumption of a marked decrease in the number of public employees (around 4 per cent), offset by the remaining impact of the increase in regular working hours of public employees, from the end of September 2013 onwards, and the very sharp increase in expenditure with concessions to public-private partnerships in the road sector. The volume of public consumption is projected to further decrease in 2015, owing to an additional decline in general government employment (albeit less sharp than in the previous year), partly offset by a positive change in the purchase of goods and services. The current projection for the public consumption deflator incorporates for 2015 the unwinding of 20 per cent of the 2011 wage cuts (in force since mid-September 2014) and a complete unwinding for 2016.

After a very marked cumulative decline in the past few years, public investment is expected to record a positive rate of change in 2014 and a relative stabilisation in 2015-2016.

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Modest recovery of domestic demand and robust export growth

Current projections point to a continuing process of modest economic activity recovery, which is expected to convey average growth in 2014-2016 slightly above that projected for the euro area (Chart 3.1). This implies a GDP level at the end of the projection horizon still below that observed prior to the financial crisis, reflecting a rather significant recomposition of the expenditure structure in real terms (Chart 3.2). In fact, the weight of exports in real GDP is expected to rise by approximately 11 p.p. between 2008 and 2016, to 43 per cent, reflecting the maintenance of the upward trend observed in 2010-2013. On the other hand, notwithstanding the slight increase in the weight of GFCF in GDP considered in the projection horizon, the sharp reduction seen since the financial crisis should still imply a fall in this ratio in average terms between 2008 and 2016 (6 p.p., to around 16 per cent). The weight of private consumption in GDP saw a rather subdued decline in this period, remaining close to 66 per cent of GDP.

This evolution reflects export growth, which is expected to stand at around 5 per cent at the end of the projection horizon, in parallel with a relative stabilisation of average domestic demand growth (excluding changes in inventories) in 2015-2016 compared with 2014. Total domestic demand is expected to decelerate to around 1 per cent in 2015, following 2.3 per cent growth in 2014, accelerating to 1.5 per cent in 2016. This profile reflects some volatility of the contribution of changes in inventories to GDP growth, given that the considerable accumulation of inventories at the start of 2014 is not likely to be repeated in 2015. Due to the high import content of changes in inventories, such volatility is no longer present when analysing the trend of domestic demand net of imports. The contribution from net domestic demand to GDP growth is expected to remain more or less constant in 2014-2016 at around 0.6 p.p. (Chart 3.3). After a decline in 2014, the contribution from net exports is expected to





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





Sources: *INE* and Banco de Portugal. Note: (p) – projected. increase to around 0.9 p.p. of GDP in 2015-2016 (close to the figure observed in 2012-2013).

Chart 3.4 shows that the weight of domestic demand excluding import contents in nominal GDP has been declining since 2010, a trend that will likely continue throughout the projection horizon. On the other hand, the weight of exports less the respective import content, which reflects the actual contribution from this component to the creation of domestic value added, is expected to remain on an upward trend.

Continued reorientation of the economy towards the tradable sectors, including investment in high import-content goods

Over the projection horizon, growth of activity in the private sector is expected to exceed that of total GDP, given that activity in the public sector is expected to continue to decline, although at a gradually slower pace, constrained by the fiscal consolidation process. In particular, further cuts in public employment in 2014 and 2015 and a stabilisation in 2016 are expected during the projection horizon (Box 1 "Technical assumptions").

After a 1 per cent decline in 2013, Gross Value Added (GVA) is expected to evolve in line with GDP over the projection horizon. Activity in sectors producing tradable goods and services is expected to accelerate over the projection horizon, in a context of recovery of business GFCF and continued buoyancy of exports, which should also imply an increase in imports, associated with the high import content of these components. Activity in the construction sector is projected to show some recovery in 2015-2016, in line with developments in housing investment, resuming positive rates of change, after a downside period that should imply that the level of activity in this sector in 2014 stands at around 55 per cent of its level in 2007. According to the European Commission's confidence survey, financial restrictions are not a very significant factor limiting production in the manufacturing and services sectors, although they are deemed



Chart 3.3 • Gross and net contributions to GDP growth | In percentage points

Chart 3.4 • Weight of domestic demand and exports excluding import content in nominal GDP | In percentage



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

Sources: INE and Banco de Portugal.

Notes: (p) – projected. For each year, the left-hand bar refers to gross contributions from each GDP component and the right-hand bar to the corresponding net contributions. to be among the most relevant factors by surveyed construction companies. This illustrates the ongoing changes in the structure of credit granted by the banking system, more oriented towards the tradable sectors.

Notwithstanding anticipated GDP growth, the level of activity is expected to still stand below potential over the projection horizon. In effect, according to information of the European Commission's opinion surveys, the level of capacity utilisation in manufacturing still stands below its long-term average, in spite of the increase observed in 2014. The level of capacity utilisation in services also recovered somewhat since late 2013, but stands at levels below those observed in the second half of 2011 (which corresponds to the start of this series). As regards corporations which consider that insufficient demand is a factor limiting production, this indicator suggests greater buoyancy of tradable sectors compared with non-tradable sectors, where demand is still below its trend level. In effect, in the case of manufacturing, this indicator is close to an average reference value (2001-2013 period), while in the case of services it still stands clearly above the average (Chart 3.5).

European Commission opinion surveys also include a question on the importance of insufficient labour force as a factor restraining production. In this case, the balance of respondents presents a negative differential *vis-à-vis* the long-term average, which is even more marked that in the case of the questions on demand, suggesting that unemployment is still above its structural level, notwithstanding the recovery of employment in the most recent quarters.

In fact, employment growth in the private sector in the year as a whole, considering information from Quarterly National Accounts published for the first two quarters of 2014, is expected to exceed that of activity (2.7 per cent). As a result of these developments, the labour factor is projected to contribute very significantly to GDP growth in 2014. These dynamics must however be qualified within a more comprehensive analysis of several statistical sources (Box 2 "Recent employment developments in the Portuguese economy").3 During the remaining projection horizon, employment developments in this sector are expected to be more in line with its historical relationship with GDP growth. The contribution of the capital factor to GDP growth over the projection horizon is expected to continue to be marginally negative, given that the recovery of GFCF will not yet be enough to offset the depreciation of the capital stock. GDP growth in 2015-2016 may benefit from favourable developments in productivity, in the context of an improvement in the allocation of resources in the economy, namely associated with developments in new credit flows (Box 4 "Recent evolution of the risk profile of credit granted to the Portuguese non-financial corporations").

Recovery of private consumption and GFCF, albeit still affected by high indebtedness levels

Projections point to 2.2 per cent growth of private consumption in 2014, followed by a slight deceleration to 2.1 per cent in 2015 and 1.3 per cent in 2016 (Chart 3.6).

This decelerating profile reflects developments in consumption of durable goods, which, after starting a recovery trend in 2013, is expected to grow by around 16 per cent in 2014, and approximately 4 per cent in 2015-2016. Growth projected for 2015-2016 slightly exceeds that of real disposable income, broadly in line with the historical elasticity among these two aggregates. At the end of the projection horizon, however, consumption of durable goods is expected to still stand approximately 20 per cent below its level in 2008.

After the fall in the 2011-2013 period, consumption of non-durable goods is expected to accelerate in 2014 and 2015, followed by a slight deceleration in 2016. This component is anticipated to maintain at the end of 2014 the accelerating trend projected for the third quarter, 16

in line with indications of continued improvement of consumer confidence. Nevertheless, the relative stagnation in the first half of the year may imply that growth of this aggregate in 2014 as a whole falls short of that projected for real disposable income, implying a slight increase in the savings rate to around 10 per cent of disposable income, i.e. a level close to



Sources: European Commission and Banco de Portugal calculations.



Chart 3.6 • Consumption, disposable income and savings rate | Annual rate of change, in percentage

Chart 3.7 • Debt of the non-financial private sector | End of period figures



Non-financial corporations - Total debt (a) (as a percentage of GDP)
 Households - Financial debt (b) (as a percentage of disposable income)

Sources: INE and Banco de Portugal.

Notes: (p) - projected.

(a) It includes loans granted to non-financial corporations by other institutional sectors; commercial paper and bonds issued by non-financial corporations held by other sectors and trade credits received from other sectors.

(b) The financial debt corresponds to loans and debt securities issued by the sector.

Sources: *INE* and Banco de Portugal.

Note: (p) - projected. The savings rate is expressed as a percentage of disposable income.

that observed before the start of the euro area. In 2015-2016, the savings rate is expected to remain stable. This developm ent is consistent with the continued decline in household indebtedness as a percentage of disposable income over the projection horizon, corresponding to a significant decline of around 17 p.p. over the 2011-2016 period (Chart 3.7).

In mid-2013 GFCF discontinued the downward trend observed since 2009, implying a fall in the level of this aggregate of around 30 per cent. GFCF is thus projected to change by 2.2 per cent in 2014, 4.2 per cent in 2015 and 3.5 per cent in 2016 (Chart 3.8). These developments largely reflect the accelerating trend projected for business investment, from -2.4 per cent in 2013 to 2.8 per cent in 2014 and 4.9 per cent on average in 2015-2016. The significant increase in the weight of GFCF on GDP during the recovery periods, which reflects the heightened volatility and the pro-cyclical nature of investment, has been much more moderate in the current cycle (Chart 3.9). This reflects the continued need to reduce the level of corporate indebtedness, which will persist over the projection horizon, given that, notwithstanding the recent fall, similarly to the household sector, it remains very high, when compared with the euro area average (Charts 3.7 and 3.10).

The recovery of corporate investment, however, may benefit from some improvement in firms' demand expectations and financing conditions. In effect, a gradual reduction is projected for spreads in loans to non-financial corporations, when compared with the reference interest rate of the interbank market and a return to positive changes in the credit stock at the end of the projection horizon, even though consistent with the continued decline in corporate indebtedness as a percentage of GDP. Such developments are consistent with a change in the structure of corporate financing, preferably more based on equity, and in which credit is reoriented towards more productive corporations.

Current projections also include a smaller decline in housing investment in 2014 and some recovery in 2015-2016, broadly in line with developments in disposable income. The relatively moderate growth projected for this component reflects the fact that the decline in invest-



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

Chart 3.9 • Ratio of business GFCF to GDP | Index t-1=100



Sources: *INE* and Banco de Portugal.

Note: Dotted values correspond to projections. The reference t-1 corresponds to the last year of business GFCF growth before a recession.

ment in housing is largely of a structural nature. The level of this component in real terms is likely to stand in 2014 at around 30 per cent of its value in 2000, the year after which it started to decline. These developments reflect the very high level reached by investment in this sector during the 1990s, benefiting from very favourable financing conditions, as well as the recent downward trend of resident population and the still high level of household indebtedness.

Moreover, public investment is expected to continue to be affected by fiscal consolidation requirements, given that, after a 5.6 per cent rise in 2014, it is expected to stabilise somewhat, on average, in the 2015-2016 period, after an accumulated fall of approximately 60 per cent in 2011-2013.

Deceleration of exports in 2014 and growth in line with external demand in 2015-2016

Projections for exports of goods and services point to growth of 2.6 per cent in 2014, 4.2 per cent in 2015 and 5 per cent in 2016. In 2014

exports are expected to grow less than external demand, discontinuing the upward trend of the market share observed since 2011 (Chart 3.11). This development in market shares in 2014 is significantly affected by the energy component, reflecting the temporary closure of a refinery unit in the first quarter of the year (Chart 3.12). In effect, exports excluding energy are expected to grow approximately in line with the external demand for goods and services. The partial reversal of this effect in the second half of the year is likely to favour export dynamics in 2015. Over the remaining projection horizon, exports are expected to show an accelerating trend broadly in line with assumptions about external demand for Portuguese goods and services. These developments include the maintenance of buoyant growth of exports of services, in particular tourism related. As a result of these developments, a relative stabilisation of market share is projected for 2015-2016.

In 2014, imports of goods and services are projected to grow by 6.3 per cent, reflecting an increase in import penetration similar to that recorded in 2013, resulting in a relative

Chart 3.10 • Debt of the non-financial private sector | In percentage of GDP



Sources: Eurostat and Banco de Portugal calculations.

Notes: Data refers to 2012, with the exception of Belgium, Greece, Portugal and Slovenia, for which data refers to 2013. Includes loans, and in the case of non-financial corporations, also debt securities and comercial credit (except in the case of Greece, where information on comercial credit is not available). The information is in line with the ESA 1995 framework.

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stability of this indicator in the 2011-2014 period (Chart 3.13). The recent buoyancy of imports is the result of developments in high import-content expenditure components, such as changes in inventories or business investment (although more mitigated in the latter case than in previous cycles). The growth of these components is usually higher in the context of a rebound in activity, due to the need of restocking to average levels, in the wake of periods of destocking or lower maintenance of capital goods subject to depreciation.

In the course of the remaining projection horizon, imports are expected to evolve more in line with this component's historical average elasticity to developments in overall demand weighed by import content, resulting in import penetration growth close to its average in the 1996-2013 period.

Maintenance of the Portuguese economy's funding capability

According to current projections, the economy's funding capability, measured by the combined current and capital account, is expected to increase slightly during the projection horizon, from 2.6 per cent of GDP in 2014 to 2.9 per cent of GDP in 2016. Such developments reflect the combination of a slight increase in domestic demand as a percentage of GDP and a relative stabilisation of total investment (Chart 3.14).

In 2014, developments in the balance of payments as a percentage of GDP are expected to be characterised by a decline in the goods and services account surplus, due to the above-mentioned developments in the volumes of exports and imports, notwithstanding the improvement in terms of trade - both total and non-energy (Chart 3.15). These developments should however be offset by a decline *vis-à-vis* the previous year in the deficit of the combined primary and secondary income account observed in the first three quarters of 2014. In 2015-2016 figures for the goods and services account, as a percentage of GDP, are projected to be slightly higher than in 2013. These developments reflect a fall in the goods account deficit, largely resulting from a volume effect, in tandem with additional gains



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

Chart 3.12 • Breakdown of the rate of change in exports | Contributions in percentage points





in terms of trade in 2015, against the background of a decline in oil prices in euro terms. The slight increase in the services account balance in percentage of GDP is also likely to contribute to this trend. Primary and secondary income accounts and the capital account are projected to show a slight decline in their balance as a percentage of GDP in 2015 - taking into account expectations of lower receipts of transfers from some European Union structural funds, in line with information contained in the State Budget for 2015 - and relative stability in 2016.

Compared with previous Banco de Portugal's projections for the 2014-2016 period, published in the June and October 2014 issues of the Economic Bulletin, current projections are characterised by marginal revisions of GDP growth, notwithstanding a different expenditure composition.

Projections for GDP growth relatively unchanged from previous Economic Bulletins

The projection for GDP growth in 2014 remains relatively unchanged from the October issue of the Economic Bulletin, reflecting an upward revision of private consumption and GFCF and a downward revision of exports, as a result of the incorporation of latest information, as well as a downward revision of assumptions about growth of the external demand for goods and services. Projections for GDP growth in 2015 and 2016 are virtually unchanged from the June 2014 issue of the Economic Bulletin, also envisaging a revision of the composition of demand towards higher buoyancy of consumption and GFCF in 2015.

4. Prices and wages

Chart 3.14 • Developments in financial

requirements | In percentage of GDP

Consumer prices have been decelerating since 2012, in the context of a deteriorating cyclical position of the Portuguese economy and declining prices of imports excluding energy.

According to the projection for 2014, prices are expected to remain stable from the previous year (-0.1 per cent change), with an accumulated change of -0.2 per cent up to October 2014. This virtual stabilisation of prices reflects the moderate developments of domestic demand and the labour market, combined with the fall

(p)

(p)

(p)



Note: (p) - projected.

Chart 3.13 • Imports and import-content weighted overall demand | In percentage



Total investment

Domestic savings

- - Domestic savings and capital account balance

Current plus capital account

Note: (p) - projected.



in import prices, within a low inflation context in the euro area.

Gradual price increase over the projection horizon

Over the projection horizon inflation is likely to remain at low levels. After a relative price stabilisation in 2014, inflation is projected to increase gradually to 0.7 per cent in 2015 and 1.0 per cent in 2016 (Chart 4.1).

Reflecting oil price developments, energy prices are expected to decline in 2015 and increase at the end of the projection horizon, remaining however at lower levels than those observed at the start of the projection horizon. For 2015 the decline in energy consumer prices will be mitigated by a rise in the tax on oil products and energy, set out in the State Budget for 2015.

The maintenance of internal and external downward pressures on prices, in a context of moderate recovery of Portuguese and world economies, is projected to determine moderate developments in prices excluding energy. After stabilising in 2014, the prices of this component are expected to grow by slightly less than 1 per cent in 2015 and 2016. Comparing Banco de Portugal's projections with those for the euro area, published by the ECB on 4 December, the inflation differential will be negative in 2014. In the January-October 2014 period, the negative price differential was broadly based across the main components of the Harmonised Index of Consumer Prices (HICP), except energy. In 2015 the inflation differential will be virtually nil, to be negative again in 2016, albeit low in absolute value. In the context of a monetary union, countries under a structural adjustment process, as Portugal, are expected to register inflation rates below the average in the other member countries.

Moderate price developments excluding energy will occur in a framework of moderate recovery of the Portuguese economy and slightly less unfavourable conditions in the labour market. Current projections include a moderate rise in private sector wages during the projection horizon, which will contribute to a positive change in unit labour costs in the private sector, albeit relatively stable and contained from 2014 to 2016, on average below 1 per cent.

Excluding energy, import prices are likely to increase moderately from 2015 onwards, after



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

falling in 2013 and 2014. This evolution will be strengthened by the assumption pointing to a depreciation of the euro in 2015.

The moderate rise in prices over the projection horizon will also reflect contained increases in the profit margins of the economy, measured by the gross operating surplus per unit of output.

Expectations of a gradual increase in inflation in the medium term

In spite of the low levels, inflation expectations also point to a gradual increase in inflation in the medium term (Chart 4.2). In effect, expectations over a 12-month horizon interrupted the downward trend since August 2014.

Downward revisions of projections for inflation in 2014 and 2015

Projections for consumer price developments have been revised downwards over the projection horizon, particularly in 2015. The downward revision largely reflected the component excluding energy. That revision chiefly reflected the incorporation of the most recent HICP figures that are lower than anticipated in previous Economic Bulletins, namely in unprocessed food and non-energy industrial goods. The energy component was also revised downwards in 2014 and 2015, mainly reflecting the revision of the assumptions regarding oil price developments. This revision incorporates information available as at 19 November.

5. Uncertainty and risks

Projections in this Bulletin represent the scenario deemed most likely, based on the set of assumptions described in Box 1 "Technical assumptions". The non-materialisation of such assumptions and the likelihood of events that, due to their idiosyncratic nature, were not taken into account in the projections, give rise to risks and uncertainty. The quantified analysis of the risks and uncertainty surrounding the projections is presented in this section.⁴

At the international level, there is the risk of slower recovery of economic activity, in both the euro area and emerging economies, as well as more



Chart 4.1 • Harmonized index of consumer prices

| Contribution to the annual rate of change,

Sources: Eurostat and Banco de Portugal.

Note: (p) - projected.





Sources: Consensus Economics and Banco de Portugal calculations.



moderate developments in international trade flows. The materialisation of this risk would result in lower growth of external demand for Portuguese goods and services over the projection horizon. This risk is deemed to have a materialisation probability of 60 per cent in 2015 and 55 per cent in 2016 (Table 5.1). The downside risk of the development of global economic activity would also result in a downside risk on the oil price, reflecting lower demand. This risk, however, is offset by an upward risk reflecting the possible intensification of geopolitical tensions in energy-producing countries.

Table 5.1Risk factors – Probability of an outcome below the implicit in the projectionsIn percentage

2015	2016
60	55
60	60
45	45
45	45
	2015 60 60 45 45

Source: Banco de Portugal.

 Table 5.2
 Probability of an outcome below the projections | In percentage

	Weights	2015	2016
Gross domestic product	100	53	57
Private consumption	65	48	50
GFCF	15	45	46
Exports	39	52	56
Imports	38	48	49
HICP		51	52

Source: Banco de Portugal.

The risk of occurrence of these geopolitical tensions also contributes to a risk of appreciation of the euro. In turn, due to the normalisation of monetary policy in the United States and the possible implementation of additional non-standard measures in the euro area, there is also a risk factor linked to the possibility of depreciation of the euro. Against this background, risks to the exchange rate are deemed to be balanced.

At the domestic level, there seems to be an upward risk associated with a possible positive impact of structural reforms, in both exports and investment.⁵ There is a probability of 55 per cent that export and investment developments are more favourable in 2015 and 2016 than set out in the projections. Moreover, additional measures may be required for meeting the budgetary targets, which translates into a probability of 60 per cent that public consumption in 2015 and 2016 may be short of the projections (Box 5 "Fiscal outlook for 2015").

Downside risks for economic activity in 2015 and 2016

In view of this risk balance, economic activity developments will be subject to slightly downward risks in 2015 and 2016, resulting from the above-mentioned combination of risk factors (Table 5.2 and Chart 5.1). In 2015 uncertainty on real economy developments is also assumed to increase slightly, associated with the impact on economic agents' decisions of developments in the financial system in the second half of 2014.

As regards consumer prices, the analysis points to marginally downward risks in 2015 and 2016 (Table 5.2 and Chart 5.2).

However, the cut-off date of the technical assumptions is 19 November, and therefore these do not reflect the recent fall in oil prices. Such developments may imply additional downward pressure on prices in the next few months.

6. Conclusions

The current macroeconomic projections point to a gradual recovery of the Portuguese economy in coming years, slightly above the growth levels expected for the euro area. The dynamics of the Portuguese economy will continue to be mainly ensured by the export performance, in tandem with a recovery of domestic demand, which will be consistent with the maintenance of current and capital account surpluses. In addition, the projections are consistent with an allocation of resources increasingly oriented towards the tradable and most productive sectors of the economy. Nevertheless, the projected growth potential for the Portuguese economy over the projection horizon is relatively limited. Indeed, the deleveraging of the public and private sectors, the demographic developments, the limited levels of productive capital per worker and the modest dynamism forecasted for the main trade partners - particularly as regards the euro area as a whole - will continue to constrain the growth potential of the Portuguese economy in the future.

In recent years, there was a strong adjustment of the Portuguese economy, with a notable progress in the correction of macroeconomic imbalances. However, the structural rebalancing process of the economy is still incomplete and the macroeconomic adjustment requires further deepening. Simultaneously, the internal and external risks pending on the Portuguese



Chart 5.2 • Harmonized index of consumer prices | Rate of change, in percentage

Source: Banco de Portugal.

Chart 5.1 • Gross domestic product

Rate of change, in percentage

Source: Banco de Portugal.

economy should not be ignored. Against this background, it is crucial to comply with the commitments established at the European level in terms of the fiscal consolidation process, which are indispensible to sustain a downward trend of the public debt ratio. In parallel, the structural reform process towards the creation of incentives to innovation, factor mobility and investment in physical and human capital should be further fostered. A wide consensus around this process is fundamental to increase the credibility, predictability and capacity to implement the set of supporting policies.

The above conditions are indispensible to promote a better allocation of resources and productivity growth, thus contributing to sustainably increase the levels of economic welfare in Portugal.

Box 2 | Recent dynamics of employment in the Portuguese economy

According to the Labour Force Survey, total employment increased 2.1 per cent in the third quarter of 2014 year-on-year, after an increase of 1.8 per cent in the first half of the year and a 2.6 per cent fall in 2013 as a whole. This behaviour reflects the positive contribution of employees, while selfemployed fell more sharply during 2014. These dynamics of total employment and its composition raise questions when compared with developments observed in economic activity. In this context, this Box aims to qualify the recent developments in employment in the Portuguese economy, using a broader set of statistical sources. The analysis made indicates that the number of employees in the private sector has been recovering since the third quarter of 2013, but more moderately than suggested by the Labour Force Survey. Active employment policies are also contributing to this increase in employment volume, in particular professional internships. In contrast, employment in the general government is on a decreasing trend. In this context, developments in employee numbers seem to have remained broadly consistent with economic activity.

As mentioned in the *Economic Bulletin* of October 2014, and emphasised by INE in the highlights of the Employment Statistics for the 3rd quarter of 2014, the Labour Force Survey's sample has been updated with the gradual integration of the 2011 Census results since the third quarter of 2013.⁶ This update brings improved coverage in the sample basis. Given the sampling nature of this survey and the intrinsic variability of surveys by sample, the procedure adopted (which, as standard, does not allow for counterfactual) may lead to greater uncertainty in the results of the Labour Force Survey during the transition period.⁷

Taking as a reference the sample's common component of two consecutive quarters of the Labour Force Survey,⁸ it is possible to conclude that the current transition to the new sampling frame is contributing to a greater fluctuation of data regarding employment developments and its composition. Thus, over this period of greater uncertainty and volatility the joint analysis of all the information and indicators available relating to the labour market situation in Portugal is particularly important.

The analysis that follows is based on information from the *Ministério da Solidariedade, Emprego e Segurança Social (MSESS)*, the *Direção Geral da Administração e Emprego Público (DGAEP)*, the *Instituto do Emprego e Formação Profissional (IEFP)* and *INE*. This analysis provides information on developments in the number of employees in the private sector and the general government. Regarding the self-employed – representing less than 20 per cent of total employment – there is no alternative source offering a full assessment of their evolution in the recent past.

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The information available corroborates the recovery in the number of employees in the private sector during 2014, although more moderately than that implied by the Labour Force Survey. Based on data from MSESS, employees contributing to the Social Security scheme are growing 1.9 per cent year-on-year in the third quarter of 2014 (with growth of +1.2 per cent in the first half of the year and -3.2 per cent in 2013 as a whole). This database, which is continuously updated, is missing a percentage of declarations, mainly in the last four months, which could represent around 0.4 percentage points (p.p.) of the year-on-year change in the last quarter available. These employees include civil servants contributing to the Social Security scheme along with members of Statutory



Chart 1 • Private and General Government employees | Year-on-Year rate of change

Sources: Instituto de Informática do Ministério da Solidariedade, Emprego e Segurança Social, Direção Geral da Administração e Emprego Público, INE and Banco de Portugal calculations.





Bodies. The data provided by DGAEP and INE indicate that the number of civil servants contributing to the Social Security scheme is also in slight decline, meaning that private sector employees are growing more than total employees, the latter estimated at around 0.2 p.p.. This suggests that private sector employees are growing around 2.5 per cent year-on-year in the third quarter of 2014, after growing 1.6 per cent in the first half of the year (Chart 1). Employees in the private sector have grown overall since 2013, albeit remaining at levels clearly below those recorded until 2011 (Chart 2).

Aside from the information from *MSESS*, there are also indicators available on employment developments and the number of hours worked obtained from statistical operations carried out by *INE* among employers that corroborate the recent positive employment developments.

In the recent past, the active employment policies may have contributed to employment developments, in particular among employees. According to the data from the *IEFP*, the number of individuals in professional internships is increasing, particularly from the last quarter of 2013 (Chart 3). In particular, it is estimated that the considerable growth of professional internships in the last year has contributed to the year-on-year growth of employees in the private sector at around 0.9 p.p. in the third quarter of 2014 (0.8 p.p. in the first half of the year).⁹

Regarding employment in the general government, according to *DGAEP* data, the number of civil servants is continuing to fall, having fallen 3.6 per cent in the third quarter of 2014 year-on-year, a similar change to that of the first half of 2014 (Chart 1). These developments may reflect not only the falling number of the Portuguese civil servants pension sub-system (*CGA*) subscribers, but also the falling number of civil servants contributing to the Social Security scheme.

Given the specifics and uncertainty inherent in the various information sources regarding the labour market, in particular the above-mentioned period of transition, a comprehensive analysis of all the indicators available is relevant. This procedure is particularly important given the recent developments in the Portuguese economy, with specific regard to the labour market. In particular, the analysis presented in this Box suggests that the recent dynamics of employment may not be inconsistent with the moderate activity growth over this period.



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Box 3 | Recent non-standard monetary policy measures

Over the past few months, the Governing Council of the European Central Bank (ECB) has announced a number of measures intended to provide further monetary policy accommodation. In addition to cuts in the key ECB interest rates, the Governing Council decided to implement a number of non-standard monetary policy measures. The latter are part of a credit support policy in the euro area and aim specifically at improving the functioning of the monetary policy transmission mechanism, in order to support lending to the real economy and reduce the cost of credit in the markets whose functioning is not normalised. This box focuses on the non-standard measures taken in June and September, in particular the adoption of targeted longer-term refinancing operations and the asset-backed securities and covered bond purchase programmes.

In June 2014 the ECB decided to conduct a series of targeted longer-term refinancing operations (TLTROs), in order to support bank lending to non-financial corporations and households (excluding loans to households for house purchase). The first of these operations was conducted in September, to be followed by another in December. The cumulative amount of loans that the counterparties are entitled to borrow in these two TLTROs cannot exceed an amount corresponding to 7 per cent of the total amount of their loans to non-financial corporations and households (excluding loans to households for house purchase) outstanding on 30 April 2014. In aggregate terms, the maximum amount provided in these two operations may reach approximately 400 billion euro. Subsequently, in the period from March 2015 to June 2016, all counterparties will be able to borrow additional amounts in a series of TLTROs to be conducted quarterly. These additional loans may reach up to three times the difference between the amount of each counterpart/s net lending to non-financial corporations and households (excluding loans to households for house purchase) after 30 April 2014 and a specified benchmark individually pre-defined for each counterparty.¹⁰ All TLTROs will mature in September 2018, corresponding to a maturity of approximately four years for the operations conducted in 2014. The counterparties may pay back any fraction of the amounts allotted after 24 months and with a periodicity of six months. The interest rate applicable on TLTROs is fixed, corresponding to the main refinancing operation rate prevailing at the time of take-up, plus 10 basis points. Finally, note that if net lending to non-financial corporations and households (excluding loans to households for house purchase) between 1 May 2014 and 30 April 2016 is lower than the benchmark, the counterparties will be required to pay back the full amount of their borrowings in September 2016.11

Taking into account the predominance of banks in financing the euro area economy, TLTROs are expected to play a significant role in enhancing the transmission of monetary policy and to facilitate new credit flows to the real economy. Obviously, the macroeconomic impact of this measure depends on the banks' response, which will be determined by both their lending activity and the availability and cost of other sources of funding. In the first TLTRO, conducted on 18 September 2014, the ECB allotted 82.6 billion euro. The second operation will be conducted on 11 December. Due to their design, the operations conducted in September and December must be assessed together.

In September, the ECB announced the operational details of the asset-backed securities purchase programme (ABSPP), in accordance with the decisions made in June, and the new covered bond purchase programme (CBPP3).¹² These programmes are expected to contribute to the improvement of the monetary policy transmission mechanism, facilitating credit provision to the economy, either directly in these financial instruments' markets, or by generating positive spill-overs to other markets. The ABSPP envisages the purchase of a broad portfolio of simple and transparent securities

denominated in euro with underlying assets consisting of claims against the euro area non-financial private sector. The CBPP3 targets securities backed by mortgages and credit to the public sector issued in euro by euro area monetary financial institutions. Taken together, in the two programmes, the universe of securities that qualify for purchase by the Eurosystem reach around 1,000 billion euro, but the programmes are also likely to have a stimulating effect on issuance. The CBPP3 and the ABSPP were launched in October and November respectively and are expected to last for at least two years. Purchases are made in the primary and secondary market and the Eurosystem collateral framework is the guiding principle for eligibility. In the cases of Greece and Cyprus, a derogation was applied based on the fulfilment of specific requirements, enabling the inclusion in these programmes of instruments originating in these two jurisdictions. Purchases under the ABSPP and the CBPP3 amounted approximately to 0.4 and 18 billion euro respectively on 28 November.

The measures described above are expected to have a sizeable impact on the size and composition of the Eurosystem's balance sheet, which is due to increase to early 2012 levels. Thus, the ECB anticipates a potential rise in the Eurosystem's total balance sheet from approximately 2,000 billion euro in early November 2014 to around 3,000 billion euro, i.e. the level recorded in March 2012. The measures will affect the economy mainly through the three following transmission channels: (1) a direct pass-through channel, in which the reduction of creditors' financing costs in specific market segments is transmitted directly to debtors; (2) a portfolio rebalancing channel, given that the significant liquidity expansion associated to the above-mentioned measures fosters the diversification of investors' investment patterns to other financial instruments, thereby facilitating financing conditions in general; (3) and a signalling channel, given that the announcement of a significant package of non-standard measures may help support the ECB's forward guidance policy and determination to maintain an accommodative monetary policy stance for a longer period.

The ABSPP will supplement the TLTROs triggering the direct pass-through effects mentioned above, considering that the asset-backed debt market currently lacks efficiency and given the significant correlation between these instruments' spreads and the interest rates on loans backing these securities. In turn, the CBPP3 will largely supplement the ABSPP, reinforcing the portfolio rebalancing effects and the signalling effects referred to above.

The TLTROs and the asset-backed securities and covered bond purchase programmes are expected to have a significant impact on the Eurosystem's balance sheet and further enhance the forward guidance and the transmission of monetary policy. Ultimately, the increase in the accommodative stance of the monetary policy will contribute to a return of euro area inflation to levels below but close to 2.0 per cent. In this context, it is important to note that the ECB has emphasised the commitment to resort to additional non-standard instruments, under its remit, where necessary to fight the risks associated with a protracted period of low inflation. 29

Box 4 | Recent developments in the risk profile of loans to enterprises in Portugal

The quality of credit allocation is key to determining the overall allocation of resources and boosting economic growth (see Reis, 2013, and Dias *et al.*, 2014). Against this background, this box analyses recent developments in loans granted by the banking system to private non-financial corporations in Portugal, according to their risk profile. To this end, below is a breakdown of loans both in terms of size and price, according to the risk profile of enterprises.

Corporate risk is calculated on the basis of the work developed by Martinho and Antunes (2012), which estimates an econometric model for the probability of default (*z-score*) at enterprise level. Using this estimate, it is possible to obtain a distribution of risk for nearly all non-financial corporations in the Portuguese economy. This box estimates *z-scores* for the period 2012-14 on the basis of the latest microeconomic data from *Informação Empresarial Simplificada* (Simplified Corporate Information).

Chart 1 – Distribution of credit by *z-score** shows the share of loans granted by the banking system to private non-financial corporations in the deciles of the risk distribution in September 2014. Data on loans were calculated on the basis of the Central Credit Register. This analysis shows that the largest share of loans in September 2014 is in the deciles with a higher level of risk and that there is an overall increasing relationship between credit risk and the respective weight in the total portfolio of the banking system. In effect, the first two risk deciles (lower risk of default) correspond to 2.3 per cent of the total loan portfolio and the last two deciles (higher risk of default) to 30.1 per cent of the total loan portfolio.

In the past few years, the rate of change in credit has become increasingly more sensitive to the risk profile of enterprises. This is illustrated by Chart 2 – Rate of change in credit by *z-score**, which shows the annual rates of change in credit (from September to September) within each risk decile for the past three years individually. In 2012 the rates of change in credit were negative in all risk deciles and no evidence exists of a differentiation in loans according to risk. However, this situation changed in 2013 and, particularly, 2014, when the rates of change in credit were clearly positive for lower levels of risk and negative for higher levels of risk. In 2014, in particular, a virtually linear negative relationship was observed between the rates of change in credit and the level of risk of enterprises.

An analysis of developments in interest rates on new loans also confirms this differentiation according to the risk profile of enterprises. Charts 3 and 4 show the distribution of interest rates on new loans (in September in the period 2012-14) for the two sub-samples constructed according to the risk profile of enterprises. Enterprises in the first deciles of the risk distribution (Chart 3 "Distribution of interest rates for new loans – low risk") are considered to have a low level of risk and those in the last two deciles of the distribution (Chart 4 "Distribution of interest rates for new loans – high risk") a high level of risk. In both cases, the distribution of interest rates shifted to the left, corresponding to a broadly based decrease in interest rates. However, the distribution shifts more strongly to the left in the case of enterprises with a lower risk profile. In addition, the difference between the 25th and 75th percentiles of the interest rate decreased from 503 b.p. (basis points) in 2012 to 360 b.p. in 2014, for low-risk enterprises, while increasing from 520 b.p. in 2012 to 516 b.p. in 2014 for high-risk enterprises. This evidence seems to support the idea that competition between credit institutions as regards lower-risk customers has increased in the past few quarters.

Overall, this analysis shows that the banking system has gradually granted more loans to enterprises in the lower-risk deciles, with these enterprises obtaining higher interest rate reductions than those in the higher-risk deciles.

References

Dias, D., C. R. Marques and C. Richmond, 2014, "Resource allocation, productivity and growth in Portugal", *Economic Bulletin*, October 2014, Banco de Portugal.

Martinho, R. and A. Antunes, 2012, "A scoring model for Portuguese non-financial enterprises",

Financial Stability Report, November 2012, Banco de Portugal.

Reis, R., 2013, "The Portuguese slump and crash and the euro crisis", *Brookings Papers on Economic Activity*, Spring.



Chart 2 • Rate of change in credit by *z*-score*



*Yearly rate of change calculated for each September. Lower *z*-score corresponds to a lower probability of firm credit default. *Z*-scores are calculated with most up to date IES information.







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Box 5 | Fiscal outlook for 2015

The State Budget (SB) for 2015 recently approved by the Portuguese Parliament has set at 2.7 per cent of GDP next year's target for the general government deficit in national accounts. According to this document, in 2014 the deficit will stand at 4.8 per cent of GDP, a figure that has underlying temporary operations that, as stated by the Ministry of Finance, have a deficit-increasing impact of 1.1 per cent of GDP.¹³ The 2015 deficit target now made public stands above the 2.5 per cent of GDP objective confirmed in last April's Fiscal Strategy Document (FSD).¹⁴ Nonetheless, it allows for the correction of the excessive deficit.¹⁵ Moreover, its materialisation implies, for the third consecutive year, a primary surplus that is foreseen to increase to 2.2 per cent of GDP (after 0.3 per cent in 2014).

In the framework of the SB, the 2015 fiscal consolidation strategy was revised vis-à-vis the FSD.¹⁶ The reassessment of the consolidation measures foreseen for 2015 resulted in a more revenuebased composition and its overall impact stands at 0.7 per cent of GDP. Among the measures introduced by the 2015 SB, it is worth highlighting on the revenue side: (i) increases in the Road Service Contribution, the Banking Sector Contribution and the Energy Sector Contribution; (ii) an increase in taxation on tobacco and alcoholic beverages; (iii) the end of the safeguard clause within the scope of the Municipal Tax on Real Estate; (iv) a new tax on online gambling; (v) a legal authorisation for the establishment of a new tax on the pharmaceutical industry. Additionally, a carryover effect is also expected due to the increase in beneficiaries' contributions to the civil servants' health subsystem, introduced in mid-2014. Overall, the impact of these measures on the fiscal balance is estimated at 0.4 cent of GDP. In October the Reform of the Personal Income Tax and the Reform of Green Taxation were also presented, whose impacts on the 2015 deficit are expected to be limited, offsetting each other. On the expenditure side, in addition to adverse effects on the deficit arising from the elimination of the Extraordinary Solidarity Contribution and the reversal of the wage cuts, the maintenance of a decline in the number of public employees is also foreseen, as well as the establishment of a cap on the amounts of non-contributive social payments received by individuals, and the introduction of a surcharge on the highest pensions. Furthermore, the 2015 SB includes a set of temporary measures related to proceeds from concessions with an impact of 0.1 per cent of GDP.

According to the general government estimates in national accounts presented in the 2015 SB, the decrease in the fiscal deficit expected for 2015 chiefly stems from developments on the expenditure side (Table 1). Regarding total revenue, the estimates presented in the SB Report point to a 3.2 per cent growth, with a slight increase in the respective ratio to GDP (to 44.6 per cent). This results to a large extent from an increase in revenue from taxes on production and imports (7.9 per cent), as revenue from taxes on income and wealth is expected to grow by 2.5 per cent. Given the evolution of the macroeconomic bases and the measures taken into account, the figures released suggest the inclusion in the projection of additional tax administration efficiency gains. In the case of total expenditure, the estimate in the SB Report points to a 1.1 per cent reduction, with a significant decline expected for this item's ratio to GDP, to 47.3 per cent. This outcome is affected by the base effect related to the recording in 2014 of the debt of STCP and Carris and the write-off of non-performing loans from the BPN Crédito balance sheet (adjusted for this effect, the rate of change of total expenditure would stand at 0.3 per cent). Regarding the main expenditure items, it is expected a 3.1 per cent decline in compensation of employees and 1.5 and 3.6 per cent increases in social payments and intermediate consumption respectively, although the SB Report has identified a rather significant amount of savings in the latter item.

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	2014 (Percenta	2015 age of GDP)	Rate of change: 2014-2015 (Percentage)	
Total revenue	44.5	44.6	3.2	
of which:				
Taxes on income and wealth	10.8	10.7	2.5	
Taxes on production and imports	13.9	14.6	7.9	
Social contributions	11.8	11.7	1.9	
Capital revenue	1.0	1.0	2.7	
Total expenditure	49.2	47.3	-1.1	
Social payments	19.5	19.2	1.5	
Compensation of employees	11.6	10.9	-3.1	
Intermediate consumption	5.8	5.8	3.6	
Interest	5.0	4.9	1.1	
Investment	2.4	2.4	1.8	
Total balance Primary balance	-4.8 0.3	-2.7 2.2	-	
Public debt (Maastricht definition)	127.2	123.7	-	

Table 1 • Main fiscal indicators in national accounts

Source: Ministry of Finance.

According to the estimates based on the 2015 SB, economic activity should contribute 0.8 p.p. of GDP to the improvement in next year's fiscal balance (Figure 1). Given that the share of interest expenditure in GDP should decline slightly, and taking into account the aforementioned impact of temporary measures, the budget foresees the structural primary deficit to remain unchanged in 2015. The estimate for the change in the structural balance is of 0.1 p.p. of GDP, which, if it materialises, will fall short of the minimal 0.5 p.p. of GDP effort stemming from the European commitments.

The projection included in the 2015 SB for the public debt ratio stands at 123.7 per cent of GDP at the end of 2015, declining by 3.5 p.p. of GDP *vis-à-vis* the estimate for the end of 2014 (Table 1 and Figure 2). This evolution chiefly results from a primary surplus of 2.2 per cent of GDP expected for 2015 and the impact of sizeable debt-reducing deficit-debt adjustments (-2.5 per cent of GDP). According to the SB Report, this later impact is to a large extent associated with a decrease in general government deposits and the net acquisition of public debt securities by the Social Security Financial Stabilisation Fund. These effects are partially offset by the dynamic effect, as the implicit interest rate on debt is expected to exceed the growth rate of nominal GDP.

The fiscal strategy for 2015 made public in the SB has underlying non-negligible execution risks.¹⁷ On the one hand, fiscal developments are sensitive to the uncertainty surrounding the macroeconomic scenario, particularly against a background where the forecast for tax revenue growth encompasses tax administration efficiency gains. On the other hand, the consolidation measures on the expenditure side are considered to be limited from the outset. In this regard, within the scope of its assessment of national budgetary plans, the European Commission has

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invited the Portuguese authorities to adopt the consolidation measures required to ensure that the 2015 SB complies with the Stability and Growth Pact rules.

Against this backdrop, it is crucial to ensure the continuation of the consolidation process in Portugal, in order to guarantee the credible fulfillment of the commitments assumed under the Pact and the maintenance of the downward trend of the public debt ratio.




Notes

1. The calculation of import contents was based on data for 2005. For more information, see the Box entitled "The role of domestic demand and exports in economic activity developments in Portugal", in the June 2014 issue of the *Economic Bulletin*.

2. According to the quarterly national accounts released by Statistics Portugal on 28 November 2014, in the third quarter of 2014 GDP grew by 1.1 per cent year on year and by 0.3 per cent from the previous quarter. These figures, as well as their breakdown into demand aggregates, make virtually no changes to the projection presented in this Bulletin.

3. See also the Supply section of the October 2014 issue of the Economic Bulletin.

4. The methodology used in this section is based on Pinheiro, M. and Esteves P. (2012) "On the uncertainty and risks of macroeconomic forecasts: combining judgements with sample and model information", *Empirical Economics*, 42, 639-665.

5. For a short summary of the main results published in literature on the macroeconomic effects of structural reforms, see "Box 7: The macroeconomic effects of structural reforms" in the June 2014 issue of the ECB's *Monthly Bulletin*.

6. This implies that until the last quarter of 2014 the results of the Labour Force Survey will have simultaneously as surveying basis data from the 2001 and 2011 Census. As mentioned by *INE* when the Employment Statistics for the 1st quarter of 2014 were released, the sample rotation is now selected from a sample basis extracted from the *Ficheiro Nacional de Alojamentos* (National Dwelling File), built from 2011 Census data. Thus, from the third quarter of 2013 to the third quarter of 2014, the sample of the Labour Force Survey (which includes six rotations) is simultaneously made up of rotations selected from the "Master Sample" and the National Dwelling File. From the fourth quarter of 2014 onwards, all rotations in the sample of the Labour Force Survey will be made up of dwellings selected from the National Dwelling File.

7. Note that the Labour Force Survey levels will be based on samples exclusively from the 2011 Census only in the fourth quarter of 2014. Thus, quarterly changes in the first quarter of 2015 and year-on-year changes in the fourth quarter of 2015 will be the first to be calculated only with the new sampling basis.

8. This common sample is regularly used by Banco de Portugal for the analysis of flows between the different labour market status (employment, unemployment and inactivity) and uses the population weights of the most recent quarter.

9. Note that the individuals participating in these professional internships are classified as being employed for the purpose of the Social Security contributory scheme and should also be considered in employment in Labour Force Survey replies.

10. Net lending is calculated on the basis of the transactions concept used in balance sheet statistics, i.e., new borrowing less repayment of loans, adjusted for the impact of sales and loan securitisation. The pre-defined benchmark takes into account net lending to non-financial corporations and households (excluding loans to households for house purchase) in the twelve-month period ended on 30 April 2014. Where net lending during that period was nil or positive, the benchmark is zero. Where net lending in that period is negative, different benchmarks will be applied, calculated in accordance with the following rule: the average monthly amount of net lending granted in the year ended on 30 April 2014 is extrapolated for 12 months until 30 April 2015; subsequently, for the period between 30 April 2015 and 30 April 2016, it is fixed at the benchmark as at 30 April 2015.

11. Additionally, if for a specific counterparty, net lending to non-financial corporations and households (excluding loans to households for house purchase) between 1 May 2014 and 30 April 2016 is higher than the benchmark, but the cumulative amount of borrowings in TLTROS between March 2015 and June 2016 is higher than the maximum borrowing allowed on the date of the last operation of June 2016 (that would result from the application on this date of the rule described above), that counterparty must also pay back that difference in September 2016.

12. The Covered Bonds Purchase Programme 3 (CBPP3) means that this is the third version of this type of purchase programme.

13. In particular, the Ministry of Finance classifies as temporary the recording as capital transfer of the *STCP* and *Carris* debt stock, related to the respective financial restructuring processes (0.7 per cent of GDP), expenditure on severance payments within the scope of the Mutual Agreement Separation Programme (0.2 per cent of GDP), the cost of the extraordinary tax credit on investment (0.1 per cent of GDP) and the write-off of non-performing loans in the balance sheet of BPN Crédito, held by Parvalorem (0.1 per cent of GDP). Only the reclassification of transport companies' debt and the BPN Crédito's operation, which do not directly result from Government's discretionary decisions, are in line with the Eurosystem's definition of temporary measures.

14. The comparison of the targets must take into account that the estimate in the 2015 SB is in line with the new European System of Accounts (ESA2010), whereas the FSD goals had the previous methodological framework (ESA1995) as reference. However, the impact of the methodological change in the 2014 and 2015 deficit estimates as a ratio to GDP is expected to be limited.

15. Portugal is under an excessive deficit procedure since 2009, with the deadline for its correction initially set at 2013. This deadline was later revised by the Council of the European Union and set at 2015.

16. There was a revision of the set of measures presented in the FSD, whose net impact on the fiscal balance was estimated to stand at 0.8 per cent of GDP. In particular, following a decision of the Constitutional Court (Decision No 575 from 14 August), the replacement of the Extraordinary Solidarity Contribution (in force until 2014) by the Sustainability Contribution is no longer foreseen for 2015. Moreover, in light of the wage policy changes that took place throughout 2014, the quantification of the effect of the 20 per cent reversal of the civil servants' wage cut was reassessed in the 2015 SB. Finally, the increases in the VAT standard rate and in the contribution of employees to the social security systems foreseen in the FSD were also excluded from the 2015 SB.

17. In this regard, in its Autumn Economic Forecasts the European Commission estimated the Portuguese general government deficit to stand above the official target in 2015, at 3.3 per cent of GDP, and that the excessive deficit will only be corrected in the following year. Also as regards the estimate for fiscal consolidation in 2015, the European Commission's forecasts are more pessimistic than those presented in the SB. In particular, the Commission foresees a 0.4 p.p. of GDP worsening of the structural deficit in 2015.





ARTICLES

The dynamics and contrast of house prices in Portugal and Spain

Sovereign debt crises

Wage adjustments during a severe economic downturn

The Dynamics and Contrast of House Prices in Portugal and Spain¹

Rita Fradique Lourenço and Paulo M. M. Rodrigues²

ABSTRACT

Following the accession to the European Union (EU) in the eighties, the housing market has evolved very differently in Portugal and Spain. This article provides evidence on these differences and tries to explain the behaviour of house prices in both cases. For this purpose, we analyze the evolution of house prices using three different approaches: (1) a comparative analysis of the evolution of the price-to-rent and priceto-income ratios; (2) an assessment of the determinants of house prices based on a Error Correction Model; and (3) an analysis of the existence of speculative bubbles in the Portuguese and Spanish housing markets, using an econometric methodology based on the arbitrage-free model. These three approaches allow us to draw some conclusions regarding the dynamics and contrast of house prices in Portugal and Spain.

Introduction

Spain and Portugal joined the EU in 1986 and both made the process of convergence to the single currency in 1999. It was in this context that for two decades, until the beginning of the financial crisis in 2007, house prices grew on average less than 1 per cent per year in real terms in Portugal and above 6 per cent in Spain (Chart 1). Developments in Spain were quite heterogeneous as compared to Portugal.³ Between 1985 and 1998 house prices rose about 1 per cent a year in Portugal and 5 per cent in Spain. Between 1999 and 2006 house prices registered a zero annual growth in Portugal, having increased almost 10 per cent per year in Spain. Since 2007 house prices fell about 1 per cent per year in Portugal and 6 per cent in the Spanish case.

Developments in the housing market may have major implications on economic activity, particularly through the credit channel and the impact of housing wealth on consumption.⁴ It is therefore



Sources: OECD and Banco de Portugal.

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important to analyze the relationship between business cycles and house prices. In the period between 1970 and 2013 it appears that house-price and business cycles turning points roughly coincide in Spain and Portugal (Chart 2). These results using the Hodrick-Prescott filter, are in line with the dating of the economic cycle performed by the Economic Cycle Research Institute for the Spanish economy.⁵ The contemporaneous correlation between economic cycles and house prices is stronger in Portugal (52 per cent) than in Spain (40 per cent).

With respect to the degree of synchronization of changes in house prices between countries, this is an issue that is more difficult to handle owing to the segmentation in housing markets (significant differences in market dimensions, regulation and taxation, competition, rental market developments, social housing as well as demographic aspects affect housing demand). Thus, to characterize and understand the different evolution of the housing markets in both economies it is useful to analyze a broad range of indicators that are common to the two countries.

Overview of the housing market in Spain and Portugal

When analyzing the evolution of residential investment in Portugal and Spain we found that the biggest difference between the two economies was mainly from the late nineties onwards, when residential investment rose sharply in Spain in the context of low interest rates and significant flows of immigration.⁶ The impact of immigration flows in Spain resulted in a significant increase in the active population at the beginning of the XXI century (Chart 3), and contributed to an increase in housing demand. Between 1999 and 2006 the Spanish residential investment grew at an average annual rate of about 12 per cent, which compares with a GDP growth of 4 per cent (Chart 4). Turning to Portugal, residential investment, which in previous years had increased in line with GDP growth, between 1999 and 2006 saw a contraction of 3 per cent on average per year compared to a GDP growth of about 1.5 per cent during the same period.



Chart 2 • Housing cycles and business cycles

Sources: OECD, Banco de Portugal and authors' calculations.

Data on the number of permits issued for residential new dwellings and business confidence in this sector are consistent with the differential evolution between the two countries from the late nineties to 2006 (Charts 5 and 6). It is notable that although the economic sentiment is similar in both countries the business confidence in the residential construction sector is very different. Between 1997 and 2007 confidence in Spain is clearly superior to that in Portugal probably reflecting some difficulties in the sector in Portugal. The number of permits issued for residential new dwellings in Spain increased sharply between 2000 and 2006, coinciding with the sizeable influx of immigrants, contrary to Portugal where the number of permits has been decreasing since the late nineties.

From 2007 onwards there was a sharp contraction in residential investment in Spain which compares to a less marked evolution of GDP. In Portugal residential investment had already been



Sources: OECD and Banco de Portugal.



Chart 4 • Evolution of residential GFCF and Gross Domestic Product in real terms | Index 1995=100

Sources: OECD, ECB and Banco de Portugal.

declining since the end of the 90's. Between 2007 and 2013, residential investment fell at an annual average rate of about 12 per cent in Portugal and 15 per cent in Spain, compared with a fall below 1 per cent of GDP in both economies. In terms of residential investment as GDP percentage we see that in the Spanish case there was a significant increase from 8 percentage points at the end of the nineties to 13 per cent in 2006. In contrast, in Portugal residential investment represented 5 per cent of GDP in 2006, about 3 percentage points lower than in 1999.

To determine whether the expansion of residential investment that occurred between the end of the nineties and 2006 may have originated an "housing overhang" it is necessary to look at an extended period of time, since an excess supply of housing does not occur in one or two years of high rates of growth in this sector. One possibility to determine the excess of houses available is to calculate the difference between the value of current residential GFCF and the previous 20 years average (both as a percentage of GDP), and accumulate the difference over the period 2000-2006.



Sources: Banco de España and Banco de Portugal.

Chart 6 • Confidence indicators



Economic sentiment

2014

Business confidence in the residential construction sector

Source: European Commission.



Another indicator that allows us to draw some conclusions in terms of the housing market by country is the price in euros per square metre (m²) of housing. The comparability between countries is difficult given the differences in data sources and sample size, e.g. for Portugal data is only available since after the crisis. In the Portuguese case the price per m² is obtained from bank appraisals which are collected through a monthly survey, gathering information on homes that are object of bank financing, and where there is a technical evaluation of each property. In Spain the price per m² is obtained through real estate evaluations made by companies specialized in this area.⁷

The data indicate that between 1999 and 2007 prices per m² increased by about 170 per cent in Spain, with Andalucia and Comunidad Valenciana the regions with greater increases, followed by Madrid (Chart 8). The regions with smallest increases were Castilla y León and Galicia. Since 2008 prices per m² fell about 29 per cent in Spain, with a slightly larger correction in regions that had risen most (32 per cent). In Portugal the price per m² fell by about 12 per cent since 2008, ranging from a low of 9 per cent in the North and a maximum of 21 per cent in the Algarve and Madeira. Lisbon recorded a 16 per cent drop.

Finally, given its relevance for the housing sector and the impact it may have on the cost of financing it is also important to analyze credit in detail. Data on bank lending indicate the existence of episodes of very high growth in mortgage loans between the mid-1990s and 2006 (Chart 9). This annual growth was about 16 per cent on average in Portugal and in Spain, in the context of de-



Sources: OECD, ECB, Banco de Portugal and authors' calculations.



clining costs of bank loans and high and sustained growth in household disposable income, which was reflected in an increase of indebtedness of such families. Within a decade the indebtedness of Portuguese and Spanish families, measured as mortgage loans in terms of disposable income, rose from about 25 per cent to over 90 per cent in 2006. The significant deceleration of credit to housing from 2007 onwards should be seen in the context of the international financial crisis which had a negative impact on the supply, given a significant tightening in lending conditions, and on housing credit demand.

House prices, macroeconomic fundamentals and speculative bubbles

After this general characterization of the housing markets in Portugal and Spain we will evaluate the relationship between house prices and macroeconomic fundamentals. The idea is to determine



whether in the period under analysis prices were overvalued at some point. Based on the evolution presented above it is possible that Spain may have faced a period of exuberance from the late 90s to 2006, resulting from a strong demand given *inter alia* the flow of immigration.

To answer this question we use three approaches: (1) a comparative analysis of the evolution of house prices and rents and house prices and income; (2) an assessment of the importance of some macroeconomic determinants for the evolution of house prices (interest rates, disposable income and labour force); and (3) the application of a test specifically designed for the detection of bubbles proposed by Philips, Shi and Yu (2013).

Comparative analysis of the evolution of price-to-rent and price-to-income ratios

Asset pricing theory predicts a clear relation between house prices, rents, and discount rates based on arbitrage opportunities between buying and renting real estate. Thus, the price-to-rent ratio captures the long-term relationship between the cost of owning a house and the return on renting it out.⁸ In other words, when house prices are very high compared to rents, potential buyers find it more advantageous to rent than to buy, leading to a reduction in demand for real estate, which in turn will exert downward pressure on house prices. The reasoning is the opposite when the ratio between house prices and rents is very low, in this case it is better to buy a home than to rent. If by any chance the price-to-rent ratio remains high for a very long period of time, it can be argued that house prices are being supported by unrealistic expectations of future earnings from the sale of housing and not the true value (or fundamental) of rents. In this sense, there may be conditions in which there is a "bubble" / overvaluation of house prices.

Another conventional measure used in assessing the dynamics of house prices is the price-toincome ratio. In this case, we compare the total cost of a home relative to median annual income, measuring whether or not housing is within reach of the average buyer. This indicator captures the notion that in the long run house prices are limited by the families' capacity to bear the burden of the real estate purchase, including service of the debt incurred for the house purchase from the stream of income. If the ratio is above the long-term level this means that potential buyers do not have available funds to purchase real estate, leading to a reduction in demand, which in turn exerts a downward pressure on prices.

Table 1 shows the long-term averages of the price-to-rent and price-to-income ratios for Portugal, Spain and other countries (column 1), the latest values observed (column 2) and the relationship between the two (column 3). Chart 10 shows the cyclical deviations from the medium and long-term trends. Column (3) indicates that, in most countries, including Portugal and Spain, house prices are currently in line with long-term averages. This is a very different situation from what happened in the period between 1999 and 2006, in particular for Spain. At that time, the deviations from the long-term average in Spain exceeded 50 per cent, which may suggest the existence of overvaluation of house prices in the Spanish case. In Portugal deviations were always in line with long-term values.

	Price-to-rent ratio		Price-to-income ratio			
	Average (1)	Last quarter (2)	(3)=(2)/(1)x100	Average (1)	Last quarter (2)	(3)=(2)/(1)×100
Austria	100	115	116	99	120	121
Belgium	65	102	156	69	101	146
Finland	74	100	134	98	97	99
France	75	97	129	78	99	127
Germany	126	118	93	130	114	88
Greece	96	81	84	94	85	90
Ireland	76	76	100	86	82	95
Italy	92	86	93	84	89	106
Netherlands	74	77	105	71	82	116
Portugal	103	86	84	105	101	96
Spain	74	77	105	74	80	108
UK	73	103	141	83	105	127
US	98	103	105	110	99	90

Table 1 • Price-to-rent ratio and price-to-income ratio

Source: OECD.

Note: Average considering available information since 1980. Last observation 2nd quarter 2014. 2010=100.

It should be noted that there are some caveats in using these conventional metrics. It is possible that in some occasions these measures may, however, fail to reflect accurately the state of housing costs and indicate that house markets can appear exuberant when house prices are in fact reasonably priced. According Himmelberg *et al.* (2005) the price of a dwelling corresponds to the annual cost of owning, so rising house prices does not necessarily indicate that ownership is becoming more expensive or that housing is overvalued. It is also possible that there is significant variability in the price-to-rent ratios across markets, given the differences in expected appreciation rates of houses and taxes, and also depending on rental markets being liquid or not. Note that in Portugal the rental market is relatively underdeveloped in the period. Finally, Himmelberg *et al.* (2005) also reported that the sensitivity of house prices to fundamentals is greater when real long-term interest rates are already very low (as has been observed since the late nineties), so that an acceleration in house price growth may not mean that there is a bubble.

The fundamentals of house prices

To analyze which fundamentals are relevant in determining the dynamics of house prices (hp_t) , we estimated for Portugal and Spain several error correction models. Given the sample size, we opted for regressions that considered only real disposable income (y_t) , the interest rate (r_t) and labour force (l_t) . The models considered were estimated for the entire sample period, as well as for pre and post-crisis periods, in order to verify which relevant determinants in the pre-crisis period remained significant in the post-crisis period.

The estimated error correction model was the following,

$$\Delta h p_t = c + \sum_{i=1}^2 \alpha_i \Delta h p_{t-i} + \sum_{i=0}^2 (\beta_i r_i + \delta_i \Delta y_{t-i} + \vartheta_i \Delta l_{t-i}) + \gamma \left(h p_{t-1} - \widehat{h p}_{t-1}^* \right) + u_t \tag{1}$$

Articles

where $\widehat{hp_t^*} = \widehat{a} + \widehat{\varphi}_1 y_t + \widehat{\varphi}_2 l_t$, Δhp_t , Δy_t , and Δl_t represent the first differences of hp_t , y_t and l_t ; and u_t are identically and independently distributed errors with zero mean and constant variance.

The variables considered are those that have a direct impact on housing demand: the interest rate (r_t), the logarithm of disposable income (y_t), time lags of house prices ($\Delta h p_{t-i}$), the logarithm of labour (l_t) and the error correction term $(hp_{t-1} - hp_{t-1}^*)$, (the deviations from the long-term equilibrium). The error correction term ensures that house prices are, in the long-run, in line with the economic fundamentals that determine the equilibrium level.

The short term part of the model , *i.e.*, $\Delta h p_{t-i}$, i=1,2, captures, among other things, influences on the speculative market or market inefficiency⁹, γ measures the degree of mean reversion and the parameters β_i , $\delta_i e \ \vartheta_i$, i = 0, measure the contemporaneous adjustment of house prices to shocks in the explanatory variables , *i.e.*, correspond to the impact multipliers. The deviations from the long-run equilibrium are indicative of over or undervaluation of house prices. Thus, if $(hp_t - hp_t^*) > 0$ it means that house prices are overvalued and if $(hp_t - hp_t^*) < 0$ it means that house prices are undervalued relatively to the determinants. Several variants of the error correction model considered in (1) are often used in the literature as representative of house prices; e.g., Barot and Yang (2012), Hort (1998), Malpezzi (1999), Gallin (2006), Hadjimatheou Giussani (1992) and Jones and Holly (1997).



The estimation of the long-term relationship considers that variables are integrated of at most order 1, *i.e.*, non-stationary. Applying the augmented Dickey-Fuller test to the three determinants considered and to house prices, it appears that with the exception of the interest rate (r_i), the null hypothesis of non-stationarity is not rejected for any of the other series. Thus, the long-term relationship for house prices will be established only with disposable income and labour.

The estimation of the error correction model proceeds in two steps: first, we estimate the long-term relationship (in levels) using ordinary least squares; and second, the residuals resulting from the long-term model estimated in the first step are included in regression (1) as the error correction term, and this model is also estimated by ordinary least squares.

The estimation results for model (1) following a general to specific approach for Portugal, for the three periods considered, are presented in table 2 and for Spain in table 3.

	1988:02-2014:02 Coef.	1988:02-2007:02 Coef.	2007:02-2014:02 Coef.
С	-0.0018*	-0.0030*	-0.0014
Δy_t	0.1527*	0.3263***	
\mathcal{F}_{t}	0.0018*		
$\left(hp_{t-1} - \widehat{hp}_{t-1}^*\right)$	-0.0408**	-0.0256	-0.2178**
Δl_{t-1}	0.6131***	0.6850**	
r_{t-1}	-0.0015		
$\Delta h p_{_{t-1}}$	0.4786***	0.4849***	0.5048***
R-squared	0.4940	0.4955	0.4865
Adj. R-squared	0.4627	0.4671	0.4438

Table 2 • Error correction models for Portugal

Sources: OECD, ECB, Banco de Portugal and authors' calculations.

Note: *, ** and *** indicates statistical significance at 1 per cent, 5 per cent and 10 per cent, respectively and Coef indicates coefficients.

From table 2 it appears that in the context of the period under analysis (1988Q2-2014Q2), contemporaneous income and interest rates are significant, but the interest rate has a relatively low short-term impact (0.0018). Regarding labour, ΔI_{t-1} is statistically significant, but there is no contemporaneous effect.

The decomposition of the sample in the pre- and post-crisis subsamples illustrates a different causality relationship. In the pre-crisis period only income and the lagged labour force are significant, and both variables have positive impact on prices. However, after 2007 this significance disappears, suggesting that the dynamics of house prices in this period may have been caused by different factors than those considered in our model (disposable income, interest rate and labour).

The graphical representation of the deviations from the long-run equilibrium, $(hp_{t-1} - hp_{t-1}^*)$, shows that between 1989 and 1994, and 1999 and 2005 in Portugal there were slight positive deviations (Chart 11). These periods with positive deviations, indicative of possible overvaluation of house prices are in accordance with the cycle of prices observed for Portugal (Chart 2), *i.e.*, correspond to periods of some market heating, however the deviations are too small to be considered periods of exuberance.



	1977:02-2013:04 Coef.	1977:02-2007:02 Coef.	2007:02-2013:04 Coef.
С	-0.0011	-0.0006	-0.0156***
Δl_t	-0.9139*	-0.9771*	
Δy_t	0.7338***	0.7754***	0.6064***
$\left(hp_{t-1} - \widehat{hp}_{t-1}^*\right)$	-0.0353***	-0.0350***	-0.0769*
Δl_{t-1}	0.9793**	1.0203*	
Δy_{t-1}	-0.3822**	-0.4595**	
r_{t-1}	-0.0017**	-0.0016**	
$\Delta hp_{_{t-1}}$	0.5572***	0.5598***	
Δy_{t-2}	0.2468*	0.3528*	
r_{t-2}	0.0013*	0.0013*	
$\Delta h p_{t-2}$	0.2384***	0.2023**	
R-squared	0.6910	0.6565	0.5080
Adj. R-squared	0.6683	0.6253	0.4652

 Table 3 • Error correction models for Spain

Sources: OECD, ECB, Banco de Portugal and authors' calculations.

Note: *, ** and *** indicates statistical significance at 1 per cent, 5 per cent and 10 per cent, respectively and Coef indicates coefficients.



The graphical representation of the deviations from the long – term, $(hp_{t-1} - hp_{t-1})$, in Spain allows us to identify three periods of overvaluation, 1977-1980, 1986-1995, and 2003-2008 (Chart 12). Furthermore, as expected, the deviations coincide with the evolution of the cycle of house prices in Spain. However, and in contrast to Portugal, it appears that the magnitude of these deviations is considerably larger, meaning that in this case the overestimation may be associated with episodes of exuberance.

Existence of speculative bubbles in house prices

To complement the previous analysis, we applied a method for the detection of bubbles recently proposed by Phillips, Shi and Yu (2013). This approach is based on a General Arbitrage-Free Model and allows for the detection of periods that may be associated with speculative bubbles. House prices, based on this theory, can be explained by two components: market fundamentals and



Sources: OECD, Banco de Portugal and authors' calculations.

speculative bubbles. The latter typically originates explosive behaviour in prices which temporarily dominate the behaviour of the time series. The procedure proposed by Phillips, Shi and Yu (2013) aims to detect these episodes of exuberance in the series.

The application of the test of Phillips, Shi and Yu (2013) to the log of real house prices indicates that there are no periods of exuberance for Portugal, but detects the existence of bubbles in Spain. For Portugal, the test value was 0.1445, not rejecting the null hypothesis of no speculative bubbles. In contrast, for Spain the result of the test was 3.7537, thus rejecting the null hypothesis at a significance level of 1per cent (strong rejection).

The rejection of the null hypothesis in the case of Spain calls for the graphical representation of the results of the recursive test by Phillips *et al.* (2013). This graphical representation is useful because it allows us to determine the periods when speculative bubbles occurred (Chart 13). According to this chart, it can be seen that the rejection of the test by Phillips *et al.* (2013) indicates a speculative bubble in Spain between 2000 and 2006.

Conclusions

Following the accession to EU in the eighties, the housing market has evolved very differently in Portugal and Spain. In particular, between the adoption of the single currency in 1999 and the beginning of the financial crisis, house prices saw a zero annual growth in Portugal and on the contrary increased by almost 10 per cent per year in Spain. During this period, both economies registered a remarkable increase in bank lending for house purchase in a common framework of sustained growth in household disposable income and low interest rates, and a significant influx of immigration, in the Spanish case. In this period, residential investment has evolved differently in the two countries. In Spain there was a significant expansion in residential investment since 2000, well above the GDP dynamics. An indicator of housing overhang suggests an "excess" of about 30 per cent of houses in Spain in 2006. From 2007 onwards there was a sharp contraction in residential investment in Spain, which is distinguished from the less marked evolution to GDP. In Portugal, residential investment has been slowing down since the end of the 90's. The estimation of error correction models for Portugal and Spain confirms that real disposable income, labour and real interest rates are relevant in determining the dynamics of house prices. The analysis indicates that the periods of positive deviations from the long-term agree with the cycle of the prices observed in Portugal and Spain. This overvaluation of house prices (positive deviations), depending on its magnitude, may suggest the formation of speculative bubbles. To test for bubbles we applied the test proposed by Philips et al. (2013) to the Portuguese and Spanish housing markets. The results show that there are no periods of exuberance in Portugal, however they point to the existence of a bubble in Spain in the period before the financial crisis of 2007.

References

Barot, B. and Z. **Yang**, 2002, "House prices and housing investment in Sweden and the UK: Econometric analysis for the period 1970-1998", *Review of Urban & Regional Development Studies*, 14(2), 189-216.

Case, K. E., J.M. Quigley and R. J. Shiller, 2005, "Comparing Wealth Effects: The Stock Market *versus* the Housing Market", *Advances in Macroeconomics,* Volume 5, Issue 1, Article 1.

Englund, P., M. Hwang and J. M. Quigley, 2002, "Hedging Housing Risk", *Journal of Real Estate Finance and Economics*, 24, 167-200.

Gallin, Joshua, 2006, "The Long-Run Relationship between House Prices and Income: Evi51

dence from Local Housing Markets", *Real Estate Economics*, 34 (3), 417-438.

Giussani, B. and G. Hadjimatheou, 1992, "House prices: An econometric model for the U.K. Netherlands", *Journal of Housing and the Built Environment*, 7, 31-58.

Gros, D., 2007, "Bubbles in Real Estate? A Longer-Term Comparative Analysis of Housing Prices in Europe and the US", *CEPS Working Document*, No 276 / October 2007.

Himmelberg, C., C. Mayer and T. Sinnai, 2005 "Assessing High House Prices: Bubbles, Fundamentals and and Misperceptions", *Journal of Economic Perspectives*, Volume 19, Number 4, Fall 2005, 67-92.

Holly, S. and N. Jones, 1997, "House prices since the 1940s: Cointegration, demography and asymmetries", *Economic Modelling*, 14, 549-565. Hort, K., 1998, "The Determinants of Urban House Price Fluctuations in Sweden, 1968-1994", *Journal of Housing Economics*, 7, 99-130.

Homm, U. and J. Breitung, 2012, "Testing for Speculative Bubbles in Stock Markets: A Comparison of Alternative Methods", *Journal of Financial Econometrics*, 10, 198-231.

Malpezzi, S., 1999, "A Simple Error-Correction Model of House Prices", *Journal of Housing Economics*, 8, 27-62.

Phillips, P. C. B., S. P. Shi and J. Yu, 2013, "Testing for multiple bubbles: Historical Episodes of Exuberance and Collapse in the S&P500", *Cowles Foundation Discussion Paper*, No. 1914 FIRN Research Paper.

Notes

1. The authors thank Raúl Guerreiro for his help in the extraction of the cycles mentioned in the article and Nuno Alves for helpful comments and suggestions. The opinions expressed in this article are those of the authors and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.

2. Banco de Portugal, Economics and Research Department.

3. Since 1988 in the case of Portugal.

4. Research shows that homes are the major assets in households portfolio (Englund *et al.* 2002) and that changes in housing-wealth can lead to changes in homeowners' consumption (Case, Quigley and Shiller, 2005).

5. The ECRI has no dating of the economic cycle for Portugal. However, the definition of two consecutive quarters of falling GDP to indicate the trough is also in line with these results.

6. According to the census data between 2000 and 2006 the population of Spain increased by nearly 4 million to over 44 million people, 3.2 million of whom were foreigners between 15 and 64 years (80 per cent). The Ley Orgánica 4/2000 of inmigración y Extranjería that enshrined the right of free access to public services like education and health may have played a part in increasing the flow of immigrants since 2000. In 2013 the number of foreigners in Spain was about 5.5 million to a total population of 47 million.

7. Asociación de Análisis del Valor and Asociación de Sociedades de Valoración de Bienes Inmuebles.

8. It is the equivalent in real estate markets of the price to earnings ratio (PER), the most common measure of the cost of a stock.

9. The two lags considered were necessary to ensure the absence of autocorrelation in the residuals.



Sovereign Debt Crises¹

Pedro Teles²

ABSTRACT

Sovereign debt crises can be triggered by high default probabilities induced by high interest rates. This is more likely if debt is relatively large. In this context, the intervention of a large lender with deep pockets, such as the European Central Bank (ECB), can help coordinate on low interest rates. The article is based on the work of Navarro, Nicolini and Teles (2014).

Introduction

The European debt crisis has motivated new research on the origins of sovereign debt crises. Are crises caused by fundamentals, alone, or is it the case that beliefs play an important role? The answer to this question is crucial in justifying policies such as the massive debt purchases announced by the ECB, back in the Summer of 2012. Those Outright Monetary Purchases (OMTs) were not undertaken, but they are still overwhelmingly credited for the drop in sovereign debt spreads that followed.

Spreads on sovereign bonds, that were nonexistent since the introduction of the Euro until the end of 2009, were by the Summer of 2012 higher than 5 per cent for Spain and Italy, and 11 per cent for Portugal. After the announcement of debt purchases by the ECB in July of 2012, they came down to the current levels of 1.5 to 2 per cent. These were countries that had very fast, and massive, accumulation of sovereign debt. In that, they were not alone. Average debt accumulation for advanced economies, between 2008 and 2011, was 25 per cent of GDP. For Portugal, sovereign debt as a share of GDP went up from 72 per cent in 2008 to 108 per cent in 2011. The corresponding figures for Spain and Italy were 40 per cent to 70 per cent, and 106 per cent to 120 per cent, respectively. For Portugal, the unprecedented debt accumulation coincided with a period of stagnation that was more than a decade long. Are the sovereign debt crises in these countries to be explained by these bad fundamentals, or, instead, was it caused, by, equally bad, expectations? Or rather, do both fundamentals and expectations play a role?

The literature on sovereign debt crises is ambiguous on whether equilibria can be driven by expectations alone. In the more standard quantitative model of sovereign debt crises, as in Eaton and Gersovitz (1981), Aguiar and Gopinath (2006) or Arellano (2008), a single equilibrium is computed in which only fundamentals play a role. Instead, in Calvo (1988) and, more recently, Lorenzoni and Werning (2013), there are also high interest rate equilibria that are driven by expectations. Navarro, Nicolini and Teles (2014) argue that the reasons for the different results are the assumptions on the timing of moves of the debtor and creditors and the actions they take. In Aguiar and Gopinath (2006) or Arellano (2008), the debtor moves first and chooses debt at maturity. The debtor faces an interest rate schedule as a function of the choice of debt. By choosing the level of debt at maturity, the debtor determines the probability of default, and hence the interest rate. In Calvo (1988) and Lorenzoni and Werning (2013), the debtor faces a schedule for current debt rather than debt at maturity. For the same level of current debt, if the interest rate is high, so will debt at maturity. If debt at maturity is high, the debtor is more likely to default which confirms the high interest rate. Similarly, if the interest rate is low, the probability of default will also be low, which is consistent with the low interest.



The timing of moves in Navarro *et al.* (2014) has the creditors move first and offer funds at some interest rate. The debtor moves next and chooses the debt level. There is nothing the debtor can do to prevent the creditors from coordinating on high interest rates. Whether the choice of debt is for current debt or debt at maturity does not make a difference. There are multiple equilibria in either case. There are equilibria with low interest rates and low default probabilities, and equilibria in which both interest rates and default probabilities are high.

In Navarro *et al.* (2014), even if the debtor takes the current interest rate as given, the impact of the decisions on aggregate outcomes is still taken into account. The debtor is a large agent, it is just the first mover advantage that is assumed away. That first mover advantage is what permits the coordination on a low interest rate equilibrium in Aguiar and Gopinath (2006) or Arellano (2008).

The reason for expectations-driven, high interest rate equilibria, in these models is different from the one in the model with rollover risk of Cole and Kehoe (2000). Still, one thing these models have in common is that the timing of moves is crucial to generate multiplicity. In Cole and Kehoe, there is multiplicity when the issuance of debt takes place before the decision to default. In that case, it may be individually optimal for the creditors not to roll over the debt, which amounts to charging very high rates. This may induce default, confirming the high interest rates.

It is not clear how direct evidence could be used to assess the alternative timing assumptions, on who moves first, whether debtors or creditors, and on which actions they take. But it is not easy to dismiss the indirect evidence on these assumptions, from the large and abrupt movements in spreads during sovereign debt crises, the recent European crisis being of particular interest.

Focusing on Navarro *et al.* (2014), this article explains how sovereign debt crises can be driven by expectations of high default probabilities that are induced by high interest rates. Those expectationdriven, high interest rate equilibria are more likely for relatively high debt levels. There is a role for a creditor, with deep pockets, that can achieve coordination on the low interest rate equilibrium, at zero cost.

The model

The model is borrowed from Navarro *et al.* (2014). It is of a small open economy populated by a representative agent that lives for two periods. There is a low endowment in period one (normalized to 1) and a random endowment $y \in [1, Y]$ in the second period. y has density f(y) and cumulative distribution F(y). The agent can borrow in a noncontingent bond, but cannot commit to repay. Default is penalized with the lowest endowment in the support of the distribution, 1. There is a continuum of risk neutral foreign creditors that require an average return equal to the risk-free rate.

The timing of moves is as follows. In the first period, each creditor $i \in [0,1]$ offers limited funds at gross interest rate R_i . In equilibrium, $R_i = R$ for all i. The borrower moves next and borrows b from the low rate creditors. In the second period, the borrower decides whether to default fully or to pay the debt in full.

Second period utility is U(y - Rb) if the debt is repaid, or U(1) if there is default. Default occurs whenever the endowment is below the threshold 1 + bR. It follows that F(1 + bR) is the probability of default. In the first period, the borrower chooses debt b to maximize

$$U(1+b) + \beta \left[F(1+bR)U(1) + \int_{1+bR}^{Y} U(y-bR)f(y)dy \right].$$

The solution of this problem defines a demand curve for b as a function of R.

Articles

The other equilibrium condition, defining a supply curve for *b* as a function of *R*, is obtained from the requirement that the average return on the debt that is subject to default, $R\left[1-F\left(1+bR\right)\right]$, be equal to the risk free rate, R^* ,

$$R^* = R \left[1 - F \left(1 + bR \right) \right]. \tag{1}$$

It is useful to represent the supply curve defined in (1). To do this, consider first the function for the expected return on the debt, $h(R;b) = R \left[1 - F(1 + bR)\right]$.

For a very low R, the expected return must be below R^* . In particular, for R = 0, h(0;b) = 0. For R high enough, the debt gross of interest is such that default is very likely, so that for most distributions, the expected return will also be zero. For standard distributions, the function h(R;b) is concave. Chart 1 depicts the curves of the expected return as a function of R, for different levels of b, for the normal distribution. The higher is b, the closer is the curve to x-axis. The horizontal dotted line is the risk free rate. There are two solutions of equation (1) for the interest rate, a low and a high rate. When the level of debt b goes up, the low rate also goes up, but the high rate goes down.

Chart 2 depicts the solutions of the arbitrage condition (1) for the interest rate. There is an increasing schedule, with the interest rate going up with the level of debt, and a decreasing schedule in which strikingly the interest rate goes down with the level of debt. In a sense, along the increasing schedule, default probabilities are high because debt is high, while in the decreasing schedule, default probabilities are high because interest rates are high.

That interest rates go down with the level of debt is not the only surprising feature of the decreasing schedule. As it turns out, the gross service of debt also goes down with the level of debt. This means that along that schedule the borrower can increase the borrowed amount, b, and pay less for it, bR. To see this, notice that from (1), bR is increasing in R. Since R decreases with b, it must be that bR decreases with b.



Chart 1 • Expected return h(R;b)

Source: Author's calculations.

There is one more disturbing feature of the decreasing schedule. Notice that for each point in the area comprised between the two schedules it is possible to find a point on either the decreasing or the increasing schedule with the same interest rate and higher debt, and therefore with higher default probability. This means that profits are positive in that area. If creditors were to jointly deviate from the points on the decreasing schedule and lower interest rates, they would in general be able to increase profits. It also means that there is a big enough coalition of creditors that can do that.³ The role played by the coalition of creditors that can lower rates and make profits could be played by a larger creditor with deeper pockets, such as the IMF or the ECB.

An equilibrium will have to satisfy both the supply curve in chart 2 and a demand curve obtained from the solution of the problem of the optimal debt for the borrower, as depicted in chart 3. As can be seen, there are two intersections, two potential equilibria, one with high interest and relatively low debt. Because of the fragility associated with the decreasing schedule discussed above, the high rate equilibrium can easily be dismissed. However, there are high interest rate equilibria that do not share the same fragility.



Source: Author's calculations.

High interest rate equilibria

The function for the expected return, h(R;b), does not have to be everywhere concave. For a bimodal distribution, with good and bad times, it is not. Suppose the endowment is drawn from one of two independent random variables, y^1 and y^2 , both normal with means μ^1 and μ^2 , and standard deviation σ . The endowment is y^1 or y^2 with some probability. If μ^1 and μ^2 are sufficiently apart, the arbitrage condition (1) has four solutions, as shown in chart 4. The larger is b the more likely it is that there will be more than two solutions, up to the point where there will be again two solutions, and finally none.

Plotting the solutions for R of the arbitrage condition (1), for different debt levels, the supply curve depicted in chart 5 is obtained. There are now two increasing schedules. For relatively high levels of debt, there is a high rate and a low rate that both give zero profits to the creditors, and neither can be easily dismissed.

Chart 6 depicts both the supply and the demand curve, that is discontinuous for the bimodal distribution that was considered.



Source: Author's calculations.

Policy

Consider now that the model also included a large lender that could lend to the borrower, at rate R^P , any amount lower than or equal to a maximum level b^P . If R^P and b^P were the maximum levels of interest rate and debt level along the low increasing schedule of chart 5, then points along the higher increasing schedule up to b^P would not be equilibrium points. Furthermore, since at that rate, and for those debt levels, creditors would be making positive profits, they would compete those profits away and, in equilibrium the amount borrowed from the large lender would be zero.

Multiplicity of equilibria in the literature

Does it matter for multiplicity whether the choice for the borrower is current debt, b, or debt at maturity, a = Rb? Not, in this set up. Instead of writing the supply and demand⁴ conditions from

$$R^* = R \left[1 - F \left(1 + bR \right) \right]$$

and

$$U'(1+b) = R \beta \int_{1+bR}^{Y} U'(y-bR) f(y) dy,$$

those conditions would be written as

$$R^{*} = R\left[1 - F\left(1 + a\right)\right]$$

and

$$U'(1+\frac{a}{R}) = R\beta \int_{1+a}^{Y} U'(y-a)f(y)dy.$$

They are the same two equations with the change of variable a = Rb. The solution must be the same. Indeed, chart 7 depicts those same solutions in R and b, and R and a.

Alternative timing assumptions

The related literature has considered a different timing assumption from the one in Navarro *et al.* (2014), in which the borrower moves first and is offered a schedule of interest rates as a function





of debt levels, *b*, or *a*. In that case whether the schedule is for current debt or debt at maturity matters.

In Aguiar and Gopinath (2006) and Arellano (2008), the schedule is for the interest rate as a function of debt at maturity. Since the borrower is a first mover, that takes the schedule into account, it is able to choose *a* on the low interest rate part of the schedule. Chart 8 depicts the different schedules in *R* and *b*, and *R* and *a*. The dotted part of the increasing schedule in *R* and *a* corresponds to the dotted decreasing schedule in *R* and *b*. The borrower that is offered the single increasing schedule in *R* and *a* will never choose on the dotted part, where debt at maturity is high, and current debt is relatively low.

By choosing *a*, the borrower is able to choose the probability of default, selecting the low probability associated with a low interest rate. Instead, in Calvo (1988) or Lorenzoni and Werning (2013), the borrower is offered either the high rate decreasing schedule in *R* and *b*, or the low rate increasing schedule also in *R* and *b*. Current debt is exogenous, but even if it was not, there would be nothing that the borrower could do to avoid the high rate schedule. Even if the current debt is exogenous, debt at maturity is not. If the borrower was given the right hand schedule in *R* and *a*, it would be able to choose the relatively low *a*, avoiding the high interest rates.

Chart 7 • Current debt versus debt at maturity



Chart 8 • Supply curve for current debt and for debt at maturity



Source: Author's calculations.

Lorenzoni and Werning (2013) use an interesting argument against the ability to choose debt at maturity. They build a game in which the borrower can issue debt in infinitely many subperiods within the period. Crucially there is no within period commitment. The borrower will be competing with the future self, so that in the limit the behavior will be competitive.⁵ This is similar to the timing assumption in Navarro *et al.* (2014) according to which the borrower takes the interest rate as given, and therefore is not able to choose along the schedule.

Concluding remarks

Can a country be trapped in a high interest rate equilibrium, where default probabilities are high because interest rates are high, as first argued by Calvo (1988)? Even if the literature is ambiguous, the answer appears to be yes. Relative to the models that produce a single equilibrium, minor deviations on the timing and actions of agents produce multiple equilibria which have similar features to the multiple equilibria in Calvo (1988).

It is not clear how one can get direct evidence on timing assumptions. But there is indirect evidence in the large and abrupt movements in interest rates, obtained in the model with multiple schedules and a sunspot variable that helps coordinate on the different schedules.

The level of debt plays an important role. In Navarro *et al.* (2014), the high interest rate equilibria that are "expectation-driven" are more likely for relatively high levels of debt. This result can be related to the recent European experience. In fact the sovereign debt crisis in Europe, with large and abrupt movements in spreads, was preceded by a very significant accumulation of debt. The analysis in this article is also consistent with the downward movement in spreads once the intervention policies by the ECB were announced, even if not implemented.

References

Aguiar, M. and G. Gopinath, 2006, "Defaultable debt, Interest Rates and the Current Account", *Journal of International Economics*, 69, 64-83.

Arellano, C., 2008, "Default Risk and Income Fluctuations in Emerging Economies", *American Economic Review*, 98, 690-712.

Calvo, G., 1988, "Servicing the Debt: the Role of Expectations," *American Economic Review*, 78, 647-661.

Cole, H and T. **Kehoe**, 2000, "Self-Fulfilling Debt Crises" *The Review of Economic Studies*, 67, 91-116.

Eaton, J. and M. Gersovitz, 1981, "Debt with Potential Repudiation: theoretical and Empirical Analysis", *Review of Economic Studies*, 48, 289-309.

Lorenzoni, G. and I. Werning, 2013, "Slow Moving Debt Crises", mimeo, MIT.

Navarro, G., J. P. Nicolini and P. Teles, 2014, "Sovereign Default: The Role of Expectations", mimeo, Banco de Portugal and Universidade Católica Portuguesa.

Notes

1. The opinions expressed in this article are those of the author and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the author.

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3. A similar deviation from the increasing schedule would not achieve this. If all creditors were to jointly deviate and increase rates, they would use the monopoly power to increase profits, but an increase in rates by a coalition should not find demand.

4. This, provided the solution of the borrower's problem is interior.

5. The result is similar to the one in the durable good monopoly.

Wage adjustments during a severe economic downturn¹

Fernando Martins² | Pedro Portugal²

ABSTRACT

In this article we present the recent developments of the wage distribution in Portugal. The behaviour of nominal wages reflects the effect of a severe contraction of economic activity which translated, above all, into a marked increase in the proportion of zero nominal wage changes (wage freezes). The consequences of the pentup wage deflation may decisively influence the future development of the Portuguese labour market.

Introduction

The Portuguese labour market has recently been confronted by very severe economic shocks that translated into a dramatic destruction of jobs and into historically high levels of unemployment, thus revealing a weak resilience. The adjustment of the labour demand was exploited in the study of Carneiro, Portugal and Varejão (2014). In this article, we will focus on wage developments, looking in particular to the reaction of nominal and real wages to breaks in economic activity, comparing the wages of newly hired workers with the wages of job stayers.

The bulk of the empirical research that has analysed the behaviour of wages based on microeconomic data has been focused predominantly on ongoing labour relations. In contrast, the rigidity of wages of newly hired workers has received much less attention in the literature.³ This occurs despite the recognized importance of wages of this particular labour force group for job creation and to understand the behaviour of wages over the business cycle (see Pissarides, 2009): the newly hired workers are the workers in the adjustment margin that decisively affect firms' hiring decisions.

An important branch of this research distinguishes the wages of newly hired workers from the wages of job stayers analysing their different behaviour over the business cycle. These studies show that the wages of the newly hired workers are considerably more sensitive to the economic cycle. However, since the number of workers in ongoing jobs is higher than the number of new hires, the aggregate wage becomes invariably more rigid.

These studies have highlighted the idea that the wage response to aggregate labour conditions differs considerably between workers in ongoing jobs and the newly hired workers. Vroman (1977) shows that the patterns of real wage increases for job stayers and job changers are broadly consistent with the theory of the Philips curve formulated by Robert Hall.⁴ Devereux and Hart (2006) and Barlevy (2001) study the wages of job changers and both conclude that their wages are much more sensitive to the cyclical swings than the wages of incumbent workers. Pissarides (2009) provides a survey of these and other empirical micro labour studies and finds that the wages of job changers respond much stronger to unemployment than the wages of workers in ongoing jobs. Carneiro *et al.* (2012) use matched employer-employee data for Portugal in the period from 1986 to 2005 and find that, after controlling for both firm and worker heterogeneity, entry wages are much more procyclical than wages of job stayers.⁵

The main objective of this study is to update the analysis of the cyclical behaviour of entry wages and assess the extent to which firms' internal factors are important for determining the wages of newly hired workers. In particular, we analyse the relative importance of internal and external factors

(such as the wages of workers with similar qualifications and experience or the availability of workers with similar characteristics on the market) for determining entry wages. Bils *et al.* (2014) present evidence that supports the notion that entry wages are partly determined by the wages of stayers. As Blanchard and Summers (1987) point out, if wages are essentially determined by internal factors (such as the internal pay scale or the wages of workers who are in the same job title), this may generate hysteresis in the economy, so that the impact of economic shocks can last longer.

In this context, the relevant theoretical framework of this article is tributary of the well-known insider-outsider theory. This theory emphasizes the idea that established workers (insiders) have most often better employment opportunities than the outsiders. One reason for this to happen is the costs that firms have to bear when they replace insiders by outsiders. These costs include, for example, those related to hiring, firing or training new employees (see Lindbeck and Snower, 2001, Cahuc and Zylberberg, 2004, and Teulings and Hartog, 2008). The specific character of insiders' qualifications and the presence of hiring and firing costs give a comparative advantage to insiders that they can explore to negotiate wages above those that outsiders would be willing to receive, without threatening their job post. The result is that these potential workers may become unemployed involuntarily or have their professional possibilities limited to less desirable jobs.

A number of studies has confronted the insider-outsider theory and the empirical evidence. One of these lines of research has tested the extent to which wages are affected by firms' internal conditions and not only by external conditions (Holmlund, 1991 and Lever 1995 present good summaries of the first studies in this area). Generally, empirical tests are consistent with the hypothesis that both the internal factors and the external factors affect the wages of newly hired workers.

Recent developments in nominal and real wages aggregates

Computing wage aggregates based on the information of the individual records from the *Quadros de Pessoal*, we can see in Charts 1 and 2 that in the latest period nominal wages have maintained a weak growth trajectory (grew 1.1 per cent in 2011 and 0.9 per cent in 2012), while the aggregate



Chart 1 • Behaviour of nominal wages (1986-2012)



Chart 2 • Behaviour of real wages (1986-2012)



Sources: Quadros de Pessoal (1986-2009) and Relatório Único (2010-2012).

real wage has observed a significant drop in the recent economic downturn (-2.9 per cent in 2011 and -1.2 per cent in 2012).⁶

Recent developments in nominal wages reflect a conspicuous increase in the fraction of workers with frozen wages, which in 2012 amounted to nearly four-fifths of workers who remained in the same firm (Charts 3 and 4). In contrast, the fraction of workers who benefited from nominal wage increases declined significantly whereas the proportion of workers whose wages were cut remained at low levels. The latter result is consistent with the institutional framework of wage formation that sets legal (and psychological) barriers to the nominal fall in wages. It is well known that the Portuguese labour market is a remarkable case of nominal wage rigidity (Dickens *et al.*, 2007). It is revealing to note that both the indicator of wage freezes and the indicator of nominal wage increases are significantly influenced by the inflation rate changes and by the unemployment rate. In contrast, the indicator of nominal losses does not seem to respond to changes in the unemployment rate or in the inflation rate (Table 1).

Table 1 • Cyclical sensivity of nominal wage changes: freezes, cuts and increasesOLS estimates

	Nominal Wage Freezes	Nominal Wage Cuts	Nominal Wage Increases
Inflation rate change	-1.993	-0.606	0.915
	(0.700)	(0.700)	(0.136)
Unemployment rate change	0.119	0.007	-0.007
	(0,040)	(0.014)	(0.003)
Number of observations	27,026,518	1,441,018	19,543,112
R ²	0.093	0.003	0.049

Sources: Quadros do Pessoal and Relatório Único (1986-2012).

Note: Wage freezes are defined as a dummy variable that takes the value 1 for those workers whose nominal wages were frozen. Wage cuts and wage increases are defined on the basis of changes in the total amount of base wages. Robust standard errors in parenthesis.



Sources: Quadros de Pessoal (1986-2009) and Relatório Único (2010-2012).

On the cyclical sensitivity of real wages

The indication of strong nominal wage rigidity could lead us to suspect that this rigidity may contaminate the cyclical sensitivity of real wages. In particular, it is well-known that the adjustment of real wages can be problematic in low inflation and low productivity growth regimes, since it may require nominal wage cuts that are unwanted both by workers and employers.

Empirical research on the cyclical behaviour of real wages in Portugal has shown a strong sensitivity of real wages to the economic cycle, especially in the case of wages of newly hired workers (Martins *et al.*, 2012, Carneiro *et al.*, 2012). These conclusions are reinforced when isolating the changes associated with cyclical compositions of the skill levels of employees, types of jobs and firms' remuneration policies.

Extending the analysis of the cyclical behaviour of real wages up to 2012, thus including the period of the Great Recession, it seems that there was no structural break. That is, the recent behaviour of real wages seems aligned with the indication that an increase of one percentage point in the unemployment rate is associated with a fall of 2.1 per cent for job stayers and 2.4 for new workers (Table 2).

	OLS			
	Stayers	New hires		
Unemployment Rate	-0.90	-0.22		
	(0.29)	(0.29)		
Number of observations	42,444,841			
R ²	0.101			
	Worker	fixed effects		
	Stayers	New hires		
Unemployment Rate	-2.09	-0.34		
	(0.21)	(0.04)		
Number of observations	42,444,841			
R ²	().878		
_	First differences			
	Stayers	New hires		
Unemployment Rate	-1.23	-0.71		
	(0.44)	(0.20)		
Number of observations	27,026,518			
	0.014			
_	High-dimensional fixed effects			
	Stayers	New hires		
Unemployment Rate	-2.00	-0.20		
	(0.15)	(0.03)		
Number of observations	42,444,841			
R ²	0.925			

Table 2 • Cyclical sensivity of real wages

Sources: Quadros do Pessoal and Relatório Único (1986-2012).

Note: Dependent variable: log of the CPI-deflated base wage. Additional regressors: age, square of age and a quadratic time trend. Robust standard errors corrected by yearly clusters in parenthesis.

The relative importance of internal and external determinants of entry wages

The distinction between internal and external wages has several implications for the definition of entry wages. First, companies can choose not to negotiate entry wages above the floors set by collective bargaining because of relative fairness or other strategic reasons such as competition or human resources management.

Secondly, recent empirical evidence shows that entry wages are at least partially influenced by the wages of stayers (see, for example, Bils *et al.*, 2014). By negotiating wages above the external options of each newly hired worker, firms reduce the rotation of workers, retaining these workers and reducing the number of separations.

Third, since a significant percentage of firms pay wages above the floors defined by the pay scales (typically sectoral), they can benefit from the so-called "wage cushion" (Cardoso and Portugal, 2005) that results from the difference between the wages actually paid and the wages floors for each job title established by collective bargaining. In the face of an adverse demand or cost shock, these firms are in a more comfortable position to make wage adjustments *vis-à-vis* those firms that pay wages close to the minimum values.

Finally, there is convincing empirical evidence that shows that firms' wage setting policies are clearly heterogeneous. The fact that the heterogeneity in wage policy contributes significantly to the wage change (Torres *et al.*, 2013) is a clear sign that firms in many cases cannot be considered as wage takers. Webber (2013) argues that the labour supply elasticities faced by firms are relatively low, indicating that firms have some monopsony power (Manning, 2003). If, in fact, firms' monopsony power has an important role this should influence the relative importance of internal and external factors in determining starting wages.

In order to better understand the relative importance of internal and external factors in determining entry wages, we will focus this analysis on the behaviour of newly hired workers. The analysis is also confined to cases in which for each newly hired worker there is at least one worker in the same firm, year and job title with a job tenure higher than 12 months.



Sources: Quadros de Pessoal (1986-2009) and Relatório Único (2010-2012).

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In order to separate the internal from the external factors that determine entry wages, for each newly hired worker we calculate an "internal wage" and an "external wage". The latter is simply the modal wage in each year corresponding to the job title of the newly hired worker defined in the context of collective bargaining, while "internal wage" is the mode of the base wage of all workers with a job tenure higher than 12 months in the same year, firm and job title. Chart 5 shows the behaviour of nominal wages. Interestingly to observe the proximity between the entry and the internal wages and, more generally, the comovement of the four series.

The way we measure the relative importance of the internal and external determinants of entry wages is simple but unconventional. Essentially, what we do is to estimate a regression model where the entry wage is regressed on the internal, the external and the minimum wages.



The model coefficients for the three wage variables can be interpreted as measuring the weights assigned by firms to each component in the formation of the entry wage. A question of interest is to evaluate the behaviour of the effect of the minimum wage, the bargained (or market) wage and the internal wage in determining the entry wage. Charts 6, 7 and 8 show that behaviour.

The results show that the internal wage structure of firms is relatively more important for the determination of entry wages: it represents on average about 70 per cent in the determination of entry wages in the period 1982-2012. However, the external and the minimum wages are also important, representing on average, respectively, 21 and 13 per cent of entry wages. More telling is the sharp downward trend of the weight of bargained wages. This development may be associated with the sustained decline of union representation discussed in Portugal and Vilares (2013). On the





Sources: Quadros de Pessoal (1982-2009) and Relatório Único (2010-2012).



other hand, the importance of the minimum wage has increased, especially in recent years, which could mean that the bargained wage increasingly depends on the union power which is guaranteed by the mechanisms of political decision. In general, estimates of the importance of the various components faithfully reflect the presence of workers who are paid according to the minimum wage, the external wage and the internal wage.

Conclusions

The recent behaviour of wages in the Portuguese labour market reflects the consequences of a sharp drop in economic activity and, in this way, the demand for labour. The most remarkable fact of the nominal wage adjustment was the significant increase of zero wage changes. The fact that almost 80 per cent of workers have their wages frozen in 2012 could mean that firms and workers have resisted an adjustment through nominal wage cuts. Workers for obvious reasons. Firms because they realize the devastating effect on the morale of workers triggered by nominal wage cuts. This lack of adjustment, however, may mean that the prospects for future wage increases may be partially compromised by the effect of the so-called "pent-up wage deflation", an effect that has been pointed out in particular by Janet Yellen (2014).

The Portuguese labour market seems to have maintained up to 2012 a behaviour consistent with a significant cyclical sensitivity of real wages. However, it is not guaranteed that, in a climate of very low inflation rates or even deflation, accompanied by low productivity growth, wages will allow additional accommodation margins. In a scenario with these horizons, rising unemployment, again, may be the leading edge of adjustment.

Wage policies of Portuguese firms are very heterogeneous. These policies are differently affected by the minimum wages, by the wages negotiated through collective bargaining and by the internal rates of remuneration. The indication that minimum wages have had a growing influence on the formation of entry wages should be taken with some concern since this could mean that firms are losing autonomy in their wage setting decisions.

Finally, it should be emphasized that the debate on wage adjustment in Portugal has not valued enough the labour costs adjustments that can be made through movements that are not exhausted in of nominal wage cuts. In an environment of low inflation, in particular, it would be important to consider reductions in payroll taxes (reductions in the single social security tax or fiscal credits for earned income) directed mainly to workers with low qualifications.

References

Barvely, G., 2001, "Why are the wages of job changers so procyclical?", *Journal of Labor Economics*, 19(4), 837-78.

Bils, M., Chang, Y. and Kim, S.-B., 2014, "How sticky wages in existing jobs can affect hiring", *NBER Working Papers*, 19821, National Bureau of Economic Research, Inc.

Blanchard, O. J. and Summers, L. H., 1987, "Hysteresis in unemployment", *European Economic Review*, 31(1-2), 288-295.

Cahuc, P. and Zylberberg, A., 2004, "Labor Economics", *Vol.1 of MIT Press Books*, The MIT Press.

Cardoso, A. R. and **Portugal**, P., 2005, "Contractual wages and the wage cushion under different bargaining settings", *Journal of Labor Economics*, 23(4), 875-902.

Carneiro, A., Guimarães, P. and Portugal, P., 2012, "Real Wages and the Business Cycle: Accounting for Worker, Firm, and Job Title Heterogeneity," *American Economic Journal: Macroeco*- *nomics*, American Economic Association, vol. 4(2), 133-52.

Carneiro, A., Portugal, P. and Varejão, J., 2014, "Catastrophic job destruction during the Portuguese economic crisis", *Journal of Macroeconomics*, vol. 39, Part B, 233-460.

Devereux, P. J. and **Hart**, R. A., 2006, "Real wage cyclicality of job stayers, within-company job movers, and between-company job movers", *Industrial and Labor Relations Review*, 60(1), 105-119.

Dickens, W. T., Goette L., Groshen, E. L., Holden, S., Messina, J., Schweitzer, M., Turunen, J. and Ward, M. E., 2007, "How wages change: micro evidence from the International Wage Flexibility Project", *Journal of Economic Perspectives*, American Economic Association, vol. 21(2), 195-214.

Dolado, J. J., Felgueroso, F. and Jimeno, J. F., 1997, "The effects of minimum bargained wages on earnings: evidence from Spain", *European Economic Review*, 41(3-5), 713-721.

Hall, R. E., 1974, "The process of inflation in the labor market", *Brookings Papers on Economic Activity*, 5(2), 343-410.

Holmlund, B., 1991, "Unemployment persistence and insider-outsider forces in wage determination", *OECD Economics Department Working Papers*, 92, OECD Publising.

Lever, M., 1995, "Insider-outsider effects in wage formation: an empirical survey", *Bulletin of Economic Research*, (47:4).

Lindbeck, A. and Snower, D. J., 2001, "Insiders versus outsiders", *Journal of Economic Perspectives*, 15(1), 165-188.

Manning, A., 2003, "Monopsony in motion: Imperfect competition in labour markets", Princeton, N.J: Princeton University Press.

Martins, P. S., Solon, G. and Thomas, J., 2012, "Measuring What Employers Do about Entry Wages over the Business Cycle: A New Approach," *American Economic Journal: Macroeconomics*, American Economic Association, vol. 4(4), 36-55.

Pissarides, C. A., 2009, "The unemployment volatility puzzle: Is wage stickiness the answer?" *Econometrica*, 77(5), 1339-1369.

Portugal, P. and **Vilares**, H., 2013, "Sobre os sindicatos, a sindicalização e o prémio sindical", Banco de Portugal, *Boletim Económico de Inverno*.

Teulings, C. and **Hartog**, J., 2008, "Corporatism or Competition?", *Cambridge Books*, Cambridge University Press.

Torres, S., Portugal, P., Addison, J.T. and Guimarães, P., 2013, "The sources of wage variation: a three-way dimensional fixed effects regression model", Banco de Portugal, *Working papers*, n.º 9, 2013.

Vroman, W., 1977, "Worker upgrading and the business cycle", *Brookings Papers on Economic Activity*, 8(1), 229-252.

Yellen, J., 2014, "Labor Market Dynamics and Monetary Policy", discurso proferido no Federal Reserve Bank of Kansas City Economic Symposium, Jackson Hole, em 22 de agosto.

Webber, D. A., 2013, "Firm market power and the earnings distribution". *IZA Discussion Papers*, 7342, Institute for the Study of Labor (IZA).

Notes

1. The opinions expressed in this article are those of the authors and do not necessarily coincide with those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.

2. Banco de Portugal, Economics and Research Department.

3. Rigidity in this context refers to the absence of deviations between wages of new hires and wages of incumbent workers with similar qualifications.

4. According Hall (1974), movements in the aggregate wage rate are dominated by changes in wage rates paid to newly hired workers.

5. An increase of one per centage point in the unemployment rate decreases the entry wage by 2.7 per cent and by 2.2 per cent the wage of job stayers in the same job title.

6. For consistency reasons and to make the presentation clearer, this analysis will be based on base wages of full-time workers included in *Quadros de Pessoal*. Base wages account for 80 per cent of total wages.

