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New data: digging into the net-inflow analysis with the rest of the world¹

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Abstract

This paper examines official statistics published by Banco de Portugal (*BPstat*) on international capital flows that affect the real economy and whose knowledge serves policymakers' decisions. Matrix-correlations between financial flows for critical periods in the Portuguese economy were built. The results reveal that they are independent of trade flows and, in many cases, correlate with each other. The usefulness of the flow of funds vis-à-vis the rest of the world is demonstrated. Moreover, the study goes beyond a traditional net-inflow analysis and brings new data on gross flows, enriching the debate on financial flows among institutional sectors.

Keywords: capital flows, external statistics, national accounts, Portuguese economy

JEL classification: F41, G23, O16

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1. Introduction

This work focuses on the case of Portugal, a peripheral economy that joined the Eurozone in 1999 and which, like other economies, has attracted attention for having accumulated successive external deficits up until the Global Financial Crisis (GFC), without an obvious explanation for this.

The goal of this paper is to offer an analysis focused on the evolution of gross capital flows rather than a limited approach based on the evolution of the current account balance. For this purpose, balance-of-payments statistics are combined with data from national financial accounts statistics, taken from Banco de Portugal's statistical website (*BPstat*).

The examination of gross capital flows by instrument, functional category, or sector is frequently overlooked, as we will observe in the next section. However, this study diverges by applying such an analysis to Portugal, thereby enhancing the depth and findings of the analysis. As a result of an analysis of correlations between gross capital inflows by sector and functional category, Section 3 sets three stylized facts which enable us to understand the role of each agent in the international financial activity.

In addition to the preceding analysis, Section 4 highlights a diagram illustrating financial interactions among institutional sectors: the flow of funds. Through an instrument-by-instrument and inter-sectoral analysis, it becomes evident that net flows stem from significant gross operations, thus surpassing the scope of traditional flow of funds assessments. Section 5 concludes with final remarks.

In a nutshell, the paper demonstrates the interplay and autonomy of international capital flows, operating independently from trade flows. Merely assessing a net inflow proves inadequate, underscoring the need for central banks and policymakers to employ analytical methodologies that go beyond the conventional conceptual frameworks.

2. Literature review: on the relevance of the current account balance

The economic analysis does not provide numerical benchmarks for determining what is a 'good' current account balance (Milesi-Ferretti and Blanchard 2009). Gourinchas and Obstfeld (2012) argued that the current account generally does not play a significant role in predicting financial crises and many of the financial crises have occurred in countries with current account surpluses.

How the economy finances itself externally matters, which is not always visible in the net lending (+) / net borrowing (-) balance. Looking at the changes in the International Investment Position (IIP), this is likely affected by price and volume changes in financial assets that are not included in the current account balance. In addition, the net values of the financial account, translated by its balance, hide financial phenomena that can only be perceived by separating assets and liabilities (Obstfeld 2012). The maturity of the financing received and sourced externally is also an indicator of an economy's solvency. The global external statistics are worth even more than the current account (residual) balance.

However, some empirical literature shows that the current account balance is a predictive indicator of financial crises, especially if countries accumulate liabilities denominated in debt rather than in equity (Catão and Milesi-Ferretti 2014). In the 1990s, sufficient experience already existed in developing countries to show that current account deficits matter. Many analysts linked the external account imbalances to crises in Mexico in 1994/95 and in Asia in 1997, and its importance is not confined to these countries but rather is global (Tatom 1998). Other authors

show that reversing this situation can be pretty painful (regarding income losses and depreciations), especially in countries with deficits financing consumption or with low openness to foreign capital (Freund and Warnock 2007; Razin and Milesi-Ferretti 1998).

Alternatively, some authors have explored the relevance of gross capital flows, considering the behaviour of gross outflows individually (the net acquisition of assets) and gross inflows (the net incurrence of liabilities) in the balance-of-payments – see the explanatory works by Forbes and Warnock (2012), Broner et al. (2013), or Pérez (2019). For a recent body of literature, it is recognized that a country may maintain relatively stable external balances while concealing potentially destabilizing gross capital flows. Consequently, gross capital flows operate independently of the current account balance, and net capital flows emerge as a consequence of consumption and investment requirements, rather than serving as a catalyst for external imbalances (Kohler 2022, 2023).

Avdjiev et al. (2018) show that capital inflows are pro-cyclical for a panel of 85 countries and that this behaviour is driven by banks in advanced countries and by sovereigns in developing countries. Borio and Disyatat (2011) point out that current account balances and net capital flows show little about financing. For example, purely financial transactions that do not involve current account items which makes it difficult for one to capture the role that the country plays in terms of lending and financial intermediation, as well as the financial risks to which the country may potentially be exposed. That kind of narrative clearly distinguishes the notion of savings (or the net lending capacity of the economy) from financing, which is visible in an economy's flow of funds.

3. What do capital flows tell us about the Portuguese economy?

The examination of gross capital flows, employing correlations between transactions, as conducted in the study by Avdjiev et al. (2018) across a panel of countries, yields valuable insights. When applied to Portugal, this approach reveals additional nuances regarding the dynamics of capital flow drivers, which may elude observers solely focused on the current account balance.

Correlations were analyzed for gross inflows and outflows by functional category¹ and sector (only non-financial corporations – S.11; financial corporations – S.12; general government – S.13), exports and imports of goods and services, and the current account balance as a percentage of GDP.

Data retrieved from Banco de Portugal (*BPstat*) were used for the year ending each quarter, separating four recent periods of the Portuguese economy: the period covering the process of joining the euro and the first years of the single currency (1996Q4-2007Q4); the period between the global financial crisis and the end of the euro crisis (2008Q1-2013Q4); a period up to the pandemic crisis (2014Q1-2019Q4); a period covering the pandemic crisis and its aftermath (2020Q1-2023Q4). The correlation matrices, with their statistical significance, can be found in the Annex section.

¹ According to the sixth edition of the Balance of Payments Manual (IMF, 2009) “functional categories are the primary classification used for each of financial transactions, positions, and income in the international accounts” (pp. 99). There are three functional categories analyzed here: “foreign direct investment” (FDI), which implies “control or a significant degree of influence on the management of an enterprise that is resident in another economy”; “portfolio investment” (PI) defined as “cross border transactions and positions involving debt or equity securities, other than those included in direct investment or reserve assets”; and “other investment” (OI), “a residual category that includes positions and transactions other than those included in direct investment, portfolio investment, financial derivatives and employee stock options, and reserve assets”.

A series of empirical observations on economic growth proposed in Kaldor (1957) was called “stylized facts”. The following are some of the stylized facts that come out of this correlation analysis.

Stylized fact 1: Gross capital foreign inflows and outflows by financial corporations (S.12) are correlated.

A large part of the accumulation of external gross inflows into the economy up until the GFC took place through the banking sector. The key to understanding the process of capital outflows and inflows involves this sector. During the periods under analysis, there are examples of correlations between capital inflows and outflows by financial corporations (including Central Bank) towards the rest-of-the-world.

The synchronization between the inflows and outflows of gross (non-net) financial flows with the rest of the world, carried out by the financial sector, can be seen graphically. Figure 1 shows graphically the correlation between “Foreign Direct Investment” inflows and outflows, for the period 1996Q4-2007Q4. Figure 2 shows the correlation between “Portfolio Investment” inflows and outflows carried out by the financial sector, for the period 2008Q1-2013Q4. This is a crisis period marked by the disinvestment of Portuguese banks abroad, and by foreign disinvestment in Portuguese banks. Figure 3 shows the correlation between inflows and outflows in “Other Investment” debt, between 2014Q1 and 2019Q4. All these movements show statistically significant correlation rates of over 65%, revealing great harmonization between capital inflows and outflows led by banks.

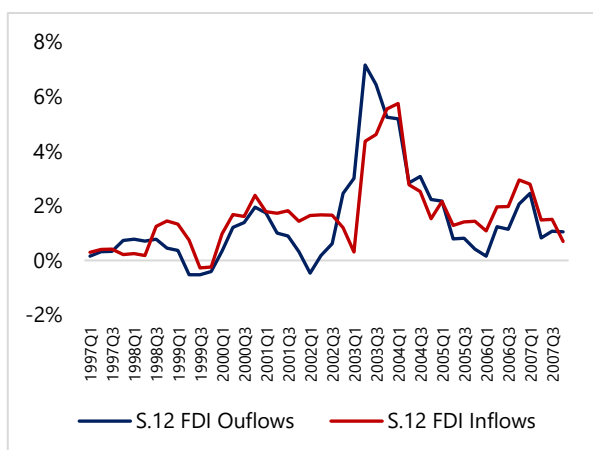


Figure 1 - Total amount of FDI gross inflows and outflows from financial corporations, **1996Q4-2007Q4** (4-quarters moving sum, % GDP). Correl.: 0.85***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

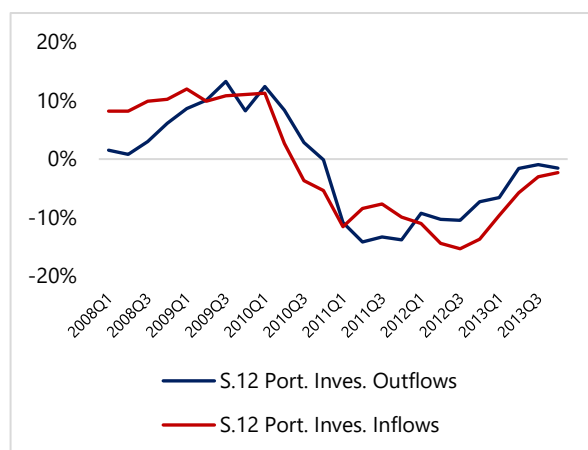


Figure 2 - Total amount of portfolio investment gross inflows and outflows from financial corporations, **2008Q1-2013Q4** (4-quarters moving sum, % GDP). Correl.: 0.88***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

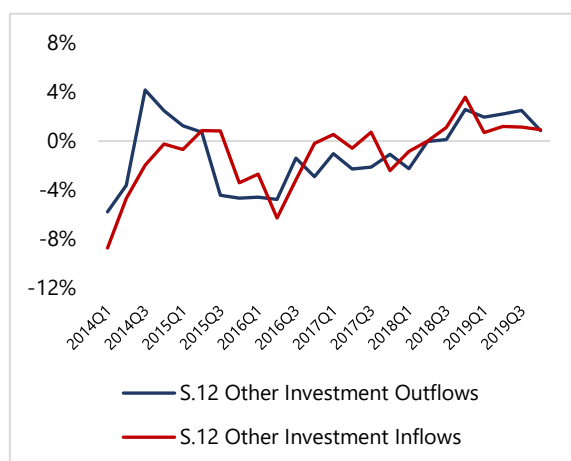


Figure 3 - Total amount of other investment gross inflows and outflows from financial corporations, **2014Q1-2019Q4** (4-quarters moving sum, % GDP). Correl.: 0.65***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

Stylized fact 2: Gross capital inflows on portfolio investment from the general government and outflows from the financial sector are correlated.

Prior to the GFC, the public sector experienced a growth in its "Portfolio Investment" liabilities that mirrored the pace of investment abroad being made by the financial sector, also in the "Portfolio Investment" category (Figure 4).

During the period between the crises (2008-2013), disinvestment in government bonds by non-residents was accompanied by "portfolio disinvestment" in foreign assets by the financial sector (Figure 5). The economic turmoil in Portugal led to outflows as investors sought safer havens.

During and after the COVID-19 pandemic (Figure 6), we also saw a reduction in foreign “Portfolio Investment” in assets issued by the public sector, at the same time as the financial sector reduced portfolio investment in assets issued abroad. These correlations highlight distinct approaches of the general government and the financial sector towards financial markets. For instance, during periods when the public sector seeks to acquire liquidity, the financial sector demonstrates a propensity to invest it overseas.

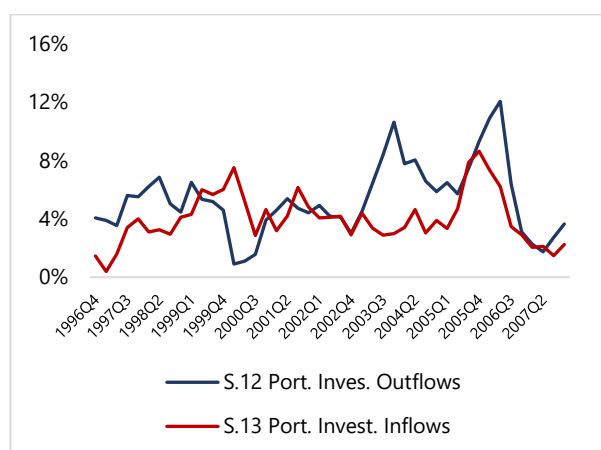


Figure 4 - Total amount of portfolio investment gross inflows and outflows from government and financial corporations, respectively, **1996Q4-2007Q4** (4-quarters moving sum, % GDP). Correl.: 0.54***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

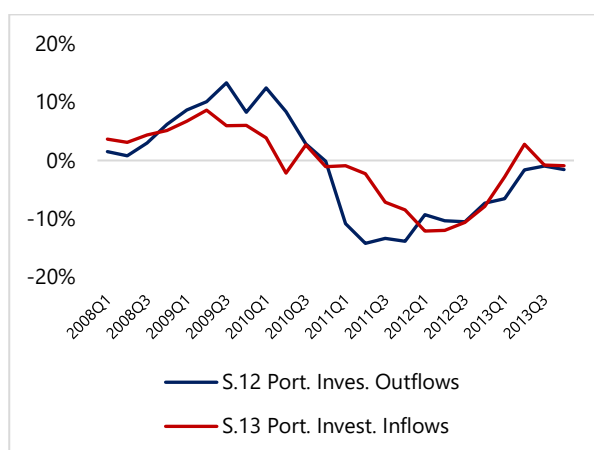


Figure 5 - Total amount of portfolio investment gross inflows and outflows from government and financial corporations, respectively, **2008Q1-2013Q4** (4-quarters moving sum, % GDP). Correl.: 0.81***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

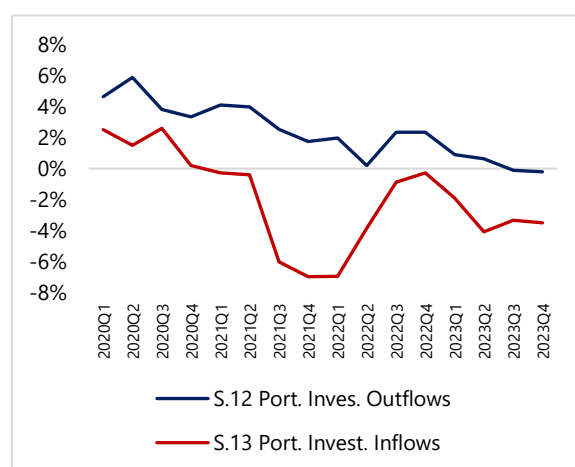


Figure 6 - Total amount of portfolio investment gross inflows and outflows from government and financial corporations, respectively, **2020Q1-2023Q4** (4-quarters moving sum, % GDP). Correl.: 0.71***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

Stylized fact 3: Trade flows generally have little correlation with gross capital flows.

The correlation matrices show little relationship between gross capital flows with export transactions, imports of goods and services, and the current account balance. For the first period (1996Q4-2007Q4), the average correlations stand at 0.1, while for the second period (2008Q1-

2013Q4), they are -0.1. In the third period (2014Q1-2019Q4), the average correlations remain at 0.10, and in the last period (2020Q1-2023Q4) stood at 0.2.

This finding reinforces the argument that there are capital flows that are quite independent of the current account activity and are invisible if the analysis is based on net capital flows (Pérez 2019). The weak correlation between current account movements and changes in the IIP was also detected in the empirical work of Obstfeld (2012). On the other hand, trade in goods and services is strongly and positively correlated with each other (for more details, see the correlation matrices in Annex).

Even so, for the period between crises (2008Q1-2013Q4), there are strong and significant correlations between exports of goods and services, and capital inflows into non-financial corporations in the form of “Foreign Direct Investment” (see Figure 7, for exports of goods). Although less pronounced, there exists a positive and statistically significant correlation between “Foreign Direct Investment” in Portuguese firms and exports of goods and services during the period 2014Q1-2019Q4 (see Figure 8, for exports of services).

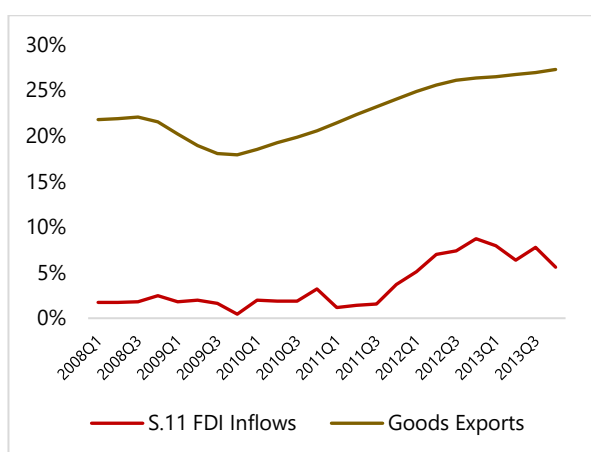


Figure 7 - Total amount of Foreign Direct Investment (FDI) gross inflows into firms and exports of goods, **2008Q1-2013Q4** (4-quarters moving sum, % GDP). Correl.: 0.8***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

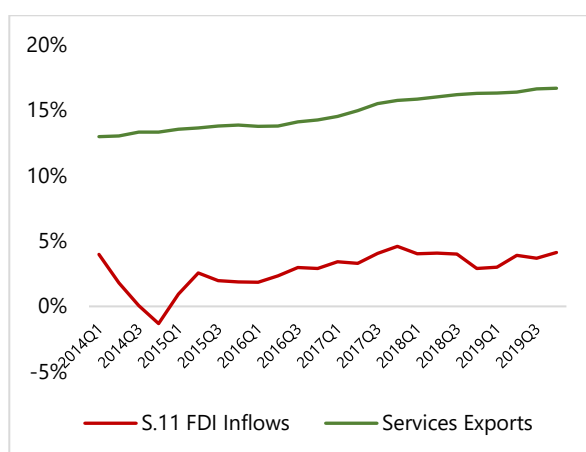


Figure 8 - Total amount of Foreign Direct Investment (FDI) gross inflows into firms and exports of services, **2014Q1-2019Q4** (4-quarters moving sum, % GDP). Correl.: 0.76***. Source: author's calculations on Banco de Portugal (*BPstat*) database.

4. Going deeper into the flow of funds

The balance of payments is reflected in the financial account of the total economy vis-à-vis the rest of the world. Thus, the analysis of financial accounts between institutional sectors can offer additional insights into the study of financial flows with non-residents. A flow of funds provides a picture of the inter-sectorial patterns of financial flows in an economy. It is a graphic representation of a from-whom-to-whom financial account (as explained in the methodological reference manual for national accounts – ESA 2010). The area of each circle is proportional to the net lending (+) / net borrowing (-) of the sector vis-à-vis all other sectors (green if positive and red if negative). The arrows' direction goes from net creditor to net debtor. The arrows' width is proportional to the magnitude of the inter-sectorial financial flow.

As in the previous section, we have divided the analysis into four key periods for the Portuguese economy: 1996-2007, 2008-2013, 2014-2019, and 2020-2023. In this exercise we present an analysis of the cumulative net financial flows (as a percentage of cumulative GDP for

the period in question) between the resident institutional sectors and the rest of the world. The net borrowing (+) / net borrowing (-) for each sector (towards all other sectors) are also cumulative and in percentage of GDP.

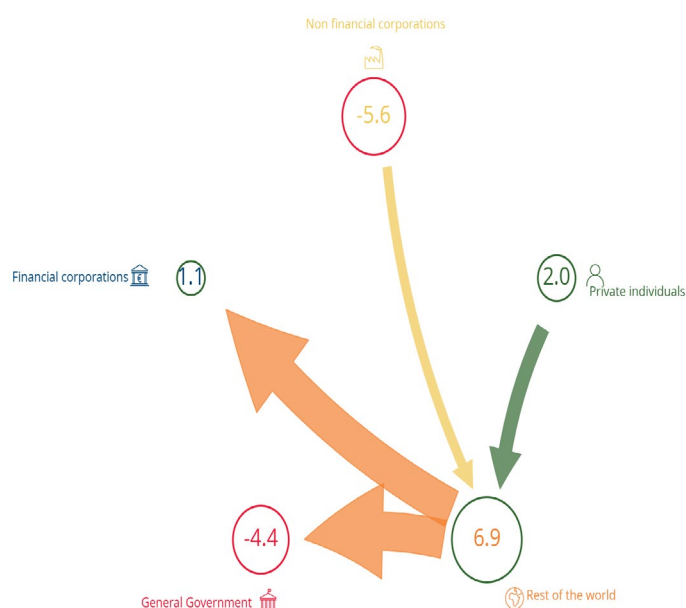


Figure 9 - Flow of funds for accumulated values, as a percentage of GDP (1996-2007). Source: author's calculations on Banco de Portugal (*BPstat*) database.

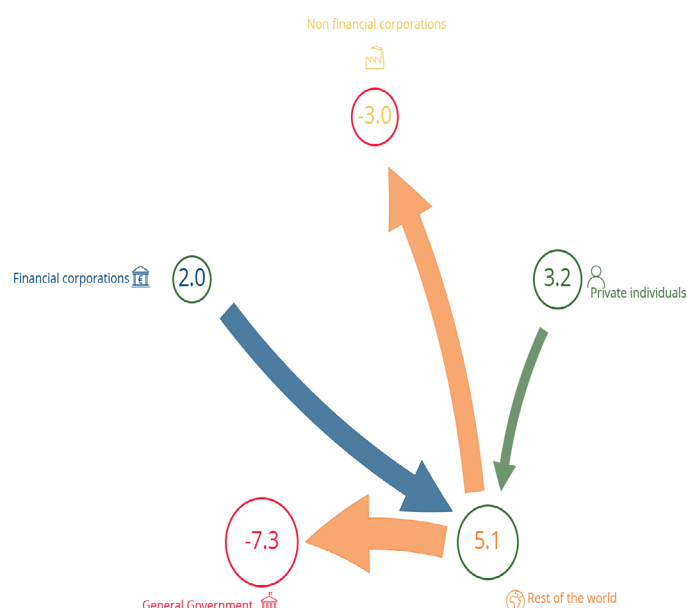


Figure 10 - Flow of funds for accumulated values, as a percentage of GDP (2008-2013). Source: author's calculations on Banco de Portugal (*BPstat*) database.

During the initial two periods under analysis, spanning from 1996 to 2007 (Figure 9) and from 2008 to 2013 (Figure 10), the Portuguese economy exhibited a pattern of net borrowing, indicating that it was financed by external sources. Specifically, the current and capital accounts for the period spanning 1996 to 2007 stood at -6.9% of accumulated GDP, closely resembling the balance observed between 2008 and 2012, which amounted to -5.1%.

The flow of funds allows us to go beyond analyzing the balancing item of the total economy with the rest of the world. Between the two periods, the general government continued to be financed in net terms from abroad, and its external deficit worsened. This is connected to the stylized fact 2, presented above. Until 2008, the public sector experienced a growth in “Portfolio Investment” liabilities, which increased the accumulated financing needs vis-à-vis the rest of the world.

Financial corporations started to finance the external sector after 2008, and non-financial corporations started to be financed in net terms by the rest of the world. Private individuals, on the other hand, reduced their net financing to the rest of the world.

For the cumulative period spanning 2014 to 2019 (Figure 11), a notable shift occurred, as the rest of the world transitioned from a position of net lending to the Portuguese economy, amounting to 5.1% of accumulated GDP, to one of net borrowing, totaling 1.8%.

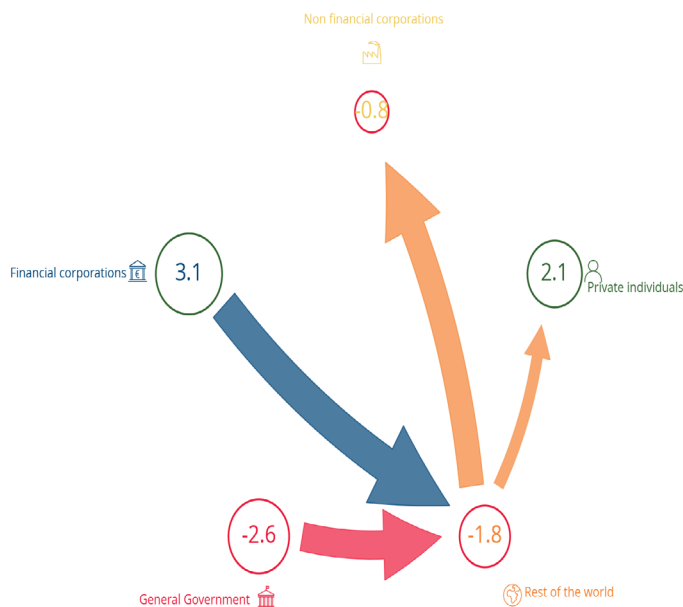


Figure 11 - Flow of funds for accumulated values, as a percentage of GDP (2014-2019). Source: author's calculations on Banco de Portugal (BPstat) database.

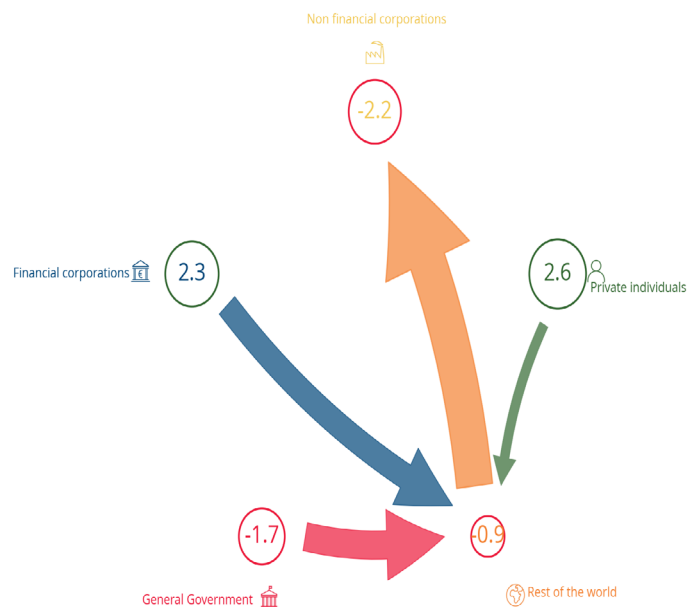


Figure 12 - Flow of funds for accumulated values, as a percentage of GDP (2020-2023). Source: author's calculations on Banco de Portugal (BPstat) database.

Until 2013 and since then, the government deeply changed the direction of its net flows with the rest of the world. Between 2014 and 2019, the former provides net financing to the rest of the world (Figure 11) mainly by reducing its gross liabilities in the form of loans (or the rest of the world reduces its assets vis-à-vis the government).

Moreover, from 2020 onwards (Figure 12), private individuals re-began to finance the rest of the world in net terms (as in the period between 1996 and 2013). Since 2020, the government has been reducing its gross liabilities to the rest of the world, mainly in the form of debt securities. This is the type of analysis that looks at operations in gross terms (only for assets or only for liabilities, and not for their difference) that we propose next.

The instrument-by-instrument and sector-by-sector analysis, using data available since 2012, that also allows the split between assets and liabilities, enables us to conclude that even when an institutional sector is in a net borrowing situation, it can finance other sectors in gross terms, a phenomenon not readily apparent in traditional flow of funds analysis (in net terms) or by solely examining the net lending (+) / net borrowing (-) item of each sector.

Given the public availability of gross capital flows data since 2012, it is feasible to analyze it for the two latest periods: 2014-2019 and 2020-2023. In summary, Figures 13 to 16 show gross flows (considering all the financial instruments), where the direction of the arrow aligns with the direction of the gross financing (who finances whom), and the color of the arrow is associated with the color of the institutional sector holding the asset.

How did financial corporations finance the rest of the world between 2014 and 2019? Figure 13 shows how the blue arrow in Figure 11 breaks down into two gross transactions: a thicker one, proportional to the volume of gross financing by financial corporations to the rest of the world mainly in the form of debt securities issued by the external sector²; a thinner one in the same

² Available data on: <https://bpstat.bportugal.pt/share/?svid=pe69AAAAAAA!!!A!C!10!2012-12-31!2019-12-31!False!!2024-02-08T16%3A36%3A05Z!!!!B%3A1rY7Nd%3A6ovdzZlbtPWQjP1tDpZXXSXwHz4&lang=EN>

direction, which indicates the repayment of assets issued by financial corporations and held by the rest of the world³.



Figure 13 - Going beyond the traditional flow of funds: gross transactions between financial corporations and the rest of the world (2014-2019). Source: author's calculations on Banco de Portugal (*BPstat*) database.

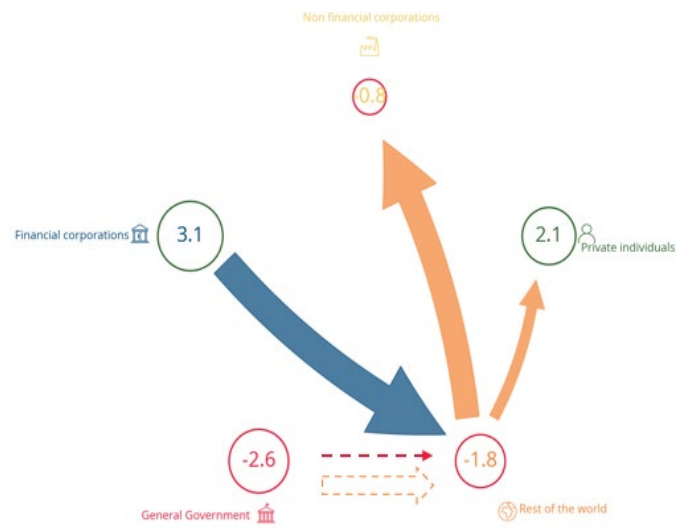


Figure 14 - Going beyond the traditional flow of funds: gross transactions between the general government and the rest of the world (2014-2019). Source: author's calculations on Banco de Portugal (*BPstat*) database.



Figure 15 - Going beyond the traditional flow of funds: gross financial transactions between government and the rest of the world (2020-2023). Source: author's calculations on Banco de Portugal (*BPstat*) database.

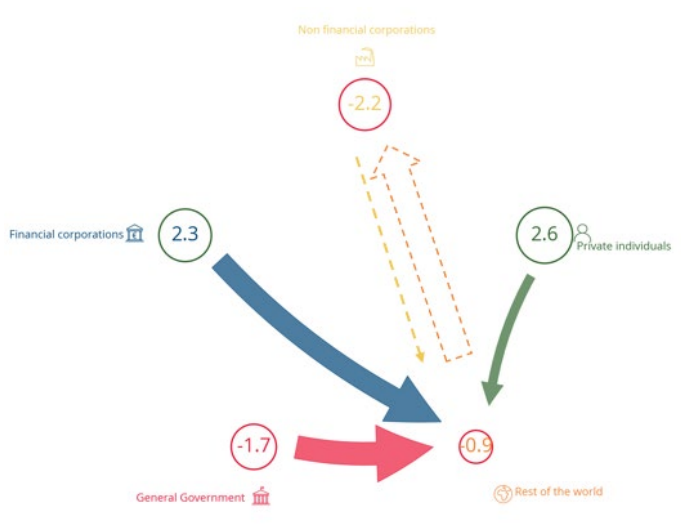


Figure 16 - Going beyond the traditional flow of funds: gross financial transactions between non-financial corporations and the rest of the world (2020-2023). Source: author's calculations on Banco de Portugal (*BPstat*) database.

The term "government is net financing the rest of the world" implies that this sector is providing more financial resources to entities outside its borders than it is receiving from them. This situation can be interpreted in two main ways:

1. The government is repaying a greater portion of its existing debt to foreign entities than it is borrowing from them. This suggests a reduction in the government's overall liabilities towards the rest of the world.

³ Available data on: https://bpstat.bportugal.pt/share/?svid=7A6-AAAAAAA!!!A!C!10!2014-12-31!2019-12-31!False!!2024-02-08T16%3A39%3A59Z!!!!B%3A1rY7RP%3AntLfsXerrnJitp3sHi_akJkHp78&lang=EN

2. The government is making more investments abroad than it is securing funds from foreign sources, thereby increasing its gross assets and potential future income.

How did general government finance the rest of the world? Figure 14, derived from data sourced from *BPstat*, corroborates the scenario of a decrease in the government's liabilities to the rest of the world, particularly in the form of loans⁴, for the period between 2014 and 2019.

Between 2020 and 2023, there was a concurrent rise in the government's assets and a decrease in its liabilities to the rest of the world, mainly in the form of debt securities⁵ (see Figure 15). Essentially, the two red arrows in the flow of funds in Figures 11 and 12 tell different stories in terms of how the government and the rest of the world interact.

How did non-financial corporations finance the rest of the world between 2020 and 2023? Figure 16 shows a case of two sectors with a net borrowing balance that finance each other in gross terms. In other words, a net flow is broken down into two gross flows with different directions of financing. Between 2020 and 2023, there was a significant increase in the rest of the world's assets vis-à-vis non-financial corporations (through other instruments than debt securities and loans). At the same time, there was a less significant increase in the rest of the world's liabilities relative to non-financial corporations (mainly through loans⁶).

5. Conclusions

This article provides a comprehensive and integrated approach that combines balance of payments data with national financial accounts figures sourced from the Portuguese central bank. Capital flows pose complexity in analysis for both users and policymakers, who often prioritize examining net flows while overlooking the intricate dynamics inherent in gross capital flows. Thus, this paper sheds new lights on gross capital flows going behind a mainstream analysis based on net flows.

Statistical correlation matrices between operations indicate that gross international capital flows are indeed correlated with each other. Financial corporations played the role of drivers of financial flows with foreign countries, acting as intermediaries for the arrival and departure of capital flows.

The inflows and outflows of portfolio investment between the government and the financial sector, both domestically and abroad, exhibit correlation. This correlation sheds light on the interplay between financial markets and these sectors, highlighting the public sector's role as a counterbalancing force to the actions of banks in financial terms.

Another significant finding is that gross capital flows largely operate independently of trade flows and the current account balance. This implies that solely relying on the latter indicator provides limited insights into the economic interactions vis-à-vis the rest of the world.

The flow of funds between institutional sectors complements this analysis if we focus on the rest of the world and from a national financial accounts perspective. Interactions among sectors can undergo substantial changes, even as the net lending/net borrowing of the total economy remains relatively stable.

⁴ Available data on: <https://bpstat.bportugal.pt/share/?svid=UY69AAAAAAA!!!A!C!10!2014-12-31!2019-12-31!False!!2024-03-19T21%3A45%3A47Z!!!!B%3A1rmhHH%3AAdlrTBBEDMPBipteMock54BFz10&lang=EN>

⁵ Available data on: <https://bpstat.bportugal.pt/share/?svid=bbS9AAAAAAA!!!A!C!10!2020-12-31!2023-12-31!False!!2024-06-23T19%3A26%3A49Z!!!!B%3A1sLRvN%3Ao1yBaEAdW28XNOChvbzkOj2t9AU&lang=EN>

⁶ Available data on: <https://bpstat.bportugal.pt/share/?svid=NnK9AAAAAAA!!!A!C!10!2020-12-31!2023-12-31!False!!2024-06-23T19%3A34%3A39Z!!!!B%3A1sLS2x%3AFzuCb UohctUO S0EWTLyieBKjY&lang=EN>

Moreover, delving deeper into the data allows for an exploration of the factors contributing to a net flow between sectors. When one sector provides net financing to another, it is essential to distinguish whether this net investment manifests as an increase of gross assets or a diminishment of gross liabilities. Additionally, the analysis demonstrates that a sector with a net borrowing balance, or receiving net financing from another, is not precluded from providing financing to other sectors in gross terms.

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7. Annex

			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods	Services	CAB		
			PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	Export	Import	Export	Import	Balance
Assets	Public	PI	1.0																						
	Public	DI	-0.05*	1.0																					
	Public	OI	0.3	-0.77***	1.0																				
	Bank	PI	-0.17*	-0.04*	0.13*	1.0																			
	Bank	DI	0.16*	-0.01*	0.03*	0.36**	1.0																		
	Bank	OI	0.23*	0.21*	-0.3	0*	0.17*	1.0																	
	Company	PI	0.35**	-0.03*	-0.16*	-0.38**	-0.08*	-0.12*	1.0																
	Company	DI	0.2*	0.07*	0.08*	-0.33**	-0.52***	0.01*	0.13*	1.0															
	Company	OI	0.35**	-0.02*	0.11*	-0.12*	0.25*	0.09*	-0.07*	-0.3	1.0														
Liabilities	Public	PI	0*	-0.09*	0.3	0.54***	-0.13*	-0.1*	-0.3	0.15*	-0.16*	1.0													
	Public	DI	0.15*	-0.08*	0.13*	0.3	0.7***	-0.01*	-0.2*	-0.74***	0.44***	0.01*	1.0												
	Public	OI	-0.09*	0.22*	-0.3**	0.19*	0.52***	0.03*	0.17*	-0.36**	-0.19*	-0.3	0.35**	1.0											
	Bank	PI	0.12*	0.4***	-0.24*	0.16*	0.34**	0.71***	-0.24*	-0.01*	-0.11*	-0.1*	0.06*	0.31**	1.0										
	Bank	DI	0.24*	-0.09*	0.12*	0.45***	0.85***	0.37**	-0.14*	-0.22*	0.07*	0.03*	0.39***	0.35**	0.45***	1.0									
	Bank	OI	0.61***	0.3	-0.12*	0.02*	0.34**	0.56***	0*	-0.1*	0.51***	-0.08*	0.33**	0.05*	0.42***	0.38**	1.0								
	Company	PI	0.45***	-0.42***	0.51***	-0.36**	-0.22*	-0.36**	0.49***	0.06*	0.17*	0.03*	0.05*	-0.24*	-0.48***	-0.35**	-0.06*	1.0							
	Company	DI	0.32**	0.08*	0.05*	-0.4***	-0.19*	0.31**	-0.07*	0.7***	0.15*	-0.23*	-0.42***	-0.3**	0.3	0.04*	0.22*	-0.16*	1.0						
	Company	OI	-0.3	0.17*	-0.04*	0.47***	-0.15*	0.08*	-0.3	0.13*	-0.11*	0.14*	-0.13*	0.19*	0.15*	-0.04*	-0.05*	-0.38***	0.06*	1.0					
Trade variables	Goods	Export	0.07*	0.3**	0.02*	0.35**	0.39***	0.44***	-0.45***	-0.02*	-0.09*	0.3	0.23*	0.3**	0.78***	0.52***	0.38**	-0.43***	0.16*	0.3	1.0				
	Services	Export	0.15*	0.3	0.07*	0.33**	0.3	0.38***	-0.4***	0.11*	-0.09*	0.39***	0.16*	0.21*	0.69***	0.45***	0.39***	-0.35**	0.2*	0.3	0.98***	1.0			
	Import	Import	0.06*	0.38***	-0.07*	0.3	0.3	0.49***	-0.43***	0.04*	-0.09*	0.23*	0.16*	0.3	0.8***	0.43***	0.4***	-0.46***	0.22*	0.3**	0.99***	0.97***	1.0		
	CAB	Import	0.03*	0.39***	-0.06*	0.21*	0.19*	0.45***	-0.46***	0.13*	-0.08*	0.23*	0.07*	0.2*	0.75***	0.34**	0.38**	-0.45***	0.3**	0.31**	0.96***	0.96***	0.98***	1.0	
		Balance	-0.24*	-0.22*	-0.19*	-0.2*	0.01*	-0.24*	0.32**	-0.38***	0.07*	-0.49***	0.06*	0.06*	-0.45***	-0.24*	-0.32**	0.16*	-0.33**	-0.3	-0.82***	-0.91***	-0.83***	-0.87***	1.0

Figure 1 - Correlation matrices with statistical significance, for the period 1996Q4-2007Q4.

			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods		Services		CAB
			PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	Export	Import	Export	Import	Balance
Assets	Public	PI	1.0																						
	Public	DI	0.31*	1.0																					
	Public	OI	-0.59***	-0.78***	1.0																				
	Bank	PI	0.3	0.13*	-0.3	1.0																			
	Bank	DI	0.27*	0.06*	-0.12*	-0.26*	1.0																		
	Bank	OI	-0.22*	0.4	-0.3	-0.08*	-0.17*	1.0																	
	Company	PI	-0.09*	-0.24*	0.2*	-0.14*	-0.4	0.4	1.0																
	Company	DI	0.14*	-0.07*	0.14*	0.2*	0.05*	-0.04*	0.1*	1.0															
	Company	OI	-0.18*	0.52***	-0.08*	-0.29*	0*	0.04*	-0.04*	-0.09*	1.0														
Liabilities	Public	PI	0.29*	0.29*	-0.32*	0.81***	-0.5***	-0.18*	-0.24*	-0.02*	0.03*	1.0													
	Public	DI	-0.17*	0.17*	0.22*	0.4	-0.31*	-0.24*	-0.09*	0.23*	0.42**	0.55***	1.0												
	Public	OI	-0.13*	-0.33*	0.3	-0.79***	0.61***	-0.03*	0.01*	0.02*	-0.1*	-0.9***	-0.55***	1.0											
	Bank	PI	0.46**	0.4**	-0.41**	0.88***	-0.16*	-0.13*	-0.27*	0.13*	0.03*	0.87***	0.55***	-0.78***	1.0										
	Bank	DI	-0.06*	-0.2*	0.21*	0.3*	-0.32*	-0.08*	-0.05*	-0.46**	-0.4	0.41**	0.2*	-0.31*	0.31*	1.0									
	Bank	OI	0.31*	0.33*	-0.28*	0.65***	-0.24*	0.15*	-0.11*	0.09*	-0.18*	0.69***	0.4**	-0.6***	0.76***	0.55***	1.0								
	Company	PI	-0.04*	-0.23*	0.4**	-0.18*	0*	0.07*	0.53***	0.47**	0.06*	-0.2*	0.23*	0.13*	-0.13*	-0.11*	0.08*	1.0							
	Company	DI	-0.09*	-0.28*	-0.05*	-0.41**	0.4	-0.09*	-0.15*	-0.26*	-0.59***	-0.73***	0.59***	-0.63***	-0.43**	-0.7***	-0.46**	1.0							
	Company	OI	-0.53***	0.06*	0.22*	-0.24*	-0.42**	0.56***	0.58***	0.18*	0.39**	-0.18*	0.19*	-0.13*	-0.27*	-0.16*	-0.11*	0.5***	-0.3	1.0					
Trade variables	Goods	Export	-0.19*	-0.04*	0.01*	-0.73***	0.45**	-0.13*	-0.19*	-0.4	0.27*	-0.65***	-0.47**	0.65***	-0.7***	-0.5***	-0.81***	-0.33*	0.8***	-0.17*	1.0				
	Services	Export	0.21*	0.64***	-0.33*	-0.2*	0*	0.06*	0.06*	0.83***	0.08*	0.83***	0.08*	0.27*	-0.13*	0.14*	-0.39**	-0.14*	0.09*	-0.3*	0.3*	0.14*	1.0		
	Import	Import	-0.19*	-0.16*	0.08*	-0.58***	0.45**	-0.31*	-0.29*	-0.41**	0.15*	-0.54***	-0.4**	0.57***	-0.61***	-0.4	-0.73***	-0.41**	0.82***	-0.33*	0.96***	-0.04*	1.0		
	CAB	Balance	-0.44**	-0.4	0.68***	-0.71***	0.05*	-0.16*	0.41**	0.14*	0.27*	-0.62***	0.09*	0.54**	-0.66***	-0.26*	-0.57***	0.59***	0.07*	0.45**	0.4	0.18*	0.27*	1.0	
			-0.24*	-0.3	0.15*	-0.5***	0.39**	-0.24*	-0.28*	-0.4**	-0.17*	-0.56***	-0.53***	0.6***	-0.65***	-0.21*	-0.63***	-0.44**	0.89***	-0.39**	0.84***	-0.39**	0.93***	0.15*	1.0

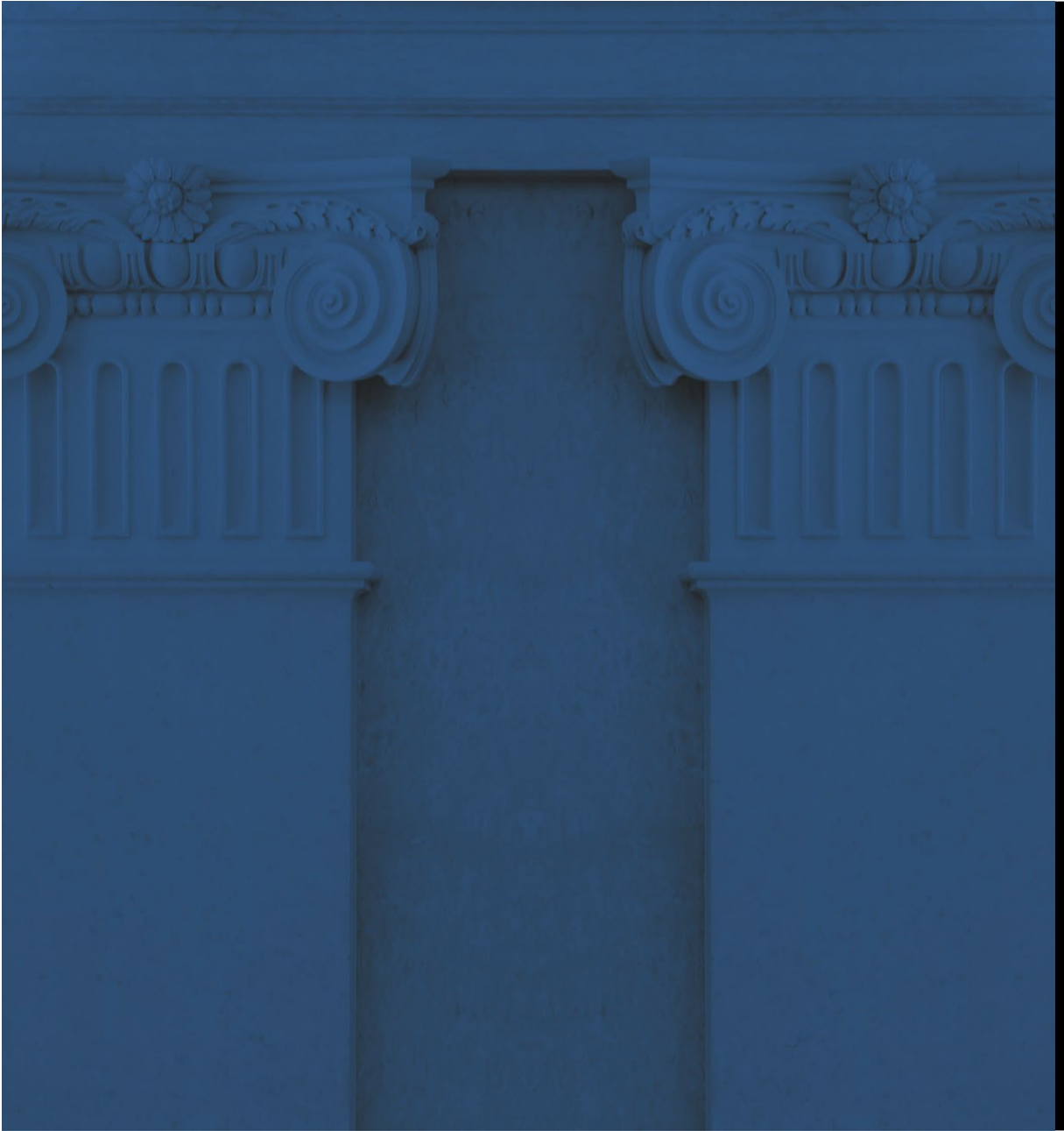
Figure 2- Correlation matrices with statistical significance, for the period 2008Q1-2013Q4.

			Assets									Liabilities									Trade variables				
			Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Public	Public	Public	Bank	Bank	Bank	Company	Company	Company	Goods		Services		CAB
			PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	PI	DI	OI	Export	Import	Export	Import	Balance
Assets	Public	PI	1.0																						
	Public	DI	-0.06*	1.0																					
	Public	OI	-0.63***	-0.32*	1.0																				
	Bank	PI	0.43**	-0.12*	-0.4	1.0																			
	Bank	DI	0.12*	-0.07*	0.28*	-0.11*	1.0																		
	Bank	OI	0.28*	0.25*	-0.22*	0.2*	-0.24*	1.0																	
	Company	PI	0.4	-0.21*	0.09*	0.15*	0.75***	-0.49***	1.0																
	Company	DI	0.03*	-0.03*	0.07*	0.22*	-0.49***	0.47**	-0.33*	1.0															
	Company	OI	-0.43**	0.32*	0.32*	-0.5***	0.39**	-0.03*	0.01*	-0.44**	1.0														
Liabilities	Public	PI	0.09*	0.52***	-0.13*	0.43**	-0.09*	0.63***	-0.31*	0.13*	0.1*	1.0													
	Public	DI	0.75***	-0.18*	-0.52***	0.76***	0.24*	0.18*	0.44**	0*	-0.44**	0.22*	1.0												
	Public	OI	-0.4	0.23*	0.57***	-0.18*	0.59***	0.14*	0.21*	0*	0.66***	0.24*	-0.24*	1.0											
	Bank	PI	0.29*	-0.02*	-0.07*	0.73***	0.05*	0.28*	0.27*	0.4	-0.33*	0.4	0.59***	0.16*	1.0										
	Bank	DI	-0.47**	0.09*	0.56***	0.12*	0.26*	0.27*	-0.06*	0.33*	0.4	0.4	-0.16*	0.84***	0.4	1.0									
	Bank	OI	0.4	-0.07*	-0.48**	0.19*	-0.51***	0.65***	-0.52***	0.4**	-0.3*	0.18*	0.22*	-0.41**	-0.12*	-0.23*	1.0								
	Company	PI	-0.3	0.4	0.12*	-0.13*	-0.58***	0.25*	-0.6***	0.28*	-0.08*	0.4	-0.49**	-0.02*	-0.07*	0.06*	0.06*	1.0							
	Company	DI	0.86***	-0.2*	-0.58***	0.33*	0.17*	-0.05*	0.45**	-0.21*	-0.45**	-0.13*	0.72***	-0.54***	0.14*	-0.68***	0.21*	-0.45**	1.0						
	Company	OI	0.58***	0.15*	-0.44**	-0.28*	0.06*	-0.02*	0.32*	-0.11*	-0.12*	-0.3*	0.12*	-0.26*	-0.09*	-0.6***	0.03*	-0.03*	0.51***	1.0					
Trade variables	Goods	Export	0.89***	0.09*	-0.75***	0.4	-0.19*	0.47**	0.03*	0.19*	-0.43**	0.2*	0.64***	-0.47**	0.19*	-0.53***	0.64***	-0.09*	0.74***	0.55***	1.0				
	Services	Export	0.89***	0.11*	-0.75***	0.4	-0.18*	0.51***	0.02*	0.2*	-0.43**	0.24*	0.64***	-0.44**	0.2*	-0.49***	0.64***	-0.06*	0.72***	0.54***	1***	1.0			
	Import	Import	0.92***	0.02*	-0.73***	0.4	-0.18*	0.45**	0.07*	0.21*	-0.49***	0.16*	0.66***	-0.49***	0.22*	-0.54***	0.62***	-0.1*	0.76***	0.58***	0.99***	0.99***	1.0		
	CAB	Balance	0.89***	0.03*	-0.68***	0.29*	-0.22*	0.48**	0.02*	0.25*	-0.48**	0.16*	0.56***	-0.47**	0.15*	-0.54***	0.64***	-0.01*	0.71***	0.61***	0.98***	0.98***	0.99***	1.0	
			0.19*	-0.4	0.08*	0.45**	0.63***	-0.32*	0.69***	-0.28*	0.03*	-0.12*	0.55***	0.22*	0.44**	0.22*	-0.4	-0.75***	0.28*	-0.26*	-0.14*	-0.15*	-0.11*	-0.22*	1.0

Figure 3- Correlation matrices with statistical significance, for the period 2014Q1-2019Q4.

			Assets										Liabilities										Trade variables																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
			Public		Public		Public		Bank		Bank		Company		Company		Company		Public		Public		Public		Bank		Bank		Bank		Company		Company		Company		Goods		Services		CAB																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
			PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	PI	DI	Export	Import	Export	Import	Balance																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Figure 4- Correlation matrices with statistical significance, for the period 2020Q1-2023Q4.



NEW DATA: DIGGING INTO THE NET-INFLOW ANALYSIS WITH THE REST OF THE WORLD

22 AND 23 AUGUST 2024 | BASEL

12TH IFC BIENNIAL CONFERENCE 2024

GONÇALO AMADO



BANCO DE
PORTUGAL
EUROSISTEMA



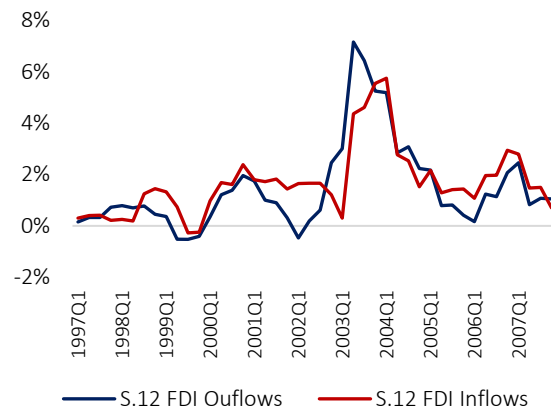
MOTIVATION

- ❑ The economic analysis does not provide numerical benchmarks for determining **what is a 'good' current account balance** (Milesi-Ferretti and Blanchard 2009).
- ❑ The net values of the financial account, translated by its balance, **hide financial phenomena** that can only be perceived by separating assets and liabilities (Obstfeld 2012).
- ❑ Some authors have explored the relevance of gross capital flows (Forbes and Warnock 2012, Broner et al. 2013, Pérez 2019). A country may maintain **relatively stable** external balances while concealing **potentially destabilizing** gross capital flows (Kohler 2022, 2023).
- ❑ The examination of gross external capital flows by instrument, functional category, or sector is frequently **overlooked** (some exceptions: Borio and Disyatat 2011, Avdjiev et al. 2018).
- ❑ ***What do these flows mean for the Portuguese economy?*** A pioneering approach that combines external statistics with quarterly financial accounts, using data from Banco de Portugal.

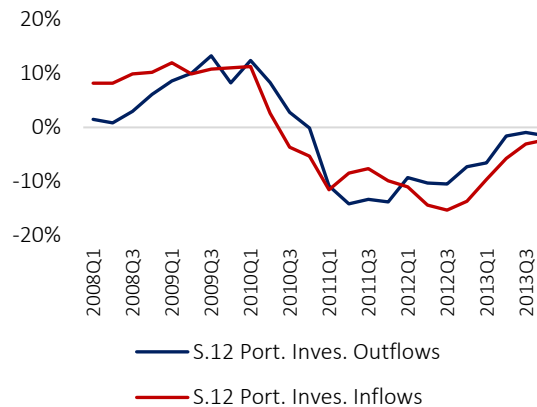


STYLIZED FACT 1: GROSS CAPITAL FOREIGN INFLOWS AND OUTFLOWS BY FINANCIAL CORPORATIONS ARE CORRELATED.

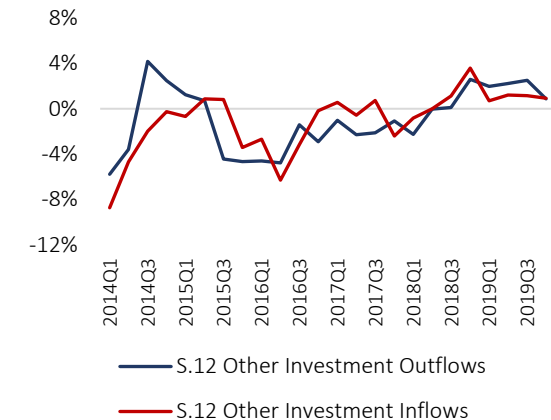
- Considering external statistics by functional category and sector, correlation matrices were built for different periods, allowing the identification of **three stylized facts**.
- There are examples of correlations between **capital inflows and outflows** by financial corporations (including Central Bank) towards the rest-of-the-world. The key to understanding the process of capital outflows and inflows involves this sector.



Total amount of **FDI** gross inflows and outflows from financial corporations, **1996Q4-2007Q4** (4-quarters moving sum, % GDP). Correl.: **0.85*****.



Total amount of **portfolio investment** gross inflows and outflows from financial corporations, **2008Q1-2013Q4** (4-quarters moving sum, % GDP). Correl.: **0.88*****.



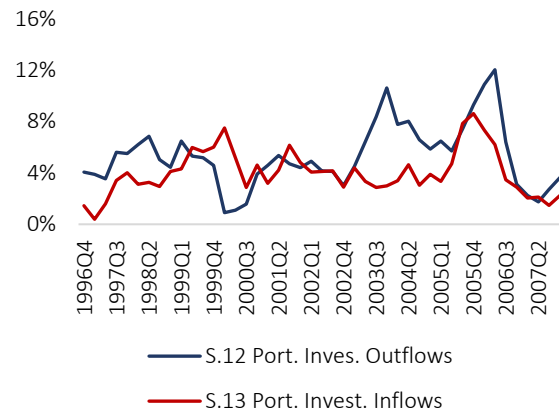
Total amount of **other investment** gross inflows and outflows from financial corporations, **2014Q1-2019Q4** (4-quarters moving sum, % GDP). Correl.: **0.65*****.

Source: author's calculations on Banco de Portugal (BPstat) database.

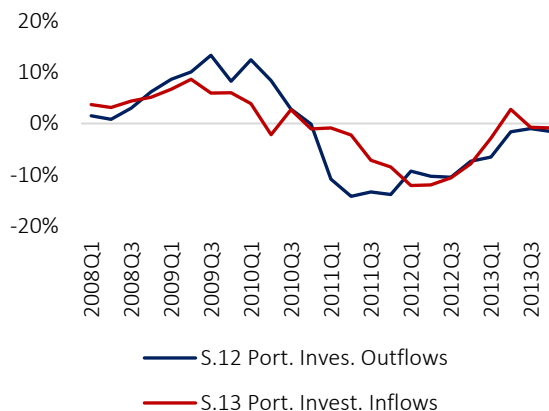


STYLIZED FACT 2: GROSS CAPITAL INFLOWS ON PORTFOLIO INVESTMENT FROM THE GOVERNMENT AND OUTFLOWS FROM THE FINANCIAL SECTOR ARE CORRELATED.

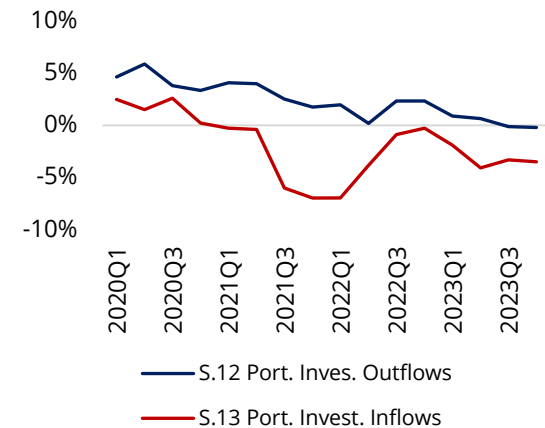
□ These correlations highlight **distinct approaches** of the government and the financial sector towards financial markets.



Total amount of **portfolio investment** gross inflows and outflows from government and financial corporations, respectively, **1996Q4-2007Q4** (4-quarters moving sum, % GDP). Correl.: **0.54****



Total amount of **portfolio investment** gross inflows and outflows from government and financial corporations, respectively, **2008Q1-2013Q4** (4-quarters moving sum, % GDP). Correl.: **0.81*****



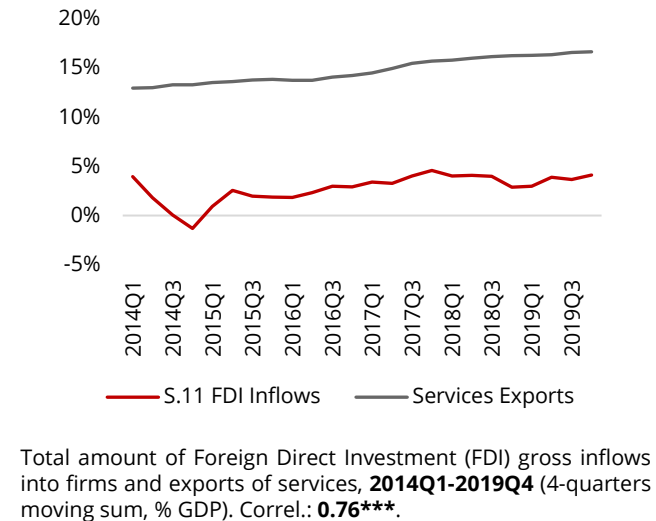
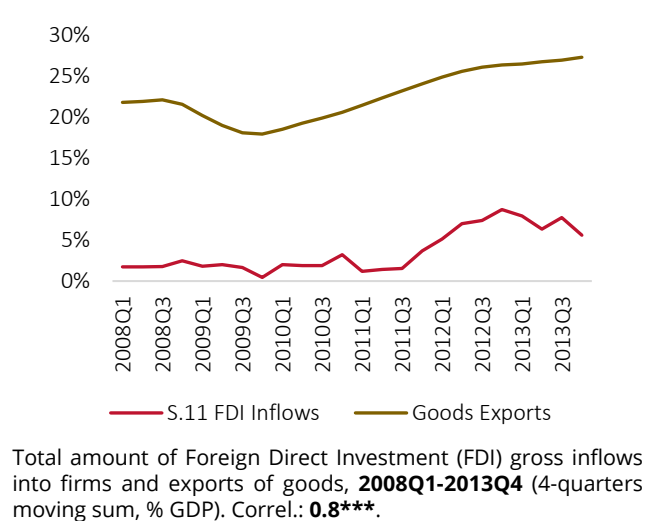
Total amount of **portfolio investment** gross inflows and outflows from government and financial corporations, respectively, **2020Q1-2023Q4** (4-quarters moving sum, % GDP). Correl.: **0.71*****

Source: author's calculations on Banco de Portugal (BPstat) database.



STYLIZED FACT 3: TRADE FLOWS HAVE SMALL CORRELATION WITH GROSS FINANCIAL FLOWS.

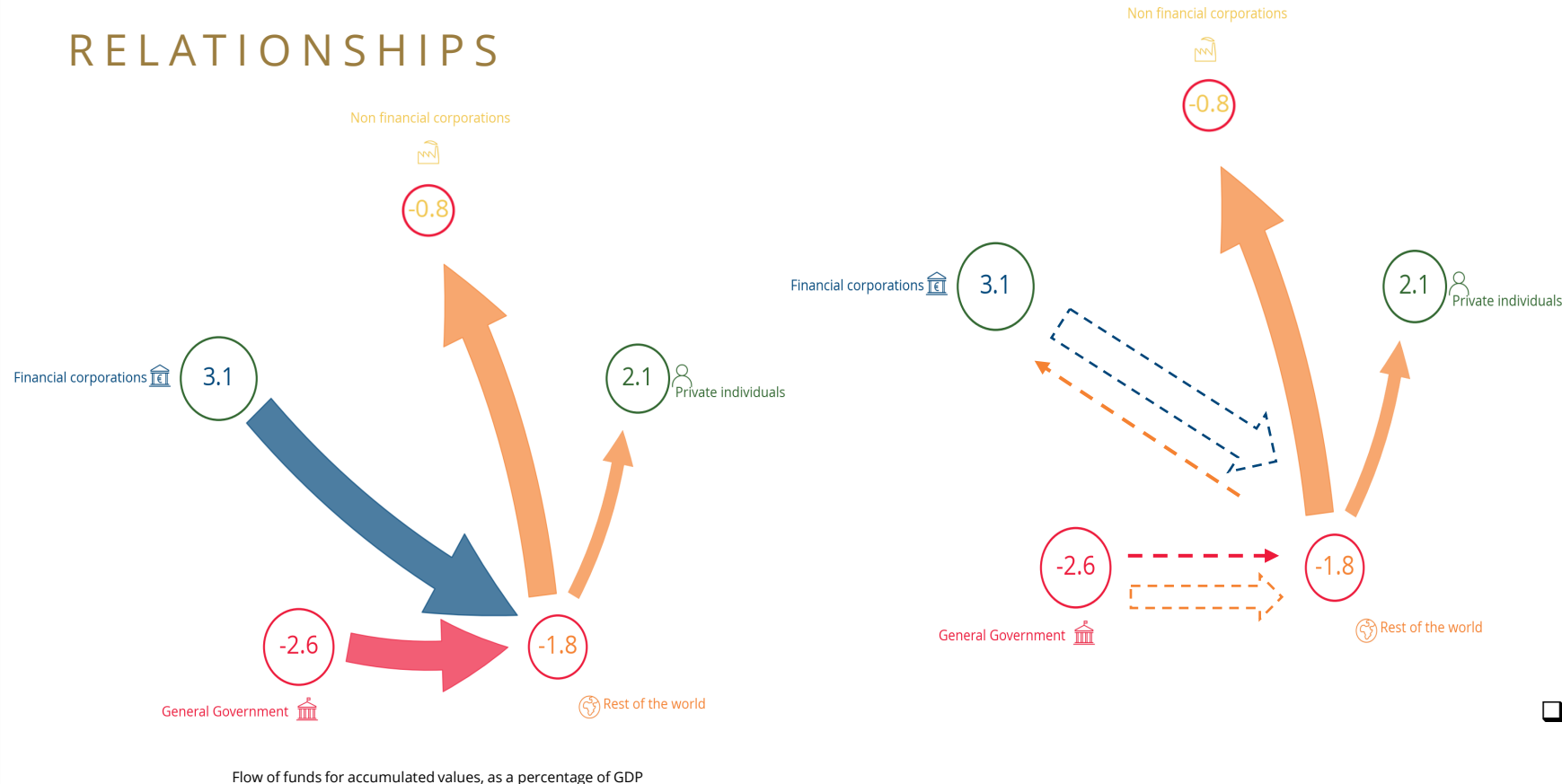
- ❑ *Small correlation between gross financial flows and exports and imports of goods and services and the current account balance. This finding reinforces the argument that there are **capital flows that are quite independent of the current account activity** and are invisible if the analysis is based on net capital flows (Pérez 2019).*
- ❑ **Exceptions:** *strong and significant correlations between exports of goods and services and FDI inflows into firms after the GFC.*



Source: author's calculations on Banco de Portugal (BPstat) database.



2014-2019: FROM A NET-INFLOW ANALYSIS TO GROSS FLOW RELATIONSHIPS



Source: author's calculations on Banco de Portugal (BPstat) database.

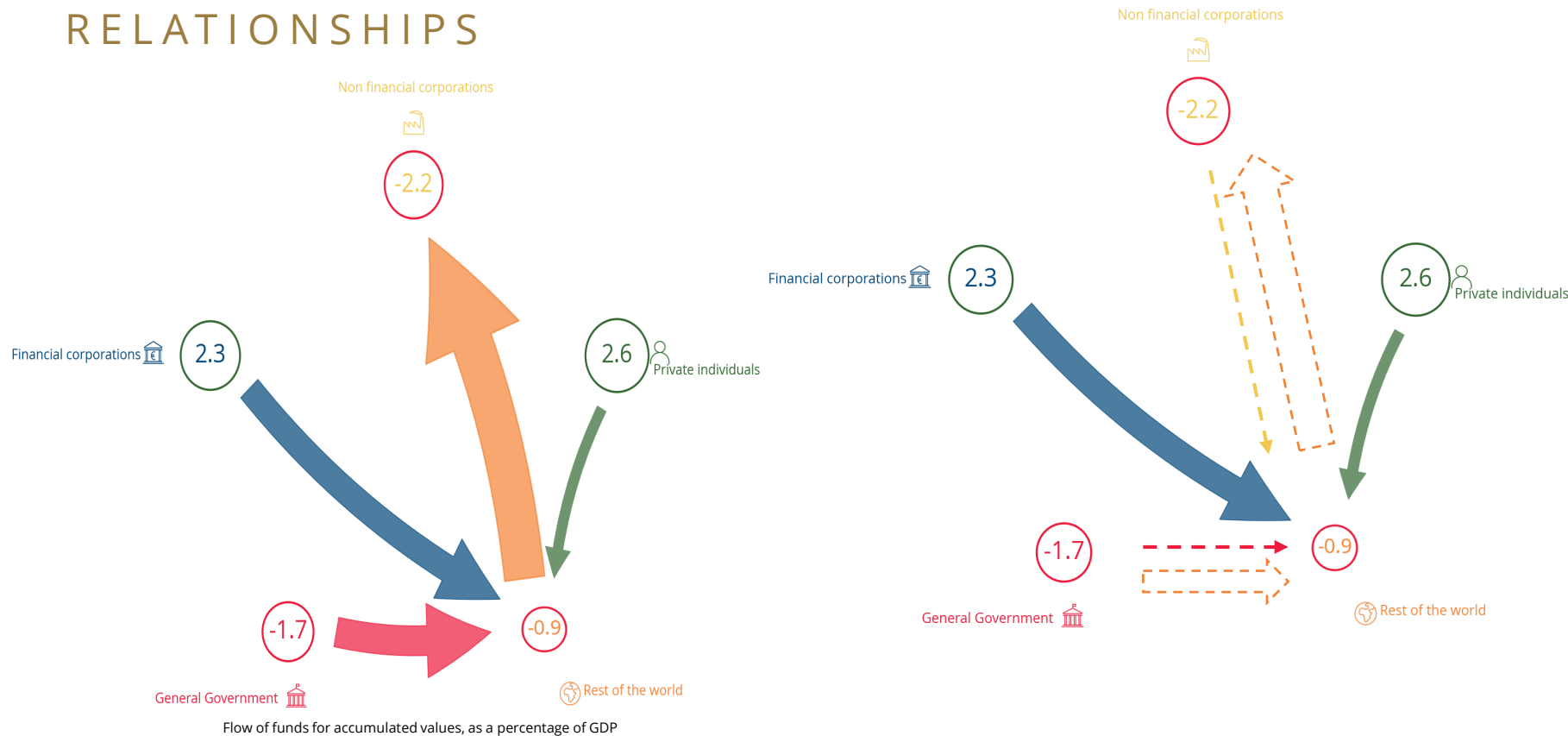
□ The flow of funds allows us to analyze the **balancing item** for each sector and for the total economy vis-à-vis the rest of the world.

□ But we can **go further than a net-inflow analysis**: the detail instrument-by-instrument and sector-by-sector allows the split between assets and liabilities resulting in gross flows.

□ Even when an institutional sector is in a **net borrowing situation**, it can **finance other sectors in gross terms**, a phenomenon not readily apparent in traditional flow of funds analysis.



2020-2023: FROM A NET-INFLOW ANALYSIS TO GROSS FLOW RELATIONSHIPS



- ❑ Two similar net flows can tell **different stories**.
- ❑ The government is **making more investments** abroad than it is receiving in returns from existing assets.
- ❑ Moreover, Government is **decreasing its liabilities** and repaying a greater portion of its existing debt to foreign entities (in form of **securities**).
- ❑ A net flow can hide gross financial flows in **opposite directions**.

Source: author's calculations on Banco de Portugal (BPstat) database.



WHY DIVE INTO THE GROSS CAPITAL FLOWS?

- ❑ Capital flows pose complexity in analysis for both users and policymakers, who **often prioritize examining net flows**.
- ❑ Delving deeply into the balance of payments data and quarterly financial accounts released by the **Portuguese central bank** provides us new insights into gross capital flows, **going beyond the mainstream analysis based on net flows**. These data are compiled and disseminated by national central banks, highlighting their relevance to this audience.
- ❑ Financial corporations played the role **of drivers of financial flows** with foreign countries; the public sector had a **counterbalancing role** to the actions of banks in financial terms; gross capital flows largely operate **independently of trade flows** and the current account balance.
- ❑ Financial interactions among sectors can undergo **substantial changes**, even as the net lending/net borrowing of the total economy **remains relatively stable**.
- ❑ For macroeconomic purposes, when one sector provides net financing to another, it is essential to distinguish whether this net investment manifests as **an increase of gross assets or a diminishment of gross liabilities**. One sector receiving net financing from another, is not excluded from providing financing to other sectors in gross terms.