Appendix — Base Definitions

Total financial assets. TFA are economic assets, comprising all financial claims, equity and the gold bullion component of monetary gold. Liabilities are established when debtors are obliged to provide a payment or a series of payments to creditors (see ESA2010 for details).

Gross domestic product. GDP is the final result of the production activity of resident producer units measured at market prices (see ESA2010).

Property income receivable. PIR is the sum of income receivable by non-financial corporations as owners of a financial asset or a tangible non-produced asset. It consists of interest, the distributed income of corporations (i.e. dividends and withdrawals from income of quasi-corporations), reinvested earnings on direct foreign investment, property income attributed to insurance policy holders, and rent (see OECD's glossary on economic statistics).

Gross entrepreneurial income. GEI is instead the sum of PIR and the operating surplus of the Non-Financial Corporations.

Exposures. The exposures presented in Figure 4 are only those exposures allocation for which data are available: they include equity holdings, bonds, loans, insurance & pension scheme guarantees to the Euro institutional sectors and as a residual, exposure to the rest of the world.

Appendix — Data, Methods and Additional Figures

1. Data

In our study, we use classification of the institutional sectors of the Euro Area provided by the ECB Data Warehouse: non-financial corporations (e.g. NFC, firms), investment funds (IF), monetary financial institutions or banks (MFI), other financial institutions (OFI), insurance and pension funds (I&PF), governments (Gov) and households (HH) .

1.1. Data used in computation of financialization indices

For calculation of the financialization indices, for the countries we used neither seasonally nor working day adjusted data (the only data available). Euro Area 19 comprises 19 countries. All data used in this study are taken at market prices.

1.2. Data used for the exposure reconstruction

Data on financial exposures among the institutional sectors listed above (often referred to as "who-to-whom" data) was used for calculation of table 2 and figure 3 and have been obtained from the ECB Data Warehouse. These data sets contain information on financial exposures among the institutional sectors of the Euro Area (19 countries) and so-called "Rest-of-the-world", without specification of the institutional sector. Exposures are presented for the four major financial instruments: equity, bonds, loans and insurance&pension schemes guarantees. The longest in time (1999Q1 - 2016Q3) and more detailed information is collected for loans and include short-term loans (with maturity of one year), long-term loans (with maturity of more than a year) and deposits. In case of bonds exposures, the data set contains information for short-term bonds (maturity up to one year) and long-term bonds (maturity more than one year). These data sets cover a shorter time period: 2013Q4 - 2016Q3. For equity holdings, the information is available for listed equity shares and for investment fund shares, covering the time period 2013Q4 - 2016Q3. Since the data on exposures between the institutional sectors of the Euro Area is not available for unlisted companies, and as unlisted companies represent a significant portion of assets of some of the institutional sectors, we reconstructed these data by assuming that exposures of institutional sectors through unlisted companies are proportional to their exposure via listed companies. Allocation of assets through other than four listed above instruments can not be determined due to data unavailability (exposure to the rest-of-the-world) is presented separately in Table A1 (see below) and these assets are not taken into account in Figure 3 of this Policy Brief.

2. Methods.

2.1. Calculation of the measures of financialization of the Euro Area economy.

2.1.1. Global measure of Euro Area financialization

The term financialization is usually used to describe the increased importance of financial activities, incomes, and profits of the economy (see Krippner 2005, Assa 2016). In order to capture the financialization of the Euro Area economy we looked at one of the standard indicators of financialization (Assa 2012, Kedrosky and Stangler, 2011): the ratio between the total financial assets over the GDP. The results are presented on Figure 1 in the main text of the Policy Brief. This analysis was performed for the Euro Area 19 as a whole, and for selected European countries: Austria, Belgium, Germany, United Kingdom, Italy, the Netherlands and France.

Another interesting and representative measure of financialization of the EA economy is the ratio of the total financial assets over the total assets for the EA economy and chosen countries. However, unfortunately, there are no existing data for the total assets (including non-financial) at both EA level and national level. Accordingly, this measure cannot be used at the moment due to the lack of data. Important to note, that data availability on the total assets at the national accounts level is crucial for the understanding of the trends and mechanisms of financialization of the Euro Area economy.

2.1.2. Measures of non-financial corporations financialization in the Euro Area

To understand the patterns of financialization of the Euro Area economy it is important to distinguish between the financialization of institutional sectors such as non-financial corporations (NFC) and financial corporations (FC). In Stolbova et al., 2017, we propose several measures to capture the financialization of the non-financial corporations:
1. The ratio of the property income receivable (from the ownership of financial or tangible non-produced assets) to total income (the sum of property income receivable and entrepreneurial income) see Figure 2.
2. The ratio of the total financial assets of NFC to fixed assets of NFC.
3. The ratio of the total financial assets of NFC to gross value added of NFC.
4. The ratio of the gross value added (GVA) of NFC to total gross value added.

For the sake of clarity, in this Policy Brief we consider the first of the listed above ratios, as it is also the most representative one. We also consider the ratio 2., in order to compare the financialization of the non-financial corporations with financialization of financial corporations.

2.1.3. Measures of Financial Corporations (FC) financialization in the Euro Area

Financialization of the Financial Corporations can be measured with the following measures:
1. The ratio of the gross value added (GVA) of FC to total gross value added.
2. The ratio of the total financial assets of FC to gross value added of FC.
3. The ratio of the total financial assets of FC to fixed assets of FC.

In this Policy Brief, we focus on the last ratio for the comparison of financialization of the financial corporations with non-financial corporations.

3. Financial assets allocation of the Euro Area institutional sectors and comments on calculation of the Table 2 (see the main text of the Policy Brief).

Table 2 was calculated using aggregation of the Table A1 (see below). Financial sector includes banks, investment funds, insurance&pension funds, while real economy sector includes non-financial corporations, governments and households of the Euro Area. In addition, for the allocation of the rest-of-the-world exposure through equity, bonds, loans and insurance&pension scheme guarantees, we used an assumption that institutional sector allocates their assets outside the Euro Area in a similar way as inside the Euro Area.

Institutional sector	Total assets of the sector (trillion, euros)	Assets (equity, bonds, loans, insurance&pension scheme guarantees) - for which we know allocation (trillion, euros)	The rest assets (total-assets known) for which we do not know their allocation (trillion, euros)	Exposure within Euro Area (trillion, euros)	Exposure to the rest-of-the-world through equity, bonds, loans, insurance&pension scheme guarantees (trillion, euros)	Allocation of these assets is unknown
NFC	21.18	13.96	7.23	12.32	1.64	7.22 (34%) - financial derivatives and other accounts receivable
MFI	32.37	30.65	1.72	26.20	4.45	1.72 (5%) - financial derivatives and other accounts receivable
IF	9.53	9.04	0.48	4.88	4.16	0.49 (5%)- remaining assets&financial derivatives

OFI	19.52	15.63	3.89	11.97	3.66	3.83 (20%)
I&PF	9.20	8.83	0.36	7.28	1.55	0.37 (4%)
Gov	5.00	3.67	1.33	3.32	0.35	1.33 (27%)
HH	22.01	19.97	2.10	19.24	0.73	2.04 (9%)
RoW	-	30.75	-	25.97	-	-

Table A1. *Detailed exposures of the Euro Area institutional sectors to each other and to the rest of the world (RoW).*
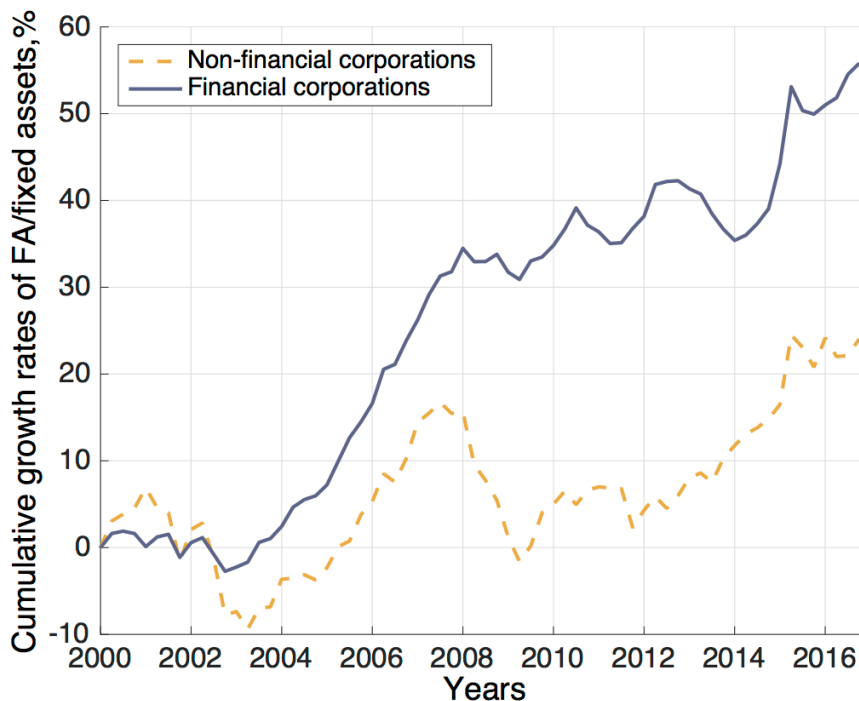
4. Other financialization measures.

Figure A1. *Ratio of Total Financial Assets to Fixed Assets, cumulative growth rate computed as $(FinA/FixA)_t / (FinA/FixA)_{2000}$ - 1. Measured for Financial Corporations (FC, full blue) and for Non-Financial Corporations (NFC, dashed yellow). Source: authors computations based on the ECB Data Warehouse.*

Figure A1 suggests that in the last 16 years, the ratio between FinA and FixA has been increasing in the whole Euro Area, both for Financial and Non-Financial Corporations. In particular, the growth of this ratio in the non-financial sector reveals a shift in the asset side of non-financial firms in favor of financial capital. Also, notice that the Great Recession has

marked a decline in the growth of the ratio of financial assets over fixed ones, especially for non-financial firms. Nevertheless, this ratio has started to increase again since 2010.

Using the ECB data we can also take a look at the financial exposures of institutional sectors' balance sheets. Hence, in Figure 4 we illustrate what portion of the financial assets of each institutional sector in the Euro Area are invested in real sectors (yellow) or in financial sectors (blue).
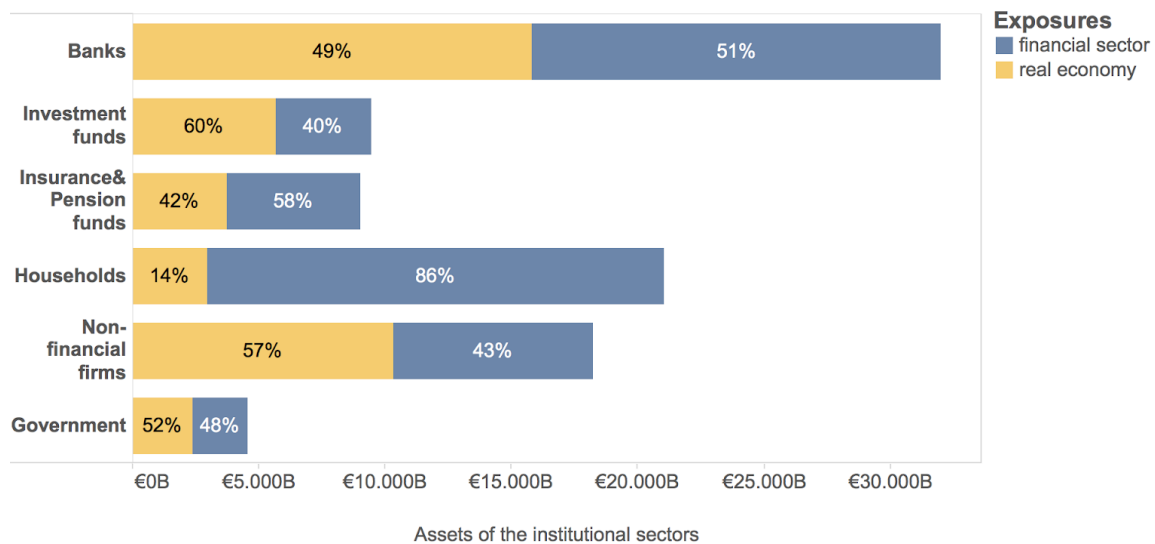

Figure A2. *Snapshot of the Euro Area economy exposures (x-axis) by institutional sectors (y-axis). Exposures have been recollected into the two categories of real (yellow) and financial ones (blue), Q4 2015. Real economy includes non-financial firms, government, households; financial sector includes banks, investment funds, insurance & pension funds. Source: authors computations based on the ECB Data Warehouse.*

Figure A2 shows that the sectors holding the largest exposure to other sectors and to the financial sector in particular are households and banks. This result, which may be surprising to some readers, deserves some comments. Households hold the largest total exposures to other sectors of the economy and the largest exposure to the financial sector (around 80% of its balance sheet). This exposure consists mainly of deposits at commercial banks, but also of insurances and pension schemes guarantees towards the sector of pension funds and insurance. Banks exposures are evenly spread between the financial sector and the real sector.[1] However, the largest portion of the exposure to the real sector consists of loans to households, which finance housing mortgages (see for instance, Jorda et al. 2016). This statistics contributes to challenge the long-held and still pervasive idea that the main activity of banks is intermediation between savers and the real sector. In contrast, the largest exposure of banks is within the financial sector itself, while the second largest exposure finances real estate projects. Both exposures have played a major role in the 2008 financial crisis: the real-estate bubble was fuelled by the availability of credit under poor risk monitoring standards, and the complexity of the web of intra-financial contracts amplified the losses once the bubble had burst.

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[1] Exposures to the real economy are mainly constituted by loans to households and to Non-Financial Corporations, but also to the external sector. The largest fraction (70%) of banks' exposures to the financial sectors is composed by interbank loans (24% of total banks' assets), financial corporate bonds (both from banks and other financial institutions) (8%), and investment fund shares (1%).

4. Financialization effects on Financial Instability

Since the 2008 financial crisis there is growing awareness among both scholars and practitioners of the fact that the financialization of the economy may increase financial instability. For instance, in a 2014 speech, Benoît Cœuré, Member of the Executive Board of the ECB noted that *"[...] there is a link between the size of the financial sector and its complexity. It is likely that the complexity and interconnectedness of financial institutions increases (presumably in a non-linear way) with the size of the overall financial system, making it more difficult for regulators to understand what is going on within its bounds."* Relatedly, starting from 2013, the [EU Capital Requirements Directives CRD IV and CRR](#) have *"introduced remuneration rules for key staff capable of influencing the risk profile of their [financial] institutions"*. Interestingly, the purpose of this regulation is that of limiting excessive risk-taking and aligning staff's incentives with the long-term objectives of firms. However, there is a lack of clarity on the exact mechanisms through which financialization may increase financial instability. Our research in ISIGrowth has contributed to shed light on these mechanisms. From a conceptual point of view, it is important to understand that the main driver of financial instability is not a large exogenous shock hitting the financial system and causing proportionate losses. In contrast, instability has to do with the fact that under certain conditions the financial exposure of financial actors to securities and among actors themselves may act not only as conduits of losses but also as an amplification mechanism of losses. Under these conditions, even small shocks internal to the financial system can turn, endogenously, into disproportionate losses.

In mathematical terms, in an interconnected financial system under a mark-to-market accounting, total losses resulting from a shock have been shown to depend on the structure of the *net leverage matrix* (see Battiston et al. 2016, Visentin et al. 2017, Bardoscia et al. 2017). Indeed, in a system of banks connected in a network of external assets and interbank obligations, what matters for instability is how much the individual banks are exposed, relatively to their capital, both to securities in the market and to other banks. Each exposure, relative to capital, and corrected for its possible recovery rate, constitutes a component of the net leverage matrix. Indeed, contracts among financial firms usually come with some pledged collateral, so that in case of default of the counter-party the actual value of the contract is decreased by a factor (1-Recovery rate). For the sake of simplicity, we can focus on the average effect which has been shown to boil down to this simple formula:

*Total losses = External leverage * (1 + Interbank Leverage * (1-Recovery rate)) * shock,*

where external leverage is defined as the ratio of a bank's exposure to external assets over equity and Interbank leverage is defined as the ratio of a bank's exposure to other banks over equity. Note that in the above formula, if the Recovery rate on interbank obligation is 1, the losses are solely due to the external leverage. If the recovery rate is smaller than one there is an amplification of losses that can be substantial, because the interbank leverage is empirically larger than one (especially for large banks). The original formulation is in terms of matrices and what matters are the largest eigenvalues of these matrices, but the reasoning is essentially the same. This simplified conceptualization does not model explicitly a number of endogenous aspects of systemic risk; yet, it allows to understand in mathematical terms how financialization can contribute to financial instability. Indeed, in the formula above,

financialization can affect both the term Interbank Leverage as well as the term (1-Recovery rate) leading to larger systemic losses, as explained more in detail below.