Economics Bulletin

Volume 40, Issue 3

Determinants of the structure of external funding: the Portuguese case

Jorge Silva
Parliamentary Budget Office, Portuguese Parliament, Lisbon, Portugal

Abstract

This study assesses the structure of the Portuguese international investment position (IIP) between 1999 and 2014. Increasing external imbalances after the introduction of the euro raised concerns on the composition of external funding. Portugal had the most negative IIP among the founding members of the euro area. We estimate the determinants of changes in the categories and instruments of the IIP liabilities. Both external and domestic factors had an effect on the structure of the external funding. External factors were the financial integration in the euro area, financial stress in Europe, the 3-month Euribor interest rate, the exchange rate and the US stock market. The Portuguese 10-year sovereign yield and trade balance were the domestic factors. Regarding policy implications, Portugal should improve the IIP through a combination of different measures. Decreasing debt instruments in favour of equity instruments would be desirable to share risk with foreign investors. A positive current account requires a positive trade balance and secondary income account to offset the negative primary income account.

I thank Professor António Afonso and two anonymous referees for the useful comments. The opinions expressed are those of the author and not necessarily those of his employer.
Citation: Jorge Silva, (2020) "Determinants of the structure of external funding: the Portuguese case", *Economics Bulletin*, Volume 40, Issue 3, pages 2073-2084
Contact: Jorge Silva - jorgefariasilva@gmail.com.
Submitted: April 15, 2020. **Published:** August 08, 2020.

1. Introduction

External accounts play a central role in the adjustment process within the euro area. The economic and monetary union (EMU) has been close to equilibrium in terms of external accounts. However, some countries have had a permanent surplus, while others have lasting deficits. Consequently, there are creditor countries and borrowing ones.

We assess the determinants of the structure of the external funding for the 1999-2014 period in Portugal. During this period, Portugal had the most negative international investment position (IIP) among the founding members of the euro area. This time frame is delimited by structural changes. The introduction of the euro in 1999 meant that monetary policy became an external variable. The year 2014 marked the end of the economic and financial adjustment programme (EFAP), and the beginning of quantitative easing in the euro area.[1] Portugal is a small open economy integrated in the euro area.[2] Given this, it is influenced by both domestic and external variables. Portugal has specific features that emerged during the single currency period: negative current account, high public debt, low economic growth, high public and private external debt, low productivity growth, and the EFAP during the 2011-2014 period. The current account, net external debt and IIP are indicators underlying the external accounts.

The external accounts trajectory is sustainable if the resident institutional sectors can pay interests, rents and profits to non-residents over the medium and long-term, without jeopardising the potential output growth and the external debt rollover. When the IIP is negative (and net external debt is positive) and there is a high amount of debt to rollover, a balanced current account may not be enough to ensure the sustainability of external accounts, because rollover depends on financial integration in the euro area.

Therefore, it is important to know the decomposition of the structure of the external funding. We use quarterly data, which is standard in business cycle analysis. The introduction of the euro was the beginning of a structural change in monetary policy. Consequently, monetary policy variables became external variables. Portugal is an open small economy that is largely impacted by external factors.

Our main findings suggest that the structure of liabilities related to the IIP was particularly impacted by financial integration in the euro area, financial stress in Europe, the 3-month Euribor rate, the US stock market index, the exchange rate, the Portuguese 10-year sovereign yield and trade balance. External funding was based on debt instruments rather than equity instruments, which was a channel of transmission of international financial crisis. These conclusions may be useful to assess external accounts of other small open economies and analyse future monetary and fiscal policy decisions.

The remainder of the paper is organised as follows. Section two presents a literature review. Section three addresses the methodology. Section four details the data. Section five presents the empirical analysis and section six concludes.

---

[1] The EFAP was the agreement between the Portuguese authorities and foreign institutions (the International Monetary Fund, the European Commission and the European Central Bank) during the 2011-2014 period. This programme aimed at supplying financial assistance to general government (budget deficit and reimbursements) and designing structural reforms of economic activity.

[2] During the 1999-2014 period, the Portuguese economy was around 2% of the euro area real GDP and its external debt-to-GDP ratio was the highest among the founding members of the euro area. The deeply negative IIP-to-GDP ratio and the high external debt-to-GDP ratio require openness to external funding and are channels of transmission of external shocks to the Portuguese economy.

2. Literature review

We present here some of the main studies on external imbalances, capital mobility, composition of the IIP and adjustment processes, highlighting the methodologies and results that are most useful to assess the determinants of the structure of external funding.

Faria et al. (2007) studied the determinants of the composition of external liabilities for the 1970–2004 period and 145 countries. The functional categories include mostly equity and debt instruments. Higher domestic financial reform meant a shift toward equity financing. Typically, a higher weight of equity in total external liabilities means that the country can share risk with foreign investors and be resilient to external shocks. The authors concluded that more open economies and better institutional quality meant greater equity share in external liabilities.

Lane and Milesi-Ferretti (2008) assessed the bilateral factors that determined international portfolio equity investments across countries. In the case of the fully integrated world economy, investors would hold identical portfolios. The dataset focused on portfolio equity investment positions at end-2001. The authors concluded that bilateral equity investments were strongly correlated with bilateral trade flows. Additionally, the larger bilateral investment position was a proxy for cultural and physical proximity.

Catão and Milesi-Ferretti (2014) studied the determinants of external crises. They assessed the composition of the foreign liabilities for the 1970-2011 period. The sample included seventy countries (emerging and advanced economies). The authors concluded that the net foreign liabilities-to-GDP ratio was a crisis predictor, in particular when it exceeded some thresholds. Additionally, the composition between instruments was a determinant factor: the net external debt instruments had a stronger effect than the equity instruments. Finally, the size of the current account (negative) affected external crises because it determined the speed at which the net foreign liabilities-to-GDP ratio increased.

Turrini and Zeugner (2019) developed an analysis that aimed at estimating the IIP benchmarks for 65 countries (emerging and advanced economies). The authors estimated two country-specific IIP benchmarks: economic fundamentals and prudential threshold against external crises. The medians were -17% of GDP and -44% of GDP, respectively. Countries should close the gap between the actual IIP and the IIP benchmark. This gap is useful to estimate the required current account.

Afonso et al. (2019) assessed the sustainability of the IIP, external debt and current account for 22 European Union countries. They considered that a trajectory is sustainable if the country is closing the gap between the actual figures and the thresholds implicit in the macroeconomic imbalance procedure.[3] The authors identified which countries had sustainable (unsustainable) positions and flows.

Lane and Milesi-Ferretti (2012) analysed the current account imbalances before the 2009 financial crisis, as well as the external adjustment in advanced economies and emerging markets. Increasing current account imbalances before 2008 were determined by rising oil prices, asset price bubbles, credit booms and easy external funding. The authors considered that the sudden stop induced more rapid adjustment in the case of non-euro countries. The euro area countries had access to the liquidity operations of the European Central Bank (ECB) and official external funding, which limited the need for a faster adjustment.

Chen et al. (2013) studied the financial movements and international trade patterns of the euro area deficit countries, euro area core countries and other countries (China, Central and Eastern Europe, and oil countries). The international trade of the previous decade was beneficial to core euro area countries and other world countries, but it was detrimental to the

[3] The macroeconomic imbalance procedure is a scoreboard for the surveillance, which was introduced by the European Commission. It includes headline indicators and thresholds.

European deficit countries. In financial terms, investors from the rest of the world preferred financial instruments issued by France and Germany. Consequently, external funding of the euro area deficit countries was obtained from the core euro area countries, which allowed for lasting external imbalances.

Hobza and Zeugner (2014) constructed a database of bilateral financial flows and stocks in the euro area from 2001 to 2012. The stylized findings were the following: the current account deficits of the periphery countries before the financial crisis had been funded by the other euro area countries, mainly the surplus countries, the UK and France; the share of debt instruments in the external funding was higher than the share of equity instruments; the euro area surplus countries had other important financial partners beyond the euro deficit countries; the surplus countries withdrew flows from the deficit countries in 2009 and France became the main funding country until the European sovereign debt crisis. Bilateral trade balances were not a proxy for bilateral financial flows.

Regarding the Portuguese case, Reis (2013) assessed the low economic growth rate over the 2000-2012 period. Financial integration in Europe and decreasing interest rates allowed large capital inflows and growth of consumption. There was a misallocation of abundant capital flows. Afonso and Silva (2017) estimated the determinants of the cyclical and non-cyclical components of the current account for the 2001-2014 period. The non-cyclical component was positively affected by the EFAP period and terms of trade, but negatively impacted by financial integration in the euro area.

3. Methodology

We decompose the external funding of the Portuguese economy and assess econometrically the determinants of the variation of the main categories underlying the IIP: direct investment and portfolio investment.

This study focus on the IIP at the end of the period. The structure of external funding can change even in a period of a financial account close to zero. The disaggregation by category is similar between the IIP and financial account. The current and capital account deficit (surplus) requires net borrowing (net lending). Therefore, we know how net borrowing (net lending) is financed (allocated), as well as the changes in the stock of previous liabilities.

We assess the pattern of financing of the Portuguese economy based on the liabilities of the IIP and consider both domestic and external factors. In addition, our focus is on liabilities instead of assets or balances. The model is the following:

$$Y_t^i = \mu_0^i + \mu_1^i \, S_t^{i,domestic} + \mu_2^i R_t^{i,external} + \epsilon_t^i. \qquad (1)$$

The dependent variables (i) are four ratios: portfolio investment as percentage of direct investment; portfolio investment debt as percentage of GDP; direct investment equity as percentage of GDP; and portfolio investment equity as percentage of GDP. For each dependent variable, we consider both domestic $\left(S_t^{i,domestic}\right)$ and external $(R_t^{i,external})$ independent variables. In the case of ordinary least squares, the error term (ϵ_t^i) is uncorrelated with all independent variables, has mean zero and is normally distributed. The dependent variables are ratios that reflect the decisions of economic agents and financial markets. Therefore, these categories and instruments are negotiable and market price is adjusted for changes in yield rates.

Portugal is a small open economy and, consequently, external factors can have an impact on the Portuguese economy, while external factors are not affected by the Portuguese one. Therefore, there was no endogeneity between external and domestic variables.

4. Data

The set of domestic variables was downloaded from Statistics Portugal *(INE)* and *Banco de Portugal (BdP)*. Data from quarterly national accounts was released by *INE*, while financial data from *BdP*. Table I presents the unit root tests. We transform the series to ensure stationary I (0). Additionally, we applied the breakpoint unit root tests. These tests rejected the existence of break when applied to the first differences.

The set of external variables includes the cross border holdings of corporate and government bonds in the euro area (financial integration indicators), the composite indicator of systemic stress (CISS) in the European financial system, the 3-month Euribor rate, the S&P 500 index, the EUR/USD exchange rate and the dummy for the period after the 2009 financial crisis. We consider the nominal exchange rate because the dependent variables are nominal ratios. The real exchange rate would be useful to assess competitiveness (exports, unit labour costs or terms of trade).

The set of domestic variables has the components of the Portuguese IIP, trade balance, the Portuguese 10-year sovereign yield and the dummy for the EFAP period.

5. Empirical analysis

This section presents the disaggregation of the IIP, in particular the main components of the IIP. The categories are the direct investment and portfolio investment, and the instruments are equity and debt. The IIP liabilities are a proxy for external funding of the economy as a whole. Previous literature analysed sets of countries, focusing on the widening imbalances (Lane and Milesi-Ferretti (2012) and Chen et al. (2013)) and the composition of external funding (Faria et al. (2007), Lane and Milesi-Ferretti (2008), and Catão and Milesi-Ferretti (2014)). Here, we estimate the determinants of the structure of the Portuguese IIP, focusing on country specific features.

The IIP can be disaggregated into institutional sectors, instruments, main countries, assets, liabilities and net position. However, we focus on the debt instruments and equity instruments because they are the weightiest components of the Portuguese IIP. In this way, we estimate econometrically the determinants of the evolution of these instruments. Liabilities are at market prices and the q-o-q variation includes both the price effect and the volume effect. This approach is justified because there are independent variables that affect the dependent variable through price and volume.

By instrument, the other investment was the main instrument with the most negative position since the introduction of the euro (Figure 1). The Portuguese IIP is more negative than the benchmark (Turrini and Zeugner (2019)). The portfolio investment reached a minimum during the financial crisis and the direct investment deteriorated slightly. Reserve assets were associated with measures of the Portuguese central bank as well as those of the Eurosystem. Financial derivatives and employee stock options presented residual values.

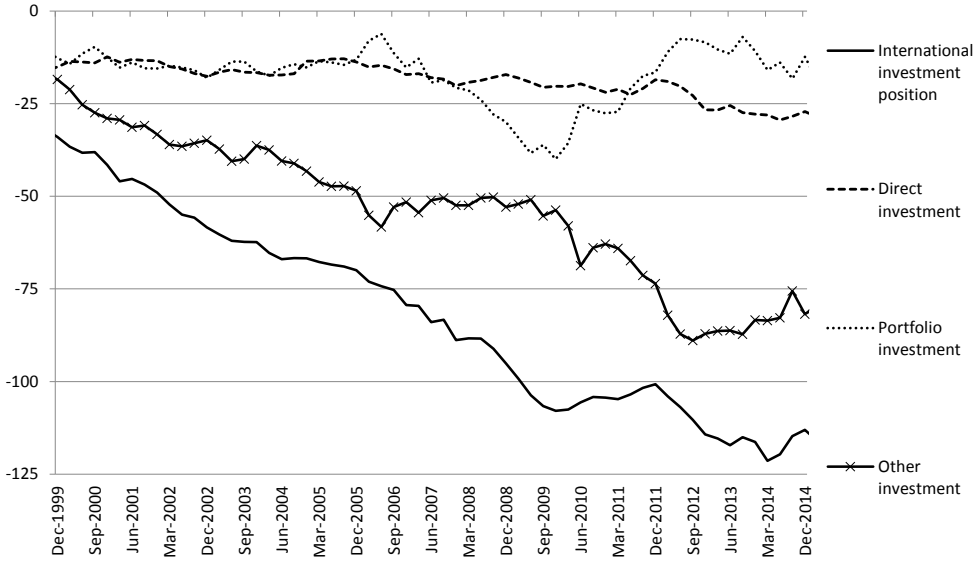
Table I – Data statistics and unit root tests

Variable	Definition	Source	External or domestic variable	Before transformation					After transformation
				Unit	Augmented Dickey Fuller statistics	p-value	KPSS	Unit root I (1)	
Dummy EFAP	Dummy is 1 for the Economic and Financial Adjustment Programme (2011-2014)	-	Domestic	-	-	-	-	-	-
Dummy financial crisis	Dummy is 1 for the period after 2009	-	External	-	-	-	-	-	-
EUR/USD	Exchange rate between Euro currency and US Dollars	ECB	External	US Dollars per Euro	-1.05	0.93	0.21	Yes	q-o-q
Portfolio investment/Direct investment	Ratio between portfolio investment liabilities and direct investment liabilities	BdP and own calculations	Domestic	%	-2.51	0.32	0.20	Yes	Δ
Portfolio investment debt-to-GDP	Ratio between portfolio investment debt (liabilities) and nominal GDP	BdP, INE and own calculations	Domestic	%	-1.73	0.73	0.19	Yes	Δ
Direct investment equity-to-GDP	Ratio between direct investment equity (liabilities) and nominal GDP	BdP, INE and own calculations	Domestic	%	-2.57	0.29	0.16	Yes	Δ
Portfolio investment equity-to-GDP	Ratio between portfolio investment equity (liabilities) and nominal GDP	BdP, INE and own calculations	Domestic	%	-1.20	0.90	0.21	Yes	Δ
IIP balance of the Other investment-to-GDP	Ratio between other investment (balance) and nominal GDP	BdP, INE and own calculations	Domestic	%	-1.99	0.60	0.07	Yes	Δ
Trade balance-to-GDP	Ratio between the balance of goods and services, and nominal GDP	INE and own calculations	Domestic	%	-1.91	0.64	0.19	Yes	Δ
Portuguese sovereign yield 10 years	*Obrigações do Tesouro* (10-year sovereign yield)	BdP	Domestic	%	-2.69	0.24	0.10	Yes	Δ
Degree of openness	Exports plus imports as a share of nominal GDP	INE and own calculations	Domestic	%	-1.99	0.60	0.15	Yes	Δ
Euribor 3 months	3 month Euribor rate	ECB	External	%	-1.69	0.43	0.11	Yes	Δ
CISS	Composite Indicator of Systemic Stress	ECB	External	Index	-2.25	0.46	0.13	Yes	Δ
Cross holdings of government bonds	Financial integration indicator (government debt)	ECB	External	%	-2.79	0.21	0.19	Yes	Δ
Cross holdings of corporate bonds	Financial integration indicator (corporate debt)	ECB	External	%	-2.79	0.21	0.22	Yes	Δ
S&P 500 index	The S&P 500 stock market index	Refinitiv	External	Index	-1.04	0.93	0.16	Yes	q-o-q

Notes: q-o-q means quarter-on-quarter rate of change. Δ means the difference between period *t* and the period *t-1*.

Figure 1 – International investment position - main items by financial instrument

(end-of-period, outstanding amounts as percentage of GDP)



Source: *BdP – Banco de Portugal*, *INE* – Statistics Portugal and own calculations. This figure does not present the functional categories "reserve assets" and "financial derivatives and employee stock options" because they have a small weight in the Portuguese IIP.

Concerning the direct investment, the slight deterioration since 2005 was explained by the position vis-à-vis Spain. In the case of the position vis-à-vis Germany, there was a rebalancing during the EFAP period. The direct investment category included a higher share of equity instruments and a lower share of debt instruments (Figure 2). This category is defined by a high degree of influence on companies and a durable relationship.

Regarding the portfolio investment, the position of Portugal vis-à-vis other countries reached a minimum during the financial crisis. There was a sudden stop and capital outflows (Reis (2013), and Hobza and Zeugner (2014)). The portfolio investment included a higher share of debt instruments and a lower share of equity instruments (Figure 2). The portfolio investment category is defined by a low degree of influence of investors on companies, which is associated with financial markets and unknown investors. The UK was the main lender during the period of analysis.

Additionally, we consider the evolution of the other investment category and its two main contents. Loans include lending from international institutions during the EFAP, i.e. external debt of the public sector, as well as loans between domestic and external financial institutions. Currency and deposits include external debt that the Portuguese central bank borrowed from the ECB and channelled to the other monetary financial institutions (MFIs).

In this study, we focus on liabilities, which are a proxy for external funding as a whole. There are differences between the rating/creditworthiness of the Portuguese liabilities and the Portuguese assets. For that reason, we split the position into assets and liabilities.

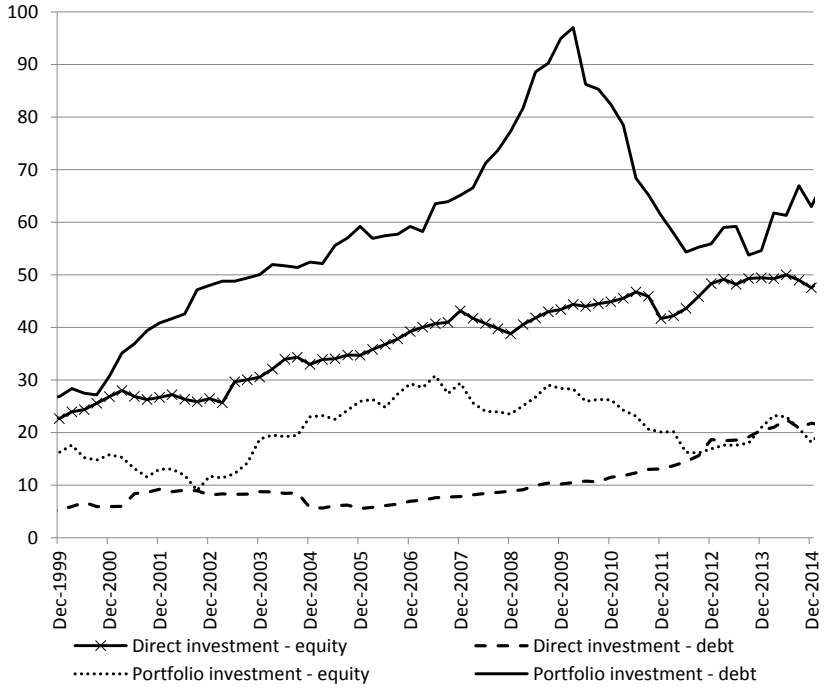
Furthermore, we should keep in mind that the external debt (a subsample of the IIP) is presented at market value. Therefore, during the period of high interest rates in the secondary market, the value of debt was lower. However, the gap between nominal value and market value was higher, and the nominal value is the amount that the borrower has to reimburse at maturity. In this way, the IIP underestimates the amount of nominal external debt.

For a correct approach, we should assess the evolution of all categories, i.e. the variations of the direct investment, portfolio investment and other investment. For example, there was a change from the portfolio investment (debt instrument) to the other investment

debt instrument after 2009. Therefore, the Portuguese central bank borrowed from the ECB to channel external funding to the Portuguese other MFIs.

Considering our focus on liabilities, we split the direct investment and portfolio investment into debt instruments and equity ones (Figure 2). The variations of these instruments are the dependent variables for the econometric estimations. Debt was the largest share of portfolio investment, while equity was the largest share of direct investment. However, we should keep in mind that the direct investment liabilities include two different situations: financial operations concerning the purchase of shares from existing companies through privatisations and acquisitions through the stock market, or real investment with impact on the capital stock, production function and real GDP.

Figure 2 – Decomposition of direct and portfolio investment into equity and debt
(liabilities as percentage of GDP)



Source: *BdP – Banco de Portugal*, *INE* – Statistics Portugal and own calculations.

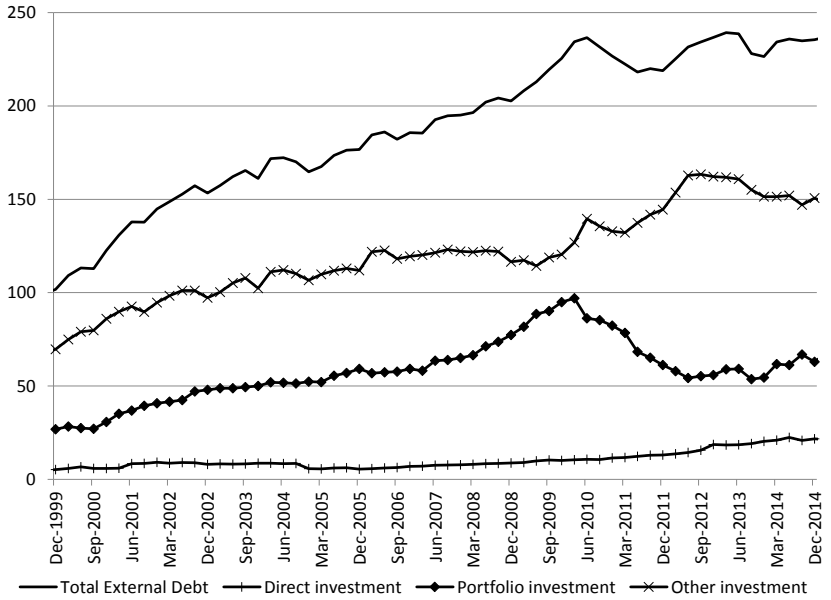
We consider the relative weight of each liability throughout the period of analysis. The external debt was higher than the equity investments (Figure 2 and Figure 3).[4] Afonso et al. (2019) advised more cautious on the sustainability of the external debt. There were increases in external debt during the 1999-2010 period, in which the other investment and portfolio investment were the main categories.

The portfolio investment category was higher than the direct investment category, reaching a maximum during the financial crisis and experiencing a reduction during the EFAP. However, the portfolio investment (debt instruments) does not include external debt from international institutions for the public sector.

[4] The equity instruments are included within direct investment and portfolio investment. The external debt is included within direct investment, portfolio investment and other investment (Figure 2 and Figure 3).

Figure 3 – Gross external debt: disaggregation by instrument

(percentage of GDP)



Source: *BdP – Banco de Portugal*, *INE* – Statistics Portugal and own calculations.

The following paragraphs assess econometrically the determinants of the variation in the main categories and instruments underlying the IIP. The regressors are based on the previous literature. Some regressors and equations were tested, but they were not statistically significant. Therefore, Table II does not include them for the sake of parsimony.

Portfolio investment and direct investment

Table II presents the estimations for the ratio between the portfolio investment category and the direct investment category (regressions from 1 to 3). This ratio considers both numerator and denominator at market prices. Therefore, the price effect is subdued in the case where there is a similar price evolution of the portfolio and direct investments.

The results show that higher financial integration in government bonds of the euro area was beneficial for the ratio of portfolio investment to direct investment. Therefore, a rise in cross-border holdings of other euro area government bonds (1p.p.) increased the weight of the portfolio investment over the direct investment (3.63p.p. in regression 2). This suggests it was easier to reallocate portfolio investment among countries and international financial markets than direct investment. Furthermore, this result is in agreement with Hobza and Zeugner (2014), in which the authors concluded that external funding in the current account deficit countries was based on debt instruments rather than equity ones.

During the EFAP, the weight of portfolio investment in direct investment decreased. This result is explained by the official debt to rescue the public sector (Figure 3) and a slight increase in direct investment. In this way, the position of the other investment is statistically significant.

Table II – Estimations of the quarter-on-quarter liabilities underlying the IIP

(percentage points)

	$\Delta\left(\frac{Portfolio\ investment_t}{Direct\ investment_t} * 100\right)$			$\Delta\left(\frac{Portfolio\ investment\ debt_t}{GDP_t} * 100\right)$			$\Delta\left(\frac{Direct\ investment\ equity_t}{GDP_t} * 100\right)$			$\Delta\left(\frac{Porfolio\ investment\ equity_t}{GDP_t} * 100\right)$		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
constant	1.50	2.49**	2.24**	1.52***	1.88***	1.77***	0.28**	0.26**	0.27**	0.41*	0.50**	0.50**
	(1.6)	(2.6)	(2.1)	(3.8)	(4.9)	(4.5)	(2.1)	(2.2)	(2.2)	(1.9)	(2.1)	(2.3)
Δ degree of openness $_t$	-1.37**	-0.91		-0.75***	-0.58**	-0.55**						
	(-2.3)	(-1.4)		(-3.3)	(-2.7)	(-2.5)						
Δ trade balance-to-GDP $_t$	-2.3*	-1.84		-0.98*	-0.82*	-0.66						
	(-1.7)	(-1.6)		(-1.7)	(-1.7)	(-1.3)						
Dummy EFAP $_t$	-3.94*	-3.3*	-4.33**	-1.82*	-1.59*	-1.67*				1.00**	1.02**	1.07**
	(-2.0)	(-1.7)	(-2.2)	(-2.0)	(-1.9)	(-1.9)				(2.4)	(2.5)	(2.4)
Δ IIP balance of the Other investment-to-GDP $_t$		1.33***	1.41***		0.48***	0.45***						
		(6.7)	(7.4)		(6.4)	(5.7)						
Δ Portuguese sovereign yield 10 years $_{(t-j)}$						-0.75**			-0.14	-0.84***	-0.83***	-0.89***
						(-2.0)			(-0.8)	(-3.3)	(-3.3)	(-3.3)
Δ Euribor 3 month $_t$							-0.76*	-0.93**	-0.86**	-1.28**	-1.15**	-1.16**
							(-1.8)	(-2.4)	(-2.2)	(-2.4)	(-2.4)	(-2.6)
Δ cross holdings of government bonds $_t$	3.99**	3.63**	4.26***	1.38*	1.25***	0.99**						
	(2.4)	(2.7)	(3)	(1.9)	(2.7)	(2.2)						
Δ cross holdings of corporate bonds $_t$							0.79**	0.71**	0.67**		-0.26	
							(2.3)	(2.1)	(2)		(-0.8)	
Δ CISS $_t$							-5.17***	-5.38***	-4.98***	-4.98*	-5.34*	-4.92*
							(-5.2)	(-4.7)	(-4.5)	(-1.7)	(-1.9)	(-1.7)
q-o-q variation rate S&P 500 index $_{(t-k)}$								0.04***	0.04***	0.10***	0.10***	0.11***
								(2.9)	(2.9)	(4.6)	(4.7)	(5.3)
q-o-q variation rate EUR/USD $_{(t-p)}$								-0.05**	-0.06**			-0.08*
								(-2.0)	(-2.0)			(-1.9)
Dummy financial crisis $_t$										-1.80***	-1.96***	-1.98***
										(-4.3)	(-4.2)	(-4.5)
Period t-j						t-1			t-1	t-4	t-4	t-4
Period t-k								t-2	t-2	t-1	t-1	t-1
Period t-p								t-2	t-2			t-1
R-square	0.24	0.42	0.39	0.36	0.55	0.57	0.26	0.35	0.36	0.49	0.49	0.51
Durbin-Watson	2.19	2.04	1.89	1.91	1.78	1.84	1.83	1.96	1.94	2.01	2.05	1.96
Observations	59	59	59	59	59	59	59	59	59	59	59	59
Period	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4	2000:2-2014:4

Notes: t-statistics in brackets. *, **, *** denote significance at 10, 5 and 1% levels estimation. Heteroskedasticity and Autocorrelation Consistent Covariance (HAC) or Newey-West estimator. Equations were estimated by ordinary least squares. The row "Period t-j" means the independent variable whose subscript is t-j would be lagged j quarters. The rows "Period t-k" and "Period t-p" have a similar meaning.

Portfolio investment debt

The debt instrument included in portfolio investment is the highest liability (Figure 2). The determinants of the variation of the portfolio investment debt (Table II) were the degree of openness and the trade balance, whose effects were negative (regressions 4 and 5). This result suggests that higher trade balance meant less net borrowing.

The period during the EFAP had a negative impact due to the increase of public debt held by international institutions, which was recorded in the other investment. In regression 4, an increase in exports (1p.p. of GDP) meant a reduction of the dependent variable (-1.73 = -0.75-0.98), i.e. rises in exports improved external accounts and reduced the net borrowing. However, an increase in imports (1p.p. of GDP) meant a rise in the portfolio investment debt-to-GDP (0.23 = -0.75-(-0.98)). In addition, the lagged variation of the Portuguese 10-year sovereign yield (100 basis points) decreased the weight of portfolio investment debt-to-GDP (0.75p.p. in regression 6), as a result of decreases in sovereign bond prices and outflows.

Higher financial integration in the euro area increased the holdings of Portuguese debt liabilities by non-resident holders, but it was detrimental during periods of financial fragmentation. Financial integration allowed funding the decrease of the non-cyclical current account (Afonso and Silva (2017)). This result reveals the vulnerability of the Portuguese external funding in relation to changes in financial integration. In addition, the position of the other investment is statistically significant, which means that the increase of the external official debt offset the reduction of the portfolio investment debt.

The other variables considered in this analysis were not statistically significant: budget balance, the composite indicator of systemic stress (CISS) in the financial system, the S&P 500 index and potential output. We do not report the results for parsimony.

Direct investment equity

Table II details the results for the determinants of the direct investment (equity instrument). An increase of the 3-month Euribor rate (100 basis points) was detrimental to the direct investment equity-to-GDP (0.86p.p. in regression 9). The rise in interest rates had a negative impact on share prices, which reflects the inverse relationship between prices and interest rates. In addition, the financial stress in Europe measured by the CISS was damaging for the dependent variable because investors reallocate funding from private equity to sovereign debt during periods of financial instability. The lagged depreciation of the euro (decrease of the EUR/USD exchange rate) had a negative impact on the dependent variable, which was expected by the interest rate parity condition.

Financial integration in the euro area corporate debt was beneficial for the holdings of the Portuguese equity liabilities held by non-residents. In periods of higher financial integration, non-residents were more likely to buy shares of Portuguese corporations and/or finance equity issuances. Furthermore, the lagged increase of the S&P 500 had a beneficial effect on the dependent variable. The US stock market had a positive impact on the liabilities of the Portuguese direct investment equity held by non-residents. The S&P 500 is a proxy for the world stock market evolution.

Portfolio investment equity

Finally, the estimations (Table II) demonstrate that the period after the 2009 financial crisis was damaging to the portfolio investment equity. This result is explained by the negative effect of the financial crisis on international stock markets. In addition, the lagged variation of the Portuguese 10-year sovereign yield (100 basis points) was detrimental for the dependent variable (-0.89p.p. in regression 12) because sovereign yield is a proxy for the risk of the country.

On the other hand, the lagged rise of the S&P 500 had a positive impact on the dependent variable, i.e. the increase of the US stock market had a positive effect on the holding of the Portuguese portfolio equity liabilities held by non-residents. Portugal benefitted from the valuation in international stock markets. The 3-month Euribor rate (+100basis points) damaged the portfolio investment equity-to-GDP (1.16p.p.). This means that interest rates have a negative effect on share prices due to their inverse relationship. The CISS had a negative impact because the financial stress damages the international stock markets. The appreciation of the euro (EUR/USD) reduced the Portuguese equity liabilities. There was a positive effect of the EFAP period on the portfolio investment equity.

6. Conclusions

The aim of this study is to assess the Portuguese external funding over the 1999-2014 period. We estimate the determinants of changes in the categories and instruments of the IIP. Our estimates suggest that the structure of external funding was affected by both external and domestic factors.

The equity instruments were negatively affected by the financial stress indicator in Europe, the 3-month Euribor rate and the exchange rate (EUR/USD), but positively by the S&P 500 index. Additionally, financial integration in the euro area corporate bonds had a positive impact on the direct investment equity instruments, while financial integration in the euro area government bonds affected positively the portfolio investment debt instruments.

Regarding the domestic variables, the Portuguese 10-year sovereign yield affected negatively the portfolio investment (equity and debt), the exports-to-GDP ratio reduced the portfolio investment category and the EFAP period decreased the portfolio investment debt instruments in favour of the equity instruments.

The results suggest that financial integration in the euro area allowed the funding of the Portuguese current account deficits, while financial fragmentation determined outflows. In addition, the portfolio investment liabilities were increasingly higher than the direct investment liabilities until the financial crisis, which made the funding of the Portuguese economy become more exposed (vulnerable) to changes (decreases) in financial integration. Additionally, debt instruments were higher than equity instruments, which means Portugal might have been unable to share risk with foreign investors. Return on equity instruments are procyclical, while return on debt instruments may be countercyclical. The negative IIP determined negative primary income accounts in the following years due to interests, rents and profits that the Portuguese economy had to pay to non-residents. This requires a positive trade balance and secondary income account to ensure a positive current account.

Concerning policy implications, higher levels of debt instruments than equity instruments reflected the increase in vulnerability to financial stress in Europe and financial integration. Given that Portugal is a member of the EMU, it is prudent to reduce its exposure to financial markets. Improving the IIP requires positive trade balances and/or positive secondary income accounts over the medium term to offset the negative primary income account and achieve a positive current account. These flows will increase the IIP, reduce the exposure to financial integration/fragmentation and decrease the rollover of external debt. Additionally, the Portuguese authorities should incentivise stable external funding in order to reduce the dependence on external factors. For example, creating tax incentives to increase equity in the companies' balance sheets and direct investment (in particular new industrial plants and other investment with impact on the capital stock and production function).

These findings may be useful in guiding future policy-making in small open economies.

7. References

Afonso, A.; Huart, F.; Jalles, J. T. and Stanek, P. (2019) "Assessing the Sustainability of External Imbalances in the European Union." *The World Economy* 42 (2): 320–348. https://doi.org/10.1111/twec.12709.

Afonso, A. and Silva, J. (2017) "Current account balance cyclicality." *Applied Economics Letters*: 911-917. https://doi.org/10.1080/13504851.2016.1240333.

Catão, L. and Milesi-Ferretti, G. M. (2014) "External Liabilities and Crises", *Journal of International Economics*, 94(1), pp.18-32. https://doi.org/10.1016/j.jinteco.2014.05.003.

Chen, R.; Milesi-Ferretti, G. M. and Tressel, T. (2013) "Eurozone external imbalances." *Economic Policy*, January: 101-142. https://doi.org/10.1111/1468-0327.12004.

Faria, A.; Lane, P. R.; Mauro, P. and Milesi-Ferretti, G. M. (2007) "The Shifting Composition of External Liabilities." *Journal of the European Economic Association* 5, no. 2/3: 480-490.

Hobza, A. and Zeugner, S. (2014) "Current accounts and financial flows in the euro area." *Journal of International Money and Finance,* Volume 48, Part B, November, Pages 291-313. https://doi.org/10.1016/j.jimonfin.2014.05.019.

Lane, P. R. and Milesi-Ferretti, G. M. (2008) "International Investment Patterns." *The Review of Economics and Statistics* 90(3) August: 538–549.

Lane, P. R. and Milesi-Ferretti, G. M. (2012) "External adjustment and the global crisis." *Journal of International Economics*, 4 January: 252-265. https://doi.org/10.1016/j.jinteco.2011.12.013.

Reis, R. (2013) "The Portuguese Slump and Crash and the Euro Crisis." *Brookings Papers on Economic Activity*, Spring: 143-193.

Turrini, A. and Zeugner, S. (2019) "Benchmarks for net international investment positions." *Journal of International Money and Finance*, https://doi.org/10.1016/j.jimonfin.2019.01.017.