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Corporate Credit Provision

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Nina Boyarchenko and Philippe Mueller

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Abstract

Productive firms can access credit markets directly by issuing corporate bonds or by borrowing through financial intermediaries. In this paper, we study the cyclical properties of corporate credit provision through these two types of debt instruments in major advanced economies. We argue that the cyclical property of corporate credit is closely related to the cyclical property of the types of financial intermediaries active in the provision of credit. When a debt instrument is held by institutions that manage their balance sheets through debt issuance, credit provision through that instrument is procyclical. But when a debt instrument is held by institutions that manage their balance sheets through equity issuance, credit provision through that instrument is countercyclical. We show that cross-country differences in the cyclical property of corporate credit can be ascribed to differences in the composition of the aggregate financial sector, and not to differences in the balance sheet management practices of each type of financial intermediary.

Key words: intermediated credit, leverage cycles, corporate bonds

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To view the authors' disclosure statements, visit
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1 Introduction

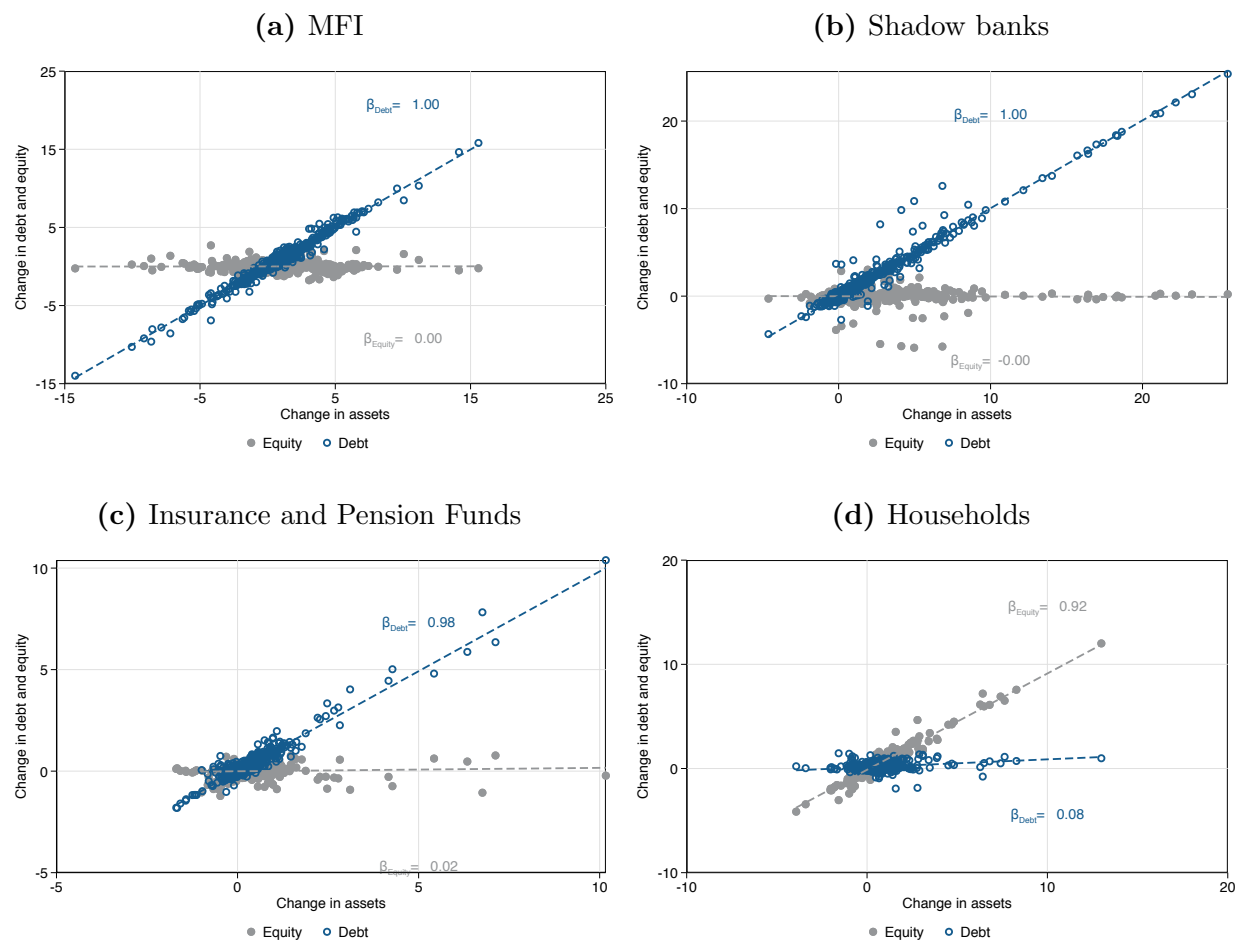
Non-financial corporations across the world have a choice in how they fund their business activities. Traditional pecking order theory (Myers, 1984) postulates that, in financing new investments, corporations would first choose to use internal funds, then raise funding through debt markets, and, as a last resort, raise capital in the equity markets. In this paper, we focus on the sources of debt funding, studying how financial sector demand for non-financial corporate credit over the business cycle shapes both total credit growth and the growth of intermediated credit.

We start with a simple observation: different types of financial institutions have different modes of leveraging up over the business cycle. Figure 1 presents the scatter plot of the year-over-year change in total assets against changes in total debt and total equity, different parts of the financial sector and households across the U. S., U. K., Canada, Japan, and members of the European Union. More precisely, for each (sub)sector, it plots $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta E_t}{C_{t-4}} \right\}$ and $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta L_t}{C_{t-4}} \right\}$, where ΔA_t is the year-over-year change in total assets to quarter t , ΔE_t and ΔL_t are the corresponding changes in equity and debt, respectively, and C_{t-4} is the four quarters lagged nominal GDP.¹ Figure 1a shows that, across countries, the total size of the balance sheet of monetary financial institutions (MFIs) fluctuates through changes in liabilities, with equity being the exogenous variable. For MFIs, the slope of the fitted line $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta L_t}{C_{t-4}} \right\}$ is close to one, so that the year-over-year change in assets is almost entirely accounted for by the change in debt, while the slope of the fitted line $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta E_t}{C_{t-4}} \right\}$ is close to zero, indicating “sticky” equity. Figure 1a is the cross-country counterpart of the finding in Adrian and Shin (2014) of procyclical leverage in the U. S. broker-dealer sector.

In contrast, Figure 1d shows that households expand balance sheets primarily through increases in equity, with debt the (almost) exogenous variable. That is, for households, the slope of the fitted line $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta L_t}{C_{t-4}} \right\}$ is around fifteen percent, indicating relatively “sticky”

¹ We use lagged nominal GDP to standardize the sizes of financial sectors across countries.

Figure 1. Modes of Asset Growth. This figure plots the relationship between year-over-year changes in total assets, total liabilities and total financial equity for the monetary financial institutions (including the monetary authority and central banks) sector (1a), the insurance and pension fund sector (1c), shadow banks (1b), and the household sector (1d). “Shadow banks” refers to all financial institutions that are not MFIs, insurance companies or pension funds. Changes reported as fraction of nominal GDP. Sample: all countries.



debt, and the slope of the fitted line $\left\{ \frac{\Delta A_t}{C_{t-4}}, \frac{\Delta E_t}{C_{t-4}} \right\}$ is close to eighty five percent, so that the year-over-year change in assets is almost entirely accounted for by the change in equity. The other two subsectors plotted in Figure 1—insurance and pension funds as well as shadow banks—are in-between these two extremes, with insurance and pension funds expanding balance sheets at almost equal rates through debt and equity, while shadow banks primarily use debt to grow their assets but with a lower intensity than MFIs do.²

In this paper we argue that, in addition to not using the same mode of growing assets, institutions provide credit to the non-financial corporate sector through different instruments. While MFIs extend credit predominantly through loans, insurance companies and pension funds do so primarily through corporate bonds. Thus, the supply of loans to the corporate sector is supported primarily by the ability of banks and shadow banks in the economy to expand their balance sheets by raising debt, while the supply of corporate bonds is supported primarily by the ability of insurance companies, pension funds, and households to expand their balance sheets by raising equity.

We begin by documenting the cyclical properties of financial business balance sheets and equilibrium supply of loans to corporate business, corporate bonds and total credit to corporate business across large advanced economies – U. S., U. K., Canada, Japan, Australia, Norway and E. U.-member countries. While the financial business sector is procyclical across all of these economies and appears to manage its balance sheet size through debt issuance, so that expansions of the total assets of the financial business sector are financed primarily through expansions of liabilities of the financial business sector, the cyclicity of credit provision through corporate bonds varies. This leads the sensitivity of both total credit provided and intermediated credit provided to the business cycle to vary cross-country.

So what drives cross-country differences in the cyclicity of credit provision to the non-

² We use “shadow banks” as short-hand for all financial institutions that are neither MFIs nor insurance companies nor pension funds. For example, in the U. S., this includes money market mutual funds, mutual funds, real estate investment trusts, and finance companies.

financial corporate sector? We document that, while different parts of the aggregate financial sector make similar credit provision decisions in all countries, the relative prominence of financial system subsectors differs across countries and fluctuates at business cycle frequency. That is, in each country in our sample, the banking sector provides credit primarily through loans, the insurance and pension fund and household sectors provide credit primarily through corporate bonds, and the shadow bank sector provides credit through a mix of both debt instruments. Moreover, in each country in our sample, the banking and shadow banking sectors expand their balance sheets primarily through expanding their liabilities, the household sector primarily through expanding its equity, and the insurance and pension fund sector through a mix of liabilities and equity. Thus, at the financial institution type level, the countries in our sample look similar, despite inherent differences across jurisdictions, such as public institutions, regulatory environment, and historical experiences. Instead, these inherent cross-country differences translate into the differential composition of the aggregate financial sector.

This paper is related to the literature on the cyclicity of bank balance sheets. Adrian and Shin (2010, 2014); Adrian, Boyarchenko, and Shin (2015) document that the U. S. broker-dealer sector and the banking sector more generally in the U. S. has procyclical leverage, managing the size of their balance sheets through debt issuance to target a constant trend-growth rate of equity. These aggregate banking sector results have also been confirmed using individual bank data in the U. S. in Beccalli, Boitani, and Di Giuliantonio (2015), in Europe in Baglioni, Beccalli, Boitani, and Monticini (2013), and in Canada in Damar, Meh, and Terajima (2013). Adrian and Shin (2014) also document that the share of intermediated credit is procyclical: the banking sector accounts for a bigger fraction of the total credit extended to the non-financial sector during expansions. Herman, Igan, and Solé (2017) confirms the differential cyclical behavior of bank and non-bank credit in relation to the long-term business cycle, as well as recessions, recoveries and systemic financial crises. This paper contributes to this literature by documenting that the banking sectors across the different countries in

our sample manage the size of their balance sheets through debt issuance. Whether the ensuing procyclicality of bank leverage translates into procyclicality of intermediated credit depends on the importance of the banking sector within the overall financial system. Thus, credit provision through the banking sector is not a sufficient statistic for the state of the credit cycle.

Moving to the international context, Naceur, Marton, and Roulet (2018) show that bank credit provision is more cyclical in economies where bank competition is weak. Focusing on bank profitability over the business cycle, rather than the composition of bank balance sheets, Albertazzi and Gambacorta (2009) show that the banking systems in Anglo-Saxon countries are more resilient than those in their Euro-area counterparts, and relate the differential resiliency to the characteristics of their financial structure. Shin and Shin (2011) show that, since banks borrow to finance extensions of credit, the relative prominence of non-core liabilities of the banking sector is informative about the state of the credit cycle. Our paper is complementary to this prior literature in studying the cyclical properties of both bank and non-bank credit provision over the business cycle in an international setting. The closest to our paper, Gambacorta and Shin (2018) use a cross-country bank level panel to show that improvements in bank capital ratios are associated with both a reduction in the cost of debt financing and an increase in annual loan growth.

This paper also speaks to the literature on international corporate credit provision. In a series of papers, Cetorelli and Goldberg (2011, 2012b,a) show that global banks manage liquidity on a global scale, reducing cross-border lending to both the non-financial and financial sectors in response to contractionary domestic shocks. In the same spirit, Avdjiev, Berger, and Shin (2018) present a case study of past episodes of financial stress in Asia, illustrating the cross-border nature of the procyclical risk-taking propensity of financial intermediaries through the composition of liabilities. Avdjiev, Gambacorta, Goldberg, and Schiaffi (2017) show that the composition and drivers of international bank lending and international bond issuance

has changed since the financial crisis, with the responsiveness of international bank lending to global risk conditions declining considerably post-crisis and becoming similar to that of international debt securities. Blanchard, Ostry, Ghosh, and Chamon (2017) argue that the composition of corporate credit also determines whether capital inflows are expansionary or contractionary for a small open economy, with capital inflows through bank lending reducing the overall cost of financing for productive firms. This literature has focused on cross-border credit flows, while our paper focuses on the within-country corporate credit provision by different parts of the financial sector and is thus complementary to these earlier studies.

Finally, this paper is related to the recent literature on balance sheet management by insurance companies. Kojen and Yogo (2015) show that, during the financial crisis, life insurers managed the size of their balance by selling long-term policies at deep discounts relative to actuarial values, exploiting regulation that allowed them to record less than a dollar of reserve per dollar of future insurance liability. At the same time, insurance companies changed the composition of their liabilities by increasing the fees on variable annuities, reducing the sales of such products (Kojen and Yogo, 2018). On the asset composition side, Chodorow-Reich, Ghent, and Haddad (2018) argue that insurance companies act as asset insulators, holding assets for the long-run to protect their equity from fluctuations in market asset values. Extending this intuition, Boyarchenko, Kojen, and Shachar (2019) document that corporate issuers cater to these preferences by fragmenting their overall bond issuances into multiple individual issues and issuing privately-traded debt. Unlike these earlier studies that utilize insurance-company-level balance sheet data, we focus on the cyclical properties of the balance sheet of the aggregate insurance company sector, and how it contrasts with the cyclical properties of the balance sheet of the aggregate bank and shadow bank sectors.

The rest of the paper is organized as follows. We describe the data sources and summarize the main properties of the data in Section 2. Section 3 documents differences in the cyclical properties of the aggregate financial sector across countries. We show that these cross-

country differences in aggregate cyclicalities arise from differences in the composition of the financial business sector in Section 4. Section 5 concludes.

2 Data description

One of the contributions of this paper is to provide stylized facts on the features of corporate credit provision across a range of developed economies. To that end, we collect balance sheet information for the *financial business* sector (and its three subsectors *monetary financial institutions*, *insurance companies and pension funds*, and *shadow banks*), the *non-financial corporate business* sector, and *households* for the United States, the United Kingdom, Japan, Canada, Australia, Norway, and member countries of the European Union from their respective “flow of funds” data. Flow of funds data are national accounts that present an overview of providers and users of financial instruments in the economy. Note that due to reporting requirements the household sector is thought to also include information about hedge funds as they are not contained in any other category. For all the countries in our sample, the flow of funds data is available at the sectoral level for both the asset and the liability side of the balance sheet, which allows to observe at the sectoral level who is borrowing and who is lending using which instruments. As we describe in more detail below, some countries also provide a “who-to-whom” version of national accounts, which directly measures how much funding flows from one sector of the economy to another.

2.1 International flow of funds data

We collect most of our data directly from the respective national sources through their websites. The data across countries differs by granularity as well as time span. While we work with the maximum history possible for each country, we use the coarsest set of

classifications in order to make consistent comparisons across the various countries in our sample. For some countries we are able to extend the time span by adding some data obtained through Haver Analytics. We merge the flow-of-funds data with data on real and nominal GDP collected through Haver Analytics for all the countries in our sample. Not all countries use the same definitions or labels for the sectors we consider. We describe the relevant sectoral definitions in the Data Appendix A.1.

United Kingdom. We start the description of the flow of funds data with the U.K. as it provides the coarsest classification of all the countries considered. The data is from the U.K. Office for National Statistics.³ Given the coarseness, we use the U. K. definitions throughout to have a consistent classification system across the various countries. As a result, we are left with a total of five relevant sectors for data starting in 1987: “private non-financial corporations”, “households and non-profit institutions serving households”, “monetary financial institutions”, “insurance corporations and pension funds”, and “other financial intermediaries and financial auxiliaries”.⁴ The first two sectors are our non-financial corporate business and the household sectors, the latter three taken together make up the financial business sector. In addition, we collect data on “debt securities” and “loans”.

United States. The quarterly flow of funds data for the U.S. starting in 1966 are from the “Financial Accounts of the United States” (Z.1) data release available from the Federal Reserve Board.⁵ We collect the level tables for the three main sectors “nonfinancial corporate business”, “domestic financial sectors” and “households and nonprofit organizations”. For the subsectors we collect the tables for “private depository institutions”, “money market funds”, “security brokers and dealers”, “monetary authority”, “property-casualty insurance companies”, “life insurance companies (general accounts)”, “mutual funds”, “closed-end

³ <https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/datasets/unitedkingdomeconomicaccountsflowoffunds>.

⁴ We exclude the following four sectors from our analysis: “public non-financial corporations”, “central government”, “local government”, and “rest of the world” but these sectors are included in the information for the total economy.

⁵ See <https://www.federalreserve.gov/apps/fof/>.

funds”, “issuers of asset-backed securities”, and “real estate investment trusts”.⁶ In addition, use data on “corporate and foreign bonds”, “loans”, “depository institution loans not elsewhere classified”, and “other loans and advances”.

Euro area and other EU member states. Data for the euro area countries and other EU member states is available through the Statistical Data Warehouse of the ECB starting in 1999.⁷ The European Union uses the European System of Accounts (ESA 2010, see also Eurostat, 2013), which is broadly consistent with the United Nations System of National Accounts (2008 SNA, see United Nations, 2009) that allows to construct the same categories we use for the U. K. data set. Furthermore, we extend our European data set in the time series using data from Haver Analytics that is organized based on the older European System of Accounts (ESA 1995, see Eurostat, 1996). This allows us to start as early as 1991 for example in the case of Germany.

Japan. We collect quarterly flow of funds data from the Bank of Japan starting in 1997.⁸ The Bank of Japan follows the System of National Accounts when compiling the flow-of-funds data, using the 2008 SNA. This again allows us to match the categories determined by the availability of the U. K. data.

Canada. The quarterly data for Canada is available from Statistics Canada starting in 1990.⁹ The Capital and Financial Flow Accounts are part of the Canadian System of Macroeconomic Accounts and are produced using the 2008 SNA as well, again allowing for an aggregation that matches the U. K. data and makes the accounts comparable internationally.

Australia. The quarterly data for Australia is available from the Australian Bureau of

⁶ The definitions for the subsectors are described in the Data Appendix A.1.

⁷ See <http://sdw.ecb.europa.eu/browse.do?node=9691132>. Although the U. K. is one of the listed countries the relevant data is missing in the ECB data base. From the available countries we drop Hungary, Czech Republic and Lithuania due to bad data quality. For further information and different uses of flow of funds statistics in the euro area see also Duc and Breton, 2009.

⁸ Flow of funds statistics and explanations can be found on the statistics website (<https://www.boj.or.jp/en/statistics/sj/index.htm/>), the time series are downloaded through the BoJ time-series data search.

⁹ See, <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=1804>.

Statistics starting in 1988, reported using the 2008 SNA in line with most other countries.¹⁰

2.2 Sample summary statistics

Overall, we have information on the financial side of the balance sheet for a large number of countries and quarterly data starting between 1966 (for the U.S.) and 1997 (for Japan) and ending in 2018. Panels (a), (c) and (e) in Table 1 display the median sizes of the three main sectors we consider, i.e., non-financial corporate business (NFCB), households (HH) and financial business (FB), respectively. Panels (b), (d) and (f) show the three subsectors of the FB sector, i.e., monetary financial institutions (MFIs), insurance companies & pension funds (I&P), and shadow banks (SB), respectively. Throughout the table we show all numbers as multiples of GDP in nominal terms for the U.S., Canada, Australia, Japan, the United Kingdom, Germany, France, Italy, Spain and the other European countries bunched together. We also show the median sizes for the whole sample in the time-series as well as the cross-section on the last row (Total) in the respective panels. For all sectors, countries and categories, the maximum number is displayed below the median in parenthesis. Equity is the difference between assets and liabilities and credit instruments are the sum of loans and debt instruments. As we display medians in the table, the numbers do not necessarily add up country by country. In addition, the total is not necessarily equal to the average across the different countries.

For the NFCB sector, the credit instruments are part of the liability side of the financial balance sheet, whereas for the HH and the FB sectors we report the holdings of the respective instruments on the asset side of the financial balance sheet. This obviously doesn't mean that loans and debt instruments should add up to assets or liabilities, respectively. For the NFCB sector, the liability side for example also includes mortgages, trade payables, foreign

¹⁰ See, <http://www.abs.gov.au/AUSSTATS>.

direct investment and miscellaneous liabilities among other items that we do not include in our analysis.

Overall, the financial liabilities of the non-financial corporate business sector are almost 10 times GDP and nearly twice as large as the financial assets, leading to negative median financial equity for all countries in our sample. However, it is worth noting that we only consider the financial balance sheet and do not take into account non-financial assets on the balance sheets of non-financial corporate businesses such as property, plant and equipment. On the liability side, loans are usually more important than debt instruments with the exception of the U.S. where the size is around 70% of GDP for both. For the other countries the medians for loans are roughly between 2 and 4 whereas the median for debt instruments is usually below 0.7 times GDP. Overall, the U.S. also has the lowest media for credit instruments with just 1.44 times GDP and credit instruments account for roughly a third to one half of financial liabilities in relation to GDP.

Unlike the NFCBs, the overall size of household's financial assets are around 7 to 11 times GDP and exceed the financial liabilities by a factor of roughly 3, leading to substantial positive equity. This is not very suprising as the size of households' non-financial assets is much smaller on average compared to NFCBs. In terms of asset holdings, the size of credit instruments held by households rarely exceeds 5% of GDP, again with the exception of the U.S. with the highest median at 10%. Not very surprisingly, most of the credit instruments are due to holdings of debt instruments whereas loan holdings by households are almost negligibly small.

Finally, the financial assets and liabilities of the financial business sector almost balance out on average with medians between 10 for the U.S. and almost 25 for the U.K. and Japan. This leads to numbers of financial equity that are very close to zero and rarely exceed 20% of GDP (with the exception of Australia with a median of -60% and Canada and the U.S. with 57% and 36% , respectively). Not very surprisingly, the FB sector holds most of the

credit instruments with median numbers between 0.9 (for the U.S.) and 3.5 (for Japan) times GDP. In line with the overall FB sector, the financial equity of all three subsectors is very close to zero for all countries although distributions seem a bit more extreme (for example for SB, the financial equity ranges from -0.5 times GDP for the U.K. to 0.8 times GDP for Canada), indicating that the subsectors within a country may absorb swings in the aggregate financial equity. In the U.S. MFIs and I&Ps roughly have the same size of financial balance sheets in relation to GDP and they are about 60% larger than the balance sheet of SBs. In Europe and Japan however, the balance sheet of MFIs is 3 to 4 times as large as the financial balance sheet of I&Ps and often SBs are of similar size or larger than I&Ps.

Not very surprisingly, I&Ps hold only very small amounts of loans, ranging between 0% (for the U.S.) and 16% (for Japan) of GDP. At the same time, their holdings of debt instruments is as large as 34% of GDP for the U.S. (or almost 70% of the total holdings of debt instruments) or roughly 20% to 24% of GDP for the U.K., Canada and France, respectively (i.e., 35% to 63% of total holdings of debt instruments). SBs also hold only a small fraction of total loans with the exception of Canada and Japan where they hold 93% and 114% of GDP, respectively. Consequently, the largest fraction of loans is held by MFIs; in relation to GDP the medians range between 1 (for Canada) and roughly 2 (for Japan) with the U.S. a significant outlier with 33% of GDP held by MFIs (however, MFIs still account for almost 90% of loans held by the FB sector).

In summary, Table 1 documents significant heterogeneity across countries and sectors in terms of financial balance sheets in general and holdings of credit instruments in particular. The NFCB, the FB and the household sectors on average have negative, zero and positive financial equity, respectively. NFCB sector loans are usually magnitudes larger than GDP with the exception of the U.S. At the same time, the NFCB in the U.S. issues a larger fraction of debt securities as a fraction of GDP than most countries in the sample (except Canada and France). In terms of holdings, households only hold a small fraction of debt instruments

and virtually zero loans. Most loans are held by MFIs and SBs (I&Ps only hold a sizeable fraction of loans on their balance sheets in Japan), whereas debt instruments are held by all three subsectors but with significant geographical differences. I.e., I&Ps hold large fractions of debt instruments in the U.S., Canada, Japan and France, whereas SBs have significant holdings of debt instruments in Canada, Australia and the U.S.

3 Aggregate cyclicity

How do balance sheets of the financial and non-financial sectors fluctuate over the business cycle? Figure 2 shows three possible modes of asset growth. In Mode 1 (Figure 2a), institutions expand their balance sheets by issuing equity while keeping debt constant, thereby decreasing their leverage. Figure 1d shows that this mode describes well the way that households and non-profit institutions serving households expand their balance sheets. An alternative approach (Figure 2b) is to expand balance sheets by issuing debt, keeping equity constant, and, thus, increasing leverage. As has been noted in prior literature (see, e.g., Adrian and Shin, 2014), this is the mode that broker-dealers and, more generally, MFIs use to grow assets (see e.g. Adrian, Boyarchenko, and Shin, 2015). Finally, institutions can expand balance sheets by issuing both debt and equity, keeping their leverage roughly constant (Figure 2c), which corresponds to the mode used by insurance companies and pension funds to increase their asset size (Figure 1c). In a frictionless, Modigliani and Miller (1958) world, which mode an institution chooses to grow its balance sheet is immaterial. In this section, we document that the financial business sector in all the countries in our sample also appear to follow Mode 2 (Figure 2b) in managing their balance sheets. We then show that, despite the similarity in how the financial business sector evolves with the business cycle, the cyclical properties of the corporate credit provision differ across countries.

3.1 Cyclicalities of the financial business sector

We begin by studying whether the size of the financial business sector, as measured by total financial assets, is procyclical for the different countries in our sample. More specifically, we estimate

$$\text{Asset growth}_{ct} = \alpha_c + \beta \frac{\Delta \text{GDP}_{ct}}{\text{GDP}_{c,t-4}} + \epsilon_{ct},$$

where we define the asset growth in country c , quarter t as the ratio of the year-over-year change (from quarter $t - 4$ to quarter t) in total assets of the financial system ($\Delta A_{c,t}$) and nominal GDP as of quarter $t - 4$ ($C_{c,t-4}$), and GDP_{ct} is the real GDP in country c , quarter t . The coefficient β measures the elasticity of financial business asset growth to growth in real activity, with positive values of β corresponding to procyclical financial business sectors. Table 2a reports the estimated coefficients β for the full panel of countries, as well as for the subset of the G7 countries, Australia and Spain, the four biggest EU economies (Germany, France, Italy and Spain), the G7 countries individually, and the rest of Europe. The financial business sector is procyclical in the majority of the countries, with a one percentage point increase in real GDP growth translating, on average into a 0.078 point increase in the size of the financial business sector as a fraction of nominal GDP. Amongst the individual countries, total assets of the financial business sector in France react the strongest to growth in economic activity, with a point estimate of 0.3, while total assets of the financial business sector in the UK the least procyclical, with a point estimate of -0.42 (although the coefficient is not statistically significant).

Tables 2b and 2c study how the aggregate financial sector in each country finances this asset growth. Consider first the relationship between growth in liabilities and asset growth

$$\frac{\Delta D_{ct}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{ct} + \epsilon_{ct},$$

where ΔD_{ct} is the year-over-year change in total liabilities of the financial system in country c , quarter t . Table 2b shows that, across all the countries in our sample, total liabilities of the financial sector as a whole grow one-for-one with the total assets of the financial sector. That is, overall, the expansion in assets of the financial system in periods of economic growth is financed primarily through debt, and not equity, issuances.

Indeed, if we estimate the relationship between equity and asset growth

$$\frac{\Delta E_{ct}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{ct} + \epsilon_{ct},$$

where ΔE_{ct} is the year-over-year change in total liabilities of the financial system in country c , quarter t , Table 2c shows that equity growth is only weakly related to asset growth for most countries. On average, a one point increase in total assets of the financial system as a fraction of nominal GDP corresponds to a 0.003 point increase in total equity. Moreover, the explanatory power of asset growth for equity growth is extremely low in most countries, with the adjusted R^2 ranging from -0.014 in the full panel to 0.219 for Japan.

3.2 Cyclicalities of non-financial corporate credit

Similar to assets growing through either debt growth, equity growth or a combination of both, total credit to the non-financial corporate business sector can grow through either growth in loans, growth in debt instruments or a combination of both. The share of intermediated credit – the ratio of credit provided through loans to total credit – can then have different cyclical properties depending on the cyclicalities of the two components of credit.

We begin by studying the relationship between the growth rate of use of different forms of credit (loans, debt instruments, and both) by non-financial corporations and the growth rate

of assets of the financial sector

$$\frac{\Delta \text{Credit}_{ct}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{ct} + \epsilon_{ct}, \quad (1)$$

where $\Delta \text{Credit}_{ct}$ is the year-over-year change in the respective measure of credit. When β is positive, an increase in the total assets of the financial system is associated with an increase in the use of that form of credit by the non-financial corporate sector, and credit use is procyclical. Table 3 shows that that is the case for all countries except Canada, Germany and Italy for credit provision through loans and total credit provision. A one point increase in total asset growth of the financial sector as a fraction of nominal GDP corresponds, on average, to a 0.038 point increase in loans taken out by the non-financial corporate sector and a 0.043 point increase in the total credit used by the non-financial corporate sector.

In contrast, overall, there is no relationship between the issuance of debt instruments by the non-financial corporate sector and the growth rate of assets of the financial sector. The only two exceptions are Australia, where the growth rate of debt instruments issued by the non-financial corporate sector is procyclical but less so than the growth rate of loans taken out by the non-financial corporate sector, and Spain, where the growth rate of debt instruments issued by the non-financial corporate sector is countercyclical.

Turning to the question of whether credit intermediation through the banking sector is procyclical, we estimate the following relationship between the growth in the share of intermediated credit and the growth rate of total assets of the financial business sector

$$\Delta \text{Share intermediated credit}_{ct} = \alpha_c + \beta \text{Asset growth}_{ct} + \epsilon_{ct},$$

where $\text{Share intermediated credit}_{ct}$ is the ratio between total loans taken out by the non-financial corporate sector and the total credit used by the non-financial corporate sector. Table 3d shows that the fraction of intermediated credit is procyclical only in the U. S.,

Australia, France and Spain, with a one point increase in total asset growth of the financial sector as a fraction of nominal GDP corresponding to a 1.23, 0.33, 0.43 and 0.2 percentage point increase in the share of intermediated credit in the U. S., Australia, France and Spain, respectively. That is, for these four countries, credit provision through debt instruments – or, in other words, market-intermediated credit – is sufficiently countercyclical to make the share of credit intermediated through banks procyclical. Notice also that the procyclicality of the share of intermediated credit is so strong in these countries that the panel estimates for the full sample, the sample of G7 countries plus Spain, and the sample of the four biggest European economies also suggest that, on average, the share of intermediated credit is procyclical.

So what drives cross-country differences in the cyclicity of credit provision to the non-financial corporate sector? One possible explanation is that, while different parts of the aggregate financial sector make similar credit provision decisions in all countries, the relative prominence of financial system subsectors differs across countries and fluctuates at business cycle frequency. An alternative explanation is that the financial sectors are inherently different across jurisdictions, because of, for example, differences in public institutions, regulatory environment, and historical experiences. We investigate these alternative hypotheses in the next section.

4 Sectoral credit provision

In this section, we document that institutions that choose different modes of balance sheet growth also choose different modes of credit provision to the non-financial corporate business sector.

4.1 Composition of the financial business sector

We start by investigating the composition of the financial business sector. Figure 3 plots the time series of the total financial business assets represented by monetary financial institutions, insurance and pension funds, and shadow banks, respectively, for nine of the countries in our sample, together with the total financial business assets as a multiple of GDP (right hand scale). In the run-up to the financial crisis, the aggregate financial sector was growing as a fraction of nominal GDP for all countries but financial sector growth has stagnated in the post-crisis period for the U. S. and the European countries. The figure also shows that, as the aggregate financial sector grew across the different economies, the share of traditional banks in the financial sector has declined (except for Japan), while the share of the shadow banking sector has increased over time. In Japan, as well as the European countries, MFIs account for over sixty percent of all financial business assets, while shadow banks account for about twenty percent of the assets (with the exception of the U. K. with a fraction of around thirty percent). The remainder of the assets, a fraction usually smaller than twenty percent, is held by insurance and pensions funds. In the U. S., MFIs together with insurance and pension funds accounted for about 90 percent of financial business assets in the late sixties, roughly equally split. By 2018, all three subsectors account for a roughly equal share of assets. Canada has by far the highest fraction of assets accounted for by insurance and pension funds with just under 50 percent, while MFIs account for a third of assets and insurance and pension funds for around twenty percent. Finally, Australia has about the same fraction of assets accounted for by insurance and pensions funds as the U. S. (around a third) but shadow banks are less important compared to MFIs (roughly 20 percent versus just under 50 percent).

The time series trends in Figure 3 mask the business cycle variation in the relative prominence of different financial business subsectors. In Table 4, we report the estimated coefficients

from the regression

$$\text{Sector share}_{s,c,t} = \alpha_c + \alpha_s + \alpha_{c,s} + \sum_{i=1}^4 \beta_i \text{Asset growth}_{c,t} \times \mathbb{1}_{s=i} + \epsilon_{s,c,t},$$

where $\text{Sector share}_{sct}$ is the year-over-year change in total assets of sector s as a fraction of the total assets of the aggregate financial sector in country c and quarter t and Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$, and $\mathbb{1}_{s=i}$ is an indicator equal to one when sector s is the i^{th} sector. The table shows that, on average, increases in the size of the aggregate financial sector correspond to decreases in the share of the financial sector represented by MFIs and insurance companies and pension funds, an increase in the share of the financial sector represented by the shadow banks, and a decline in the size of the household sector relative to the size of the financial business sector. A one GDP multiple increase in the size of the financial sector corresponds to a 11 basis point (bps) decrease in the relative size of the MFI sector, a 9 bps decrease in the relative size of the insurance and pension fund sector, a 7 bps increase in the relative size of the shadow banking sector (although the coefficient is not statistically significant), and a 30 bps decrease in the relative size of the household sector.

Table 4 also shows that there is cross-country heterogeneity in the cyclicity of the share of financial business represented by MFIs, with the relative size of the MFI sectors in the U. K. and Germany co-varying positively with the overall size of the financial sector. This makes the average estimate for the G-7 economies and Spain positive, with a one GDP multiple increase in the size of the financial sector corresponding to a 15 bps increase in the relative size of the MFI sector for those countries. More generally, comparing the full sample results to the results for the G-7 economies and Spain, we see that the largest economies tend to have larger variation in the shares of the different subsectors at business cycle frequency than on average. In other words, the composition of the financial business sector in the

largest economies tends to be more dynamic at the business cycle frequency than that of the smaller economies in our sample. For all the countries in the sample, the relative size of the insurance and pension fund sector has either a negative or an insignificant covariation with the size of the financial sector, and the size of the shadow banking sector has either a positive or an insignificant covariation with the size of the financial sector.

Overall, Figure 3 and Table 4 show that, while there are some commonalities in the aggregate trends of financial sector growth across countries, there is also substantial heterogeneity in both the average composition of the financial sector and in how the composition of the financial sector varies over time. Table A.2 in the Appendix shows that these results are not driven by the inclusion of the central bank balance sheets in the definition of the MFI sector. For the four countries (U. S., Canada, Australia and Japan) for which we can separate the assets of the respective central banks from the total MFI assets and include them in the shadow banking sector instead, the share of MFIs in the overall financial sector is strongly countercyclical and the share of shadow banks is strongly procyclical. Thus, even though central banks expand their balance sheets during recessions, they do so at a pace that is commensurate with the growth of the relative prominence of the MFI sector during recessions and at a much slower pace than the contraction of the share of the shadow banking sector.

4.2 Balance sheet cyclicity at the subsector level

In Table 5, we study how the absolute sizes of the different financial business subsectors fluctuate with the business cycle, and whether each subsector finances asset growth through debt or equity issuances.¹¹ More specifically, Table 5a reports the estimates from the panel

¹¹ Table A.3 in the Appendix shows that these results hold if we separate the monetary authority from the balance sheets of the MFI sector.

regression

$$\text{Asset Growth}_{sct} = \alpha_c + \alpha_s + \alpha_{cs} + \sum_{i=1}^N \beta_i \frac{\Delta \text{GDP}_{ct}}{\text{GDP}_{c,t-4}} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where $\text{Asset Growth}_{sct}$ is the year-over-year change in total assets as a fraction of nominal GDP of sector s in country c and quarter t , and $\mathbb{1}_{s=i}$ is an indicator equal to one when sector s is the i^{th} sector. The table shows that, on average, MFIs, shadow banks, and households grow with the economy but at different rates. In general, the shadow banking subsector is the fastest growing, with a one percent increase in real GDP corresponding, on average, to a 60 bps increase in the size of the shadow banking sector relative to nominal GDP. The MFI subsector is the next most sensitive to growth in real activity, with a one percent increase in real GDP corresponding, on average, to a 23 bps increase in the size of the MFI sector relative to nominal GDP, although the average coefficient is not statistically significant, while the size of the insurance and pension fund sector is on average uncorrelated with real activity growth. The size of the household sector overwhelmingly is positively correlated with real GDP growth, with a one percent increase in real GDP corresponding, on average, to a 41 bps increase in the size of the household sector relative to nominal GDP. Looking at the individual country results, we see that, for all subsectors, the statistically significant coefficients are positive, suggesting that, overall, no subsector shrinks relative to the rest of the economy as the economy expands during a normal business cycle.

The other two panels in Table 5 document that the all-country patterns for how MFIs, insurance companies and pensions funds, shadow banks, and households finance asset growth presented in Figure 1 hold at the country level. We estimate the following regression:

$$\text{Growth}_{sct} = \alpha_c + \alpha_s + \alpha_{cs} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where Growth_{sct} is the year-over-year change in total liabilities (5b), and financial equity (5c)

of sector s in country c and quarter t , respectively. All changes measured in multiples of GDP terms. Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$. On average, the three financial business subsectors finance asset growth through liabilities while households finance asset growth through equity. Examining the cross-country patterns for the insurance and pension fund sector, however, reveals important heterogeneity in the magnitude of the estimated coefficients, with insurance companies in the G-7 economies and Spain relying on a mix of liabilities and equity issuance to expand the size of their balance sheets. For these countries, one dollar of insurance and pension fund asset growth is financed 80 percent through debt issuance and 20 percent through equity.

4.3 Cyclicalities of credit provision at the subsector level

The subsector-level results so far suggest that, while there are cross-country differences in the composition of the aggregate financial sector – both in trend terms and in terms of changes at the business cycle frequency – the balance sheet management practices of each subsector are remarkably similar across the countries in our sample. We now study whether the cross-country differences in the cyclicalities of credit provision we documented in Table 3 can be explained by the cross-country differences in the composition of the aggregate financial sector. Figure 4 provides the first indication that that may be the case: the share of intermediated credit in the economy is larger when the MFI sector is a bigger share of the aggregate financial sector, and smaller when either the insurance and pension fund or the shadow banking sector is a bigger share of the aggregate financial sector. These relationships hold both cross-country – countries for which MFIs represent a bigger portion of the financial system tend to have a greater share of credit intermediated – and within country – as the MFI sector shrinks within a country, the share of intermediated credit declines.

We study these relationships more formally in Table 6, which reports the estimates from the

panel regression

$$\text{Credit growth}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where $\text{Credit Growth}_{sct}$ is the year-over-year change in loans (6a), debt instruments (6b), and total credit (6c) provided by the sector s to the non-financial corporate sector in country c in quarter t as a fraction of nominal GDP in quarter $t - 4$, Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets of sector s in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$, and $\mathbb{1}_{s=i}$ is an indicator equal to one when sector s is the i^{th} sector. As suggested by Figure 4, as the MFI sector grows, the total amount of credit provided by MFIs through loans increases. Similarly, as the insurance and pension fund and shadow banking sectors grow, the total amount of credit provided by these subsectors through debt instruments increases. Household provision of credit is largely acyclical, through either loans or debt instruments.

Table 7 then shows that, although the different parts of the financial sector expand credit provision to the non-financial corporate sector as their balance sheets grow, they do so at a pace that is slower than the rate of expansion of their balance sheet size. More specifically, Table 7 reports the coefficients estimated from the regression

$$\text{Credit share}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where $\text{Credit share}_{sct}$ is the year-over-year change in loans (7a), debt instruments (7b), and total credit (7c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total assets of sector s , Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$, and $\mathbb{1}_{s=i}$ is an indicator equal to one when sector s is the i^{th} sector. Overall, as total assets grow, MFIs allocate a smaller fraction of their balance sheet to

loans to the non-financial corporate sector. The effect seems strongest in European countries such as Germany, France, Italy and the U.K. The coefficient is also negative for Japan and the U. S. but only marginally significant for the former and not significant for the latter. The only country where the effect goes in the opposite direction is Australia. Similarly, on average, as the insurance and pension fund and shadow banking sectors grow, they allocate a smaller fraction of their balance sheet to debt securities. That is, as a financial subsector grows, it allocates a smaller fraction of its balance sheet to corporate credit provision, as documented in Table 7c. For the traditional banking sector, that translates into banks allocating a smaller share of their assets to loans. For the alternative providers of credit in the economy, that translates into a smaller share of assets allocated to the debt instruments of the non-financial corporate credit sector.

Finally, in Table 8 we study whether the sources of credit to the non-financial corporate sector change with the business cycle. More specifically, we consider whether the share of credit provided by different types of financial institutions changes as the institution grows:

$$\text{Share in total}_{sct} = \alpha_c + \alpha_s + \alpha_{s,c} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{s,c,t},$$

where $\text{Share in total}_{sct}$ is the year-over-year change in loans (8a), debt instruments (8b), and total credit (8c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total loans, total debt instruments and total credit used by the non-financial corporate sector, respectively, Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$, and $\mathbb{1}_{s=i}$ is an indicator equal to one when sector s is the i^{th} sector.

While Table 7 provides some information on how financial institutions supply credit over the business cycle, Table 8 provides information on how the non-financial corporate sector obtains credit. Overall, credit provision by MFIs is procyclical at least for some countries: As total assets grow, a higher fraction of total credit is provided through MFIs in the total

sample as well as the U.S., Canada, the U.K., Spain and “Other Europe”. With the exception of the U.S., this is driven by loans whereas in the U.S. the credit provision through debt instruments is the driver behind the overall result. Total credit provided through insurance and pension funds is largely acyclical meaning that the fraction of credit coming from the insurance and pension funds sector does not change as total assets fluctuate over the business cycle. Thus, except for select countries, different parts of the financial sector expand their credit provision as their assets expand in line with the growth of total credit provision to the non-financial corporate sector.

Taken together, the results of this section suggest that the cross-country differences in the business cycle dynamics of provision of credit to the non-financial corporate sector is driven by differences in the composition of the aggregate financial sector. Countries that are more reliant on the traditional banking sector for corporate credit provision have lower procyclicality of the share of intermediated credit but greater procyclicality of total corporate credit provision. Indeed, Figure 6 shows that the cyclicity of intermediated credit is lower for countries with larger average prominence of the traditional banking sector and lower for countries with larger average prominence of the insurance and pension fund sector. At the same time, the cyclicity of total credit provision is higher for countries with larger average prominence of the traditional banking sector and lower for countries with larger average prominence of alternative providers of credit (insurance and pension funds, and shadow banks).

5 Conclusion

This paper studies aggregate cyclicity of credit provision to the non-financial corporate sector in an international context. We argue that the cross-country differences in the procyclicality of intermediated credit – that is, credit provided through loans – arise due to

differences in the composition of the aggregate financial sector. Across the countries in our sample, the banking and shadow banking sectors manage their liabilities in a procyclical manner, increasing their balance sheet size one-for-one with increases in liabilities. Insurance companies, pension funds and households, instead, finance asset growth with equity, leading to acyclical or countercyclical leverage dynamics. Since banks and shadow banks primarily provide credit through loans and the other subsectors primarily provide credit through corporate bonds, loans extended to productive firms are supported primarily by bank debt while corporate bond issuance is supported primarily by insurance company and pension fund equity. Thus, at the instrument level, the cyclicalities of bank leverage determines the cyclicalities of bank loan issuance, while the cyclicalities of insurance company leverage determines the cyclicalities of corporate bond issuance. At the country level, the cyclicalities of total credit and the cyclicalities of loans as a fraction of total credit is then determined by the relative prominence of the bank and the insurance company and pension fund sectors and by how that prominence changes over the business cycle. Our results suggest that the inherent cross-country differences in public institutions, regulatory environment and historical experiences translate into a differential composition of the aggregate financial sector rather than differential balance sheet management practices of the subsectors of the aggregate financial sector.

A recent BIS study (Aldasoro and Ehlers, 2018) documents that the post-financial-crisis expansion of corporate credit globally has been driven by international debt securities issuance, while the role of banks has diminished – both as lenders and as investors in debt securities. Through the lens of our paper, this is a natural consequence of the rise of non-bank financial intermediaries across the world.

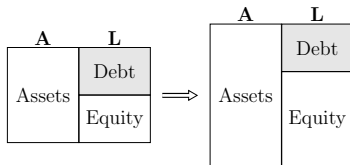
References

- Adrian, Tobias, Nina Boyarchenko, and Hyun-Song Shin, 2015, On the scale of financial intermediaries, Staff Report No. 743 Federal Reserve Bank of New York.
- Adrian, Tobias, and Hyun Song Shin, 2010, Liquidity and leverage, *Journal of Financial Intermediation* 19, 418–437.
- , 2014, Procyclical leverage and Value-at-Risk, *Review of Financial Studies* 27, 373–403.
- Albertazzi, Ugo, and Leonardo Gambacorta, 2009, Bank profitability and the business cycle, *Journal of Financial Stability* 5, 393–409.
- Aldasoro, Iñaki, and Torsten Ehlers, 2018, Global liquidity: changing instrument and currency patterns, *BIS Quarterly Review* September.
- Avdjiev, Stefan, Bat-el Berger, and Hyun Song Shin, 2018, Gauging procyclicality and financial vulnerability in asia through the bis banking and financial statistics, Discussion paper, Bank for International Settlements Working Paper N. 735.
- Avdjiev, Stefan, Leonardo Gambacorta, Linda S Goldberg, and Stefano Schiaffi, 2017, The shifting drivers of global liquidity, Discussion paper, National Bureau of Economic Research Working Paper, N. 23565.
- Baglioni, Angelo, Elena Beccalli, Andrea Boitani, and Andrea Monticini, 2013, Is the leverage of European banks procyclical?, *Empirical Economics* 45, 1251–1266.
- Beccalli, Elena, Andrea Boitani, and Sonia Di Giuliantonio, 2015, Leverage pro-cyclicality and securitization in US banking, *Journal of Financial Intermediation* 24, 200–230.
- Blanchard, Olivier, Jonathan D Ostry, Atish R Ghosh, and Marcos Chamon, 2017, Are capital inflows expansionary or contractionary? Theory, policy implications, and some evidence, *IMF Economic Review* 65, 563–585.
- Boyarchenko, Nina, Ralph Koijen, and Or Shachar, 2019, Institutional ownership and issuance fragmentation, Discussion paper, Federal Reserve Bank of New York Staff Report.
- Cetorelli, Nicola, and Linda Goldberg, 2012a, Liquidity management of US global banks: Internal capital markets in the great recession, *Journal of International Economics* 88, 299–311.
- Cetorelli, Nicola, and Linda S Goldberg, 2011, Global banks and international shock transmission: Evidence from the crisis, *IMF Economic Review* 59, 41–76.
- , 2012b, Banking globalization and monetary transmission, *The Journal of Finance* 67, 1811–1843.
- Chodorow-Reich, Gabriel, Andra Ghent, and Valentin Haddad, 2018, Asset insulators, Discussion paper, National Bureau of Economic Research Working Paper N. 24973.

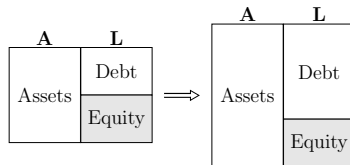
- Damar, H Evren, Césaire A Meh, and Yaz Terajima, 2013, Leverage, balance-sheet size and wholesale funding, *Journal of Financial Intermediation* 22, 639–662.
- Duc, Louis Bê, and Gwenäel Le Breton, 2009, Flow-of-funds analysis at the ECB: Framework and applications, Occasional Paper Series No. 105, August 2009.
- Eurostat, 1996, European system of accounts: ESA 1995, Discussion paper, European Union.
- , 2013, European system of accounts: ESA 2010, Discussion paper, European Union.
- Gambacorta, Leonardo, and Hyun Song Shin, 2018, Why bank capital matters for monetary policy, *Journal of Financial Intermediation* 35, 17–29.
- Herman, Alexander, Deniz Igan, and Juan Solé, 2017, The macroeconomic relevance of bank and nonbank credit: An exploration of us data, *Journal of Financial Stability* 32, 124–141.
- Koijen, Ralph, and Motohiro Yogo, 2015, The cost of financial frictions for life insurers, *American Economic Review* 105, 445–75.
- , 2018, The fragility of market risk insurance, Discussion paper, National Bureau of Economic Research Working Paper N. 24182.
- Modigliani, Franco, and Merton Miller, 1958, The cost of capital, corporation finance, and the theory of investment, *American Economic Review* 48, 261–297.
- Myers, Stewart C, 1984, The capital structure puzzle, *The Journal of Finance* 39, 574–592.
- Naceur, S Ben, Katherin Marton, and Caroline Roulet, 2018, Basel III and bank-lending: Evidence from the United States and Europe, *Journal of Financial Stability* 39, 1–27.
- Shin, Hyun Song, and Kwanho Shin, 2011, Procyclicality and monetary aggregates, Discussion paper, National Bureau of Economic Research Working Paper, N. 16836.
- United Nations, 2009, System of national accounts 2008, Discussion paper, European Communities, IMF, OECD, UN and World Bank.

Figure 2. Modes of asset growth. Mode 1 is through equity issuance, decreasing leverage. Mode 2 is through debt issuance, increasing leverage. Mode 3 is through a combination of debt and equity issuance, keeping leverage fixed. In Modes 1 and 2, the shaded area indicates the balance sheet component that is held fixed.

(a) Through equity growth



(b) Through debt growth



(c) Through both

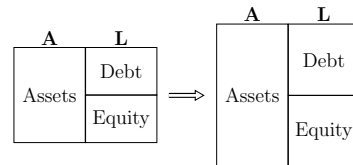


Figure 3. Composition of financial business sector. This figure plots the time series of the fraction of total financial business assets represented by monetary financial institutions (MFIs), insurance and pension funds (Insurance/PF) and shadow banks (left-hand scale), together with the time series of total financial business assets as a multiple of nominal GDP (right-hand scale). MFIs include the monetary authority and central banks; “Shadow banks” refers to all financial institutions that are not MFIs, insurance companies or pension funds

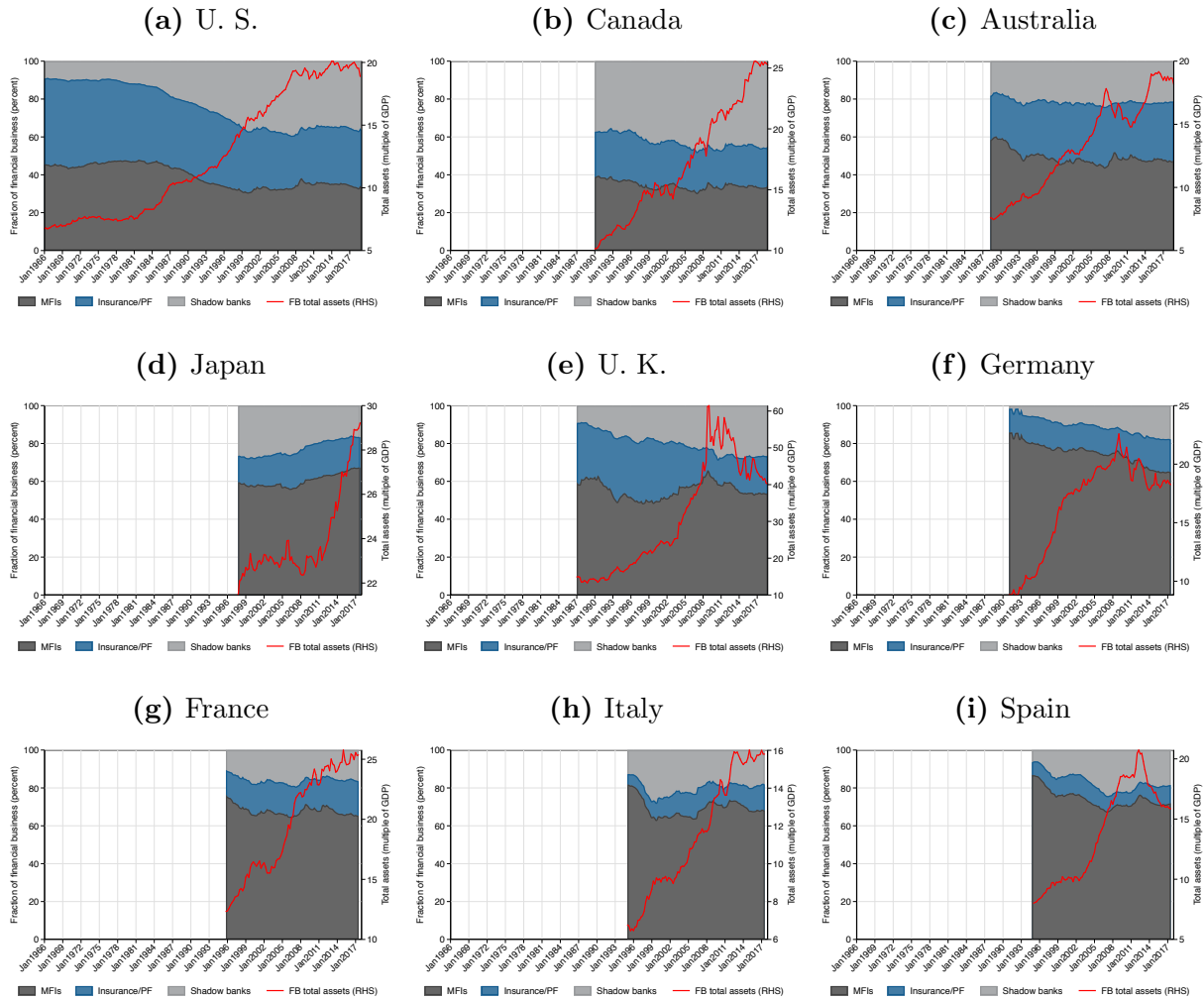


Figure 4. Composition of credit to non-financial corporate business. This figure plots the time series of the fraction of credit to non-financial corporate business extended through loans and debt instruments (left-hand scale), together with the time series of total credit to non-financial corporate business as a multiple of nominal GDP (right-hand scale).

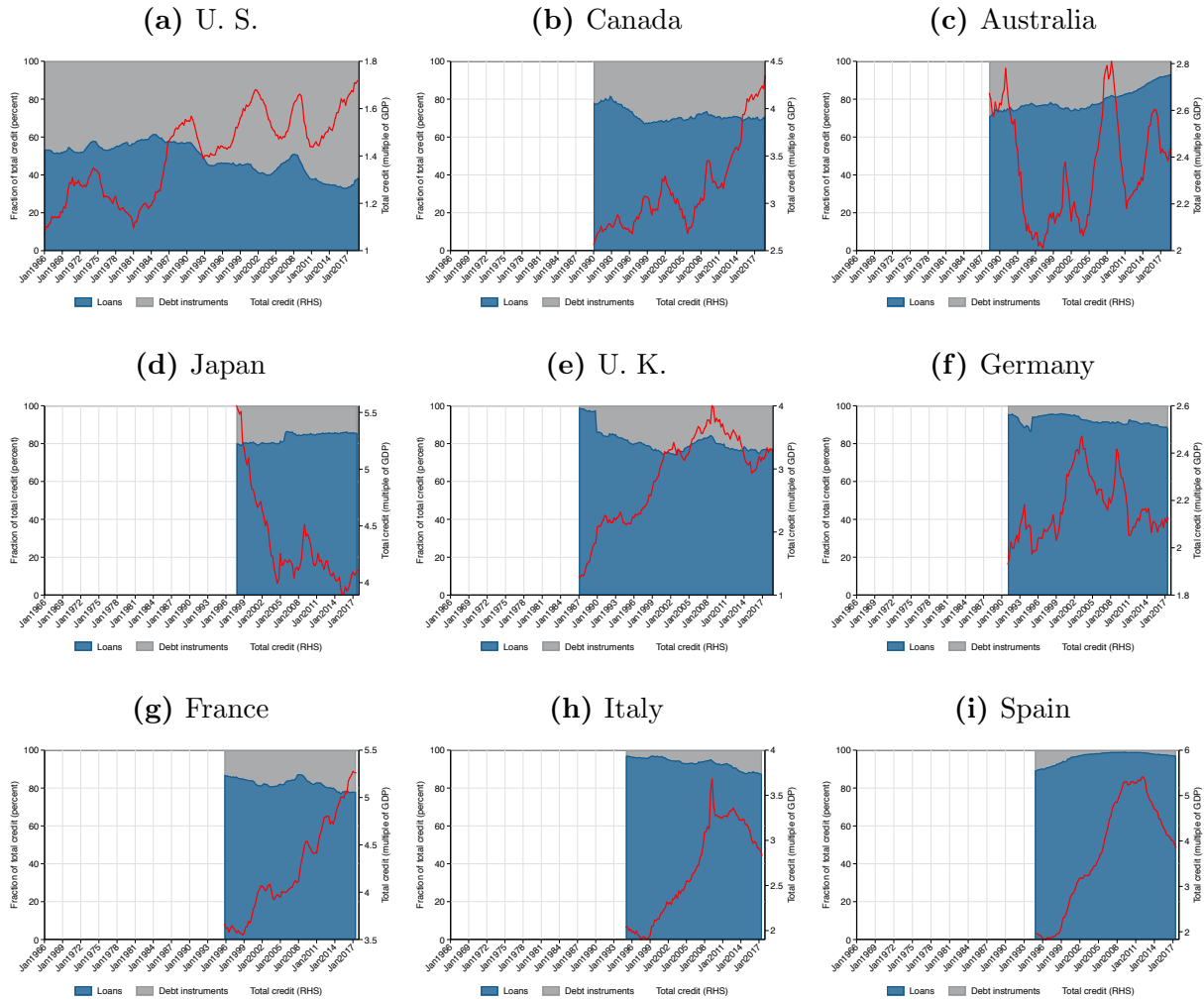


Figure 5. Intermediated credit and sector prominence. This figure plots the relationship between the share of intermediated credit to the non-financial corporate sector and the relative size of financial business subsectors. Intermediated credit defined as the ratio between loans and the sum of loans and debt instruments. “MFIs” are monetary financial institutions including the monetary authority and central banks; “Shadow banks” refers to all financial institutions that are not MFIs, insurance companies or pension funds.

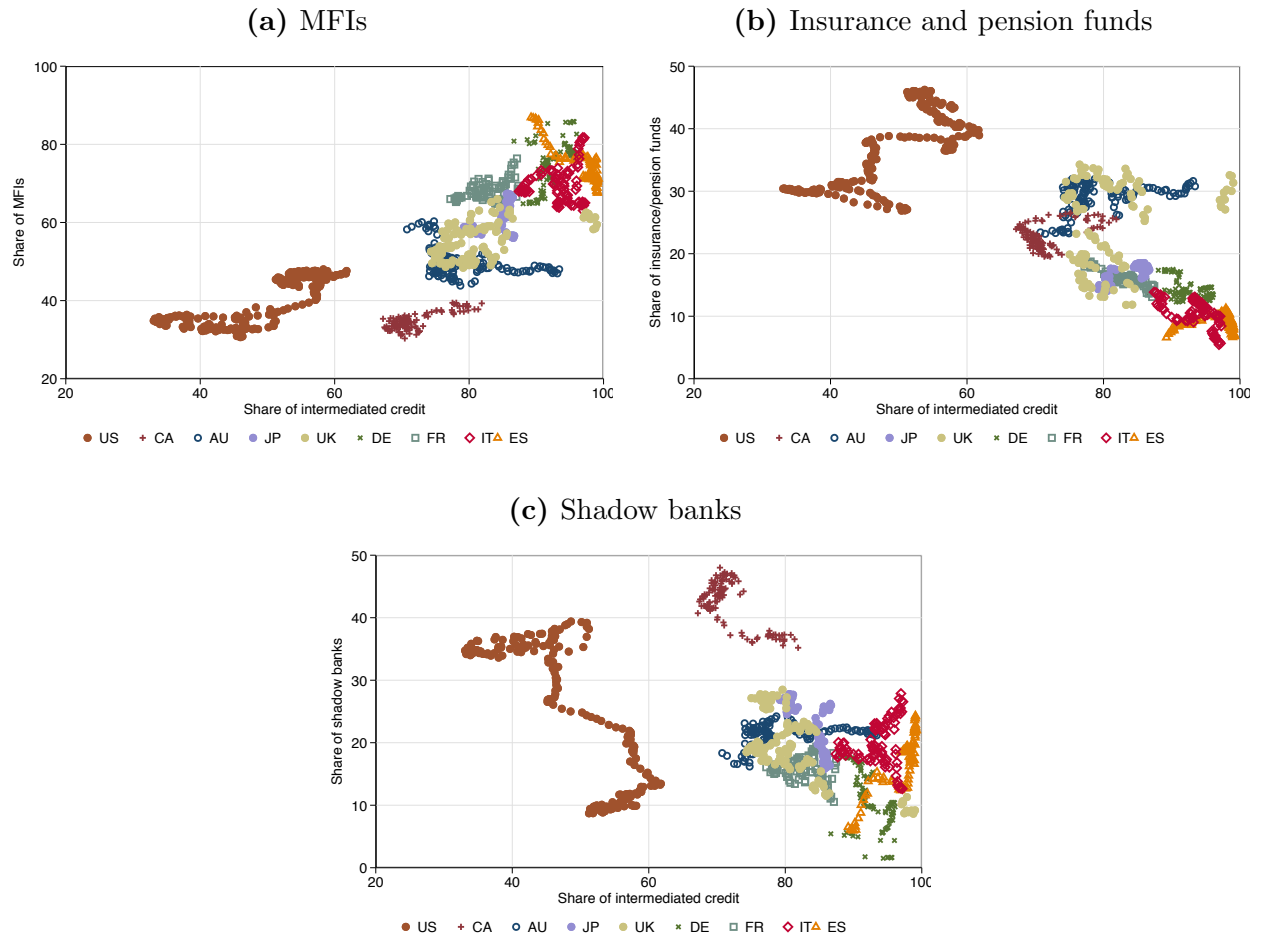


Table 1: Summary statistics. This table reports the median sizes of different sectors relative to the size of the economy (in nominal GDP terms). The financial business sector is composed of monetary financial institutions (“MFI”, including the monetary authority and central banks), insurance and pension funds, and shadow banks. “US”, “CA”, “AU”, “JP”, “UK”, “DE”, “FR”, “IT”, and “ES” refers to the U. S., Canada, Australia, Japan, the U. K., Germany, France, Italy and Spain, respectively. “Other Europe” refers to observations for European countries except the countries listed in the table. Maximum values are reported in parentheses below the median.

(a) Non-financial corporate business

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	2.39 (4.27)	3.09 (3.99)	-0.48 (0.37)	1.44 (1.72)	0.67 (0.90)	0.69 (1.10)
CA	4.73 (6.61)	9.48 (13.0)	-4.69 (-3.41)	3.04 (4.35)	2.19 (3.07)	0.92 (1.30)
AU	2.41 (2.95)	7.93 (9.75)	-5.46 (-4.90)	2.34 (2.81)	1.88 (2.37)	0.50 (0.78)
JP	6.36 (9.63)	10.5 (14.5)	-4.23 (-3.36)	4.19 (5.56)	3.57 (4.46)	0.63 (1.14)
UK	3.88 (4.80)	9.82 (11.6)	-5.77 (-3.37)	3.12 (4.00)	2.39 (3.37)	0.67 (0.86)
DE	4.53 (5.32)	6.86 (7.70)	-2.20 (-1.59)	2.14 (2.47)	1.97 (2.30)	0.18 (0.28)
FR	9.84 (13.8)	13.5 (17.8)	-3.75 (-2.22)	4.07 (5.28)	3.40 (4.12)	0.72 (1.16)
IT	3.87 (4.28)	8.49 (9.63)	-4.57 (-2.74)	2.66 (3.68)	2.47 (3.49)	0.17 (0.39)
ES	7.13 (8.52)	12.3 (14.3)	-4.68 (-2.43)	3.92 (5.41)	3.82 (5.35)	0.079 (0.21)
Other Europe	6.65 (94.3)	11.1 (130.6)	-4.45 (-1.66)	4.35 (36.1)	3.87 (33.1)	0.29 (6.81)
All countries	5.02 (94.3)	9.78 (130.6)	-4.23 (0.37)	3.43 (36.1)	3.05 (33.1)	0.40 (6.81)

(b) MFIs

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	4.28 (7.26)	4.12 (6.77)	0.19 (0.55)	0.39 (0.55)	0.33 (0.47)	0.073 (0.15)
CA	5.35 (8.76)	5.57 (9.29)	-0.16 (0.054)	1.08 (1.57)	0.98 (1.46)	0.11 (0.19)
AU	6.32 (9.32)	6.81 (9.61)	-0.41 (0.11)	1.45 (1.91)	1.12 (1.52)	0.36 (0.55)
JP	13.5 (19.7)	13.6 (19.0)	0.079 (0.69)	2.16 (2.41)	1.93 (2.22)	0.23 (0.28)
UK	13.0 (40.4)	12.9 (40.2)	0.16 (0.79)	2.05 (2.90)	1.75 (2.68)	0.24 (0.40)
DE	12.9 (17.2)	12.3 (16.5)	0.34 (0.91)	1.37 (1.88)	1.37 (1.84)	0.040 (0.12)
FR	13.1 (17.4)	13.5 (17.0)	0.11 (0.40)	1.57 (2.09)	1.54 (1.94)	0.088 (0.16)
IT	7.45 (11.7)	8.13 (10.9)	0.28 (0.92)	1.78 (2.28)	1.71 (2.18)	0.051 (0.11)
ES	9.80 (15.8)	9.84 (15.5)	0.068 (0.54)	1.90 (3.45)	1.89 (3.44)	0.026 (0.045)
Other Europe	11.1 (143.3)	11.1 (140.9)	0.15 (3.78)	1.45 (18.4)	1.86 (18.1)	0.023 (0.53)
All countries	9.99 (143.3)	9.84 (140.9)	0.15 (3.78)	1.44 (18.4)	1.52 (18.1)	0.065 (0.55)

(c) Households

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	11.3 (17.2)	2.47 (3.99)	9.25 (14.1)	0.10 (0.20)	0.010 (0.037)	0.091 (0.18)
CA	9.22 (12.8)	2.67 (4.12)	6.44 (8.79)	0.054 (0.11)	0.0040 (0.026)	0.044 (0.091)
AU	7.64 (11.1)	3.66 (5.13)	4.15 (6.06)	0.0024 (0.017)	0 (0.00020)	0.0023 (0.017)
JP	12.5 (14.1)	2.62 (3.39)	9.94 (11.4)	0.030 (0.055)	0.0055 (0.021)	0.026 (0.043)
UK	11.2 (13.6)	3.20 (4.24)	7.49 (9.84)	0.015 (0.018)	0.0095 (0.014)	0.0052 (0.0099)
DE	6.70 (7.24)	2.42 (2.86)	4.07 (5.14)	0 (0.036)	0 (0)	0.020 (0.036)
FR	7.46 (9.24)	2.25 (2.75)	5.34 (6.50)	0.018 (0.086)	0.017 (0.053)	0.0084 (0.040)
IT	9.43 (10.7)	1.87 (2.32)	7.59 (8.72)	0.041 (0.081)	0.033 (0.038)	0.013 (0.049)
ES	6.44 (7.92)	2.76 (3.55)	3.73 (4.92)	0.0032 (0.046)	0 (0)	0.016 (0.046)
Other Europe	6.59 (98.4)	2.44 (45.6)	3.91 (55.3)	0.0011 (0.66)	0 (0.66)	0.0046 (0.14)
All countries	8.18 (98.4)	2.53 (45.6)	4.98 (55.3)	0.015 (0.66)	0.0021 (0.66)	0.012 (0.18)

(d) Insurance and pension funds

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	4.24 (6.07)	4.12 (5.82)	0.13 (0.28)	0.34 (0.44)	0 (0)	0.34 (0.44)
CA	3.73 (5.53)	3.76 (5.58)	-0.052 (-0.012)	0.24 (0.31)	0.071 (0.10)	0.19 (0.22)
AU	4.01 (5.90)	4.28 (6.27)	-0.32 (-0.15)	0.088 (0.19)	0.023 (0.091)	0.049 (0.10)
JP	4.13 (4.83)	3.91 (4.34)	0.16 (0.60)	0.30 (0.46)	0.16 (0.28)	0.14 (0.19)
UK	7.11 (9.29)	6.97 (9.01)	0.099 (0.74)	0.28 (0.42)	0.057 (0.12)	0.20 (0.36)
DE	2.57 (3.28)	2.76 (3.16)	-0.14 (0.17)	0.043 (0.13)	0.033 (0.12)	0.013 (0.021)
FR	3.23 (4.70)	3.19 (4.41)	0.12 (0.54)	0.017 (0.30)	0.016 (0.042)	0.24 (0.29)
IT	1.35 (2.19)	1.49 (2.26)	-0.17 (-0.0044)	0.024 (0.049)	0 (0.0023)	0.024 (0.049)
ES	1.23 (1.60)	1.18 (1.68)	0.0062 (0.069)	0.010 (0.064)	0.0059 (0.013)	0.0080 (0.057)
Other Europe	1.41 (60.9)	1.45 (60.8)	-0.019 (1.03)	0.0059 (0.71)	0.0040 (0.67)	0.015 (0.21)
All countries	2.29 (60.9)	2.42 (60.8)	-0.012 (1.03)	0.024 (0.71)	0.010 (0.67)	0.043 (0.44)

(e) Financial business

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	11.0 (20.1)	10.7 (19.0)	0.36 (1.36)	0.86 (1.05)	0.37 (0.53)	0.49 (0.64)
CA	16.0 (25.6)	15.5 (25.7)	0.57 (1.12)	2.23 (3.14)	1.80 (2.58)	0.47 (0.63)
AU	13.0 (19.2)	13.7 (20.0)	-0.61 (-0.0075)	1.58 (1.96)	1.43 (1.86)	0.12 (0.23)
JP	23.1 (29.2)	23.1 (28.1)	0.18 (1.24)	3.53 (4.37)	3.13 (3.98)	0.40 (0.45)
UK	24.6 (61.5)	25.3 (61.4)	-0.0073 (0.54)	2.94 (4.01)	2.29 (3.51)	0.56 (0.85)
DE	18.2 (22.6)	17.9 (22.3)	-0.029 (0.77)	1.47 (2.04)	1.47 (1.98)	0.061 (0.17)
FR	20.2 (25.8)	20.4 (25.5)	0.19 (0.80)	1.62 (2.43)	1.58 (2.11)	0.38 (0.49)
IT	11.3 (16.0)	11.6 (14.6)	0.12 (1.84)	2.14 (2.69)	2.00 (2.57)	0.11 (0.17)
ES	14.2 (20.7)	14.2 (20.2)	0.062 (0.62)	2.13 (3.61)	2.13 (3.58)	0.041 (0.15)
Other Europe	15.0 (285.0)	14.8 (284.9)	0.084 (8.06)	1.92 (19.6)	2.15 (19.2)	0.051 (0.78)
All countries	15.8 (285.0)	15.6 (284.9)	0.12 (8.06)	1.86 (19.6)	1.86 (19.2)	0.15 (0.85)

(f) Shadow banks

	Assets	Liabilities	Equity	Credit instr.	Loans	Debt instr.
US	2.60 (7.59)	2.57 (7.43)	0.046 (0.72)	0.13 (0.26)	0.050 (0.12)	0.074 (0.22)
CA	7.02 (11.7)	6.35 (11.2)	0.77 (1.29)	1.07 (1.35)	0.93 (1.13)	0.17 (0.29)
AU	2.94 (4.30)	2.79 (4.40)	0.13 (0.42)	0.35 (0.40)	0.29 (0.35)	0.044 (0.091)
JP	5.44 (6.37)	5.57 (6.49)	-0.031 (0.062)	1.17 (1.56)	1.14 (1.53)	0.026 (0.045)
UK	4.79 (16.7)	5.55 (17.6)	-0.48 (0.48)	0.55 (0.87)	0.43 (0.77)	0.086 (0.14)
DE	1.84 (3.32)	2.16 (3.63)	-0.26 (-0.013)	0.047 (0.12)	0.043 (0.097)	0.016 (0.029)
FR	3.28 (4.22)	3.27 (4.23)	0.025 (0.23)	0.029 (0.21)	0.027 (0.15)	0.070 (0.086)
IT	2.31 (3.21)	1.97 (2.32)	0.42 (1.04)	0.29 (0.42)	0.27 (0.40)	0.018 (0.036)
ES	2.94 (4.14)	3.02 (4.05)	0.00065 (0.24)	0.097 (0.42)	0.097 (0.41)	0.0100 (0.047)
Other Europe	2.32 (88.8)	2.32 (90.8)	-0.040 (2.16)	0.17 (2.16)	0.27 (2.16)	0.0100 (0.48)
All countries	2.86 (88.8)	2.86 (90.8)	-0.0034 (4.40)	0.20 (2.16)	0.25 (2.16)	0.021 (0.48)

Table 2: Cyclicalities of financial business balance sheet. Panel (2a) in this table reports the estimated coefficients β from the regression

$$\text{Asset growth}_{c,t} = \alpha_c + \beta \frac{\Delta \text{GDP}_{c,t}}{\text{GDP}_{c,t-4}} + \epsilon_{ct}$$

where Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t-4$. $C_{c,t}$ and $\text{GDP}_{c,t}$ are nominal and real GDP in country c and quarter t , respectively. Panels (2b) and (2c) report the estimated coefficients β from the regressions

$$\frac{\Delta D_{c,t}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{c,t} + \epsilon_{ct}, \text{ and } \frac{\Delta E_{c,t}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{c,t} + \epsilon_{c,t}, \text{ respectively.}$$

where $\Delta D_{c,t}$ and $\Delta E_{c,t}$ are the year-over-year changes in total liabilities and financial equity of the aggregate financial system in country c and quarter t , respectively. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Total assets

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Real GDP growth	0.078 (0.029)***	0.037 (0.065)	0.109 (0.039)***	0.074 (0.028)***	0.111 (0.040)***	0.121 (0.060)**	0.123 (0.045)***	-0.423 (0.359)	0.041 (0.062)	0.302 (0.058)***	0.000 (0.035)	0.170 (0.086)*	0.084 (0.032)***
Adj. R^2	0.001	-0.008	0.056	0.119	0.079	0.042	0.084	0.033	-0.010	0.233	-0.024	0.125	0.001
N. obs	2113	882	357	212	112	119	77	124	101	84	85	87	1231

(b) Total liabilities

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.997 (0.012)***	0.976 (0.007)***	0.964 (0.021)***	0.966 (0.014)***	1.075 (0.047)***	1.033 (0.029)***	0.908 (0.029)***	0.977 (0.008)***	0.967 (0.018)***	0.934 (0.043)***	1.131 (0.084)***	0.955 (0.039)***	1.002 (0.014)***
Adj. R^2	0.963	0.981	0.936	0.986	0.867	0.963	0.968	0.994	0.962	0.936	0.761	0.973	0.959
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

(c) Financial equity

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.003 (0.012)	0.024 (0.007)***	0.036 (0.021)*	0.034 (0.014)**	-0.075 (0.047)	-0.033 (0.029)	0.092 (0.029)***	0.023 (0.008)***	0.033 (0.018)*	0.066 (0.043)	-0.131 (0.084)	0.045 (0.039)	-0.002 (0.014)
Adj. R^2	-0.014	0.022	0.006	0.069	0.014	0.009	0.219	0.077	0.009	0.048	0.019	0.055	-0.018
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

Table 3: Cyclicalities of aggregate credit provision. This table reports the estimated coefficients β from the regression

$$\frac{\Delta \text{Credit}_{c,t}}{C_{c,t-4}} = \alpha_c + \beta \text{Asset growth}_{c,t} + \epsilon_{c,t},$$

where $\Delta \text{Credit}_{c,t}$ is the year-over-year change in loans (3a), debt instruments (3b), total credit (3c), and share in intermediated credit (3d) provided by the aggregate financial sector to the non-financial corporate sector in country c and quarter t . Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$. The share in intermediated credit is measured as the ratio between total loans taken out by the non-financial corporate sector and the total credit used by the non-financial corporate sector. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Loans

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.038 (0.015)**	0.031 (0.009)***	0.126 (0.028)***	0.033 (0.015)**	-0.015 (0.021)	0.116 (0.021)***	0.065 (0.025)***	0.016 (0.005)***	0.013 (0.012)	0.043 (0.014)***	0.066 (0.054)	0.265 (0.024)***	0.040 (0.018)**
Adj. R^2	0.040	0.085	0.278	0.061	-0.005	0.365	0.110	0.117	0.005	0.097	0.018	0.658	0.034
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

(b) Debt instruments

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.004 (0.003)	-0.000 (0.002)	-0.005 (0.004)	-0.003 (0.009)	0.012 (0.011)	0.022 (0.007)***	0.009 (0.011)	-0.000 (0.003)	0.005 (0.006)	-0.014 (0.010)	-0.010 (0.010)	-0.004 (0.001)***	0.005 (0.004)
Adj. R^2	-0.013	-0.010	-0.003	-0.007	0.006	0.122	-0.011	-0.016	-0.008	0.019	0.017	0.171	-0.017
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

(c) Total credit

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.043 (0.016)***	0.031 (0.009)***	0.122 (0.028)***	0.030 (0.018)	-0.003 (0.027)	0.138 (0.024)***	0.074 (0.032)**	0.016 (0.007)**	0.018 (0.016)	0.029 (0.012)**	0.056 (0.049)	0.261 (0.025)***	0.045 (0.019)**
Adj. R^2	0.017	0.078	0.266	0.046	-0.018	0.378	0.126	0.085	0.018	0.036	0.009	0.657	0.012
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

(d) Intermediated credit

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
Asset growth	0.035 (0.019)*	0.128 (0.062)**	0.178 (0.105)*	1.188 (0.531)**	-0.348 (0.263)	0.330 (0.179)*	0.101 (0.182)	0.108 (0.072)	-0.184 (0.209)	0.429 (0.233)*	0.518 (0.341)	0.199 (0.072)***	0.014 (0.017)
Adj. R^2	-0.013	0.003	0.002	0.056	0.011	0.022	-0.023	0.011	-0.011	0.060	0.052	0.102	-0.018
N. obs	2114	883	357	213	112	119	77	124	101	84	85	87	1231

Table 4: Cyclicity of sectoral prominence. This table reports the estimated coefficients β_s from the regression

$$\Delta \text{Sector share}_{s,c,t} = \alpha_c + \alpha_s + \alpha_{c,s} + \sum_{i=1}^4 \beta_i \text{Asset growth}_{c,t} \times \mathbb{1}_{s=i} + \epsilon_{s,c,t},$$

where $\Delta \text{Sector share}_{s,c,t}$ is the year-over-year change in total assets of sector s as a fraction of the total assets of the aggregate financial sector in country c and quarter t , Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets of the aggregate financial sector in country c to quarter t and nominal GDP measured for country c in quarter $t-4$, and $\mathbb{1}_{s=i}$ is an indicator equal to 1 if sector s is the i^{th} subsector. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	-0.106 (0.064)*	0.151 (0.077)*	0.096 (0.172)	-0.771 (0.335)**	-1.228 (0.206)***	-0.835 (0.442)*	-0.097 (0.277)	0.268 (0.065)***	0.784 (0.193)***	-0.210 (0.355)	-0.153 (1.103)	-0.045 (0.231)	-0.129 (0.066)*
Insurance and Pens. Fund \times Asset growth	-0.095 (0.022)***	-0.330 (0.036)***	-0.476 (0.056)***	-0.824 (0.153)***	0.076 (0.153)	0.407 (0.311)	-0.294 (0.093)***	-0.288 (0.037)***	-0.616 (0.073)***	-0.275 (0.121)**	-0.637 (0.197)***	-0.431 (0.045)***	-0.059 (0.018)***
Shadow Banks \times Asset growth	0.073 (0.059)	0.127 (0.065)*	0.275 (0.148)*	1.595 (0.250)***	1.152 (0.183)***	0.428 (0.169)**	0.391 (0.206)*	0.019 (0.042)	-0.168 (0.156)	0.486 (0.244)**	0.789 (0.975)	0.476 (0.244)*	0.074 (0.069)
Households \times Asset growth	-0.301 (0.051)***	-0.623 (0.082)***	-1.731 (0.229)***	1.358 (0.777)*	0.099 (0.390)	-0.677 (0.285)**	-0.931 (0.304)***	-0.559 (0.057)***	-1.885 (0.102)***	-0.844 (0.185)***	-3.963 (1.221)***	-2.105 (0.335)***	-0.259 (0.051)***
Adj. R^2	0.030	0.090	0.151	0.065	0.186	0.064	0.168	0.327	0.476	0.087	0.082	0.331	0.026
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

Table 5: Cyclicalities of balance sheets across sectors. This table reports the estimated coefficients β_s from the regression

$$\text{Growth}_{sct} = \alpha_c + \alpha_s + \alpha_{cs} + \beta_s \text{Asset growth}_{sct} + \epsilon_{sct},$$

where Growth_{sct} is the year-over-year change in total assets (5a), total liabilities (5b), and financial equity (5c) of sector s in country c and quarter t , respectively. All changes measured in multiples of GDP terms. Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Total assets

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Real GDP growth	0.023 (0.017)	-0.026 (0.046)	0.042 (0.030)	0.014 (0.008)*	-0.005 (0.015)	0.049 (0.029)*	0.045 (0.023)*	-0.321 (0.300)	0.011 (0.061)	0.109 (0.054)**	-0.028 (0.035)	0.074 (0.073)	0.031 (0.019)*
Insurance and Pens. Fund \times Real GDP growth	-0.000 (0.005)	0.016 (0.006)***	0.017 (0.004)***	0.018 (0.008)**	0.032 (0.016)**	0.040 (0.028)	0.020 (0.008)***	0.004 (0.032)	0.011 (0.005)**	0.043 (0.011)***	0.016 (0.005)***	0.013 (0.002)***	-0.001 (0.006)
Shadow Banks \times Real GDP growth	0.060 (0.029)**	0.038 (0.017)**	0.056 (0.015)***	0.042 (0.023)*	0.084 (0.026)***	0.031 (0.021)	0.058 (0.020)***	-0.105 (0.079)	0.018 (0.007)**	0.150 (0.026)***	0.012 (0.015)	0.083 (0.029)***	0.058 (0.032)*
Households \times Real GDP growth	0.041 (0.009)***	0.092 (0.012)***	0.082 (0.013)***	0.110 (0.041)***	0.080 (0.031)***	0.060 (0.031)*	0.067 (0.021)***	0.021 (0.032)	0.021 (0.015)**	0.030 (0.027)***	0.121 (0.029)***	0.133 (0.023)***	0.086 (0.010)***
Adj. R^2	0.009	0.022	0.059	0.132	0.080	0.024	0.062	0.030	-0.011	0.135	0.131	0.096	0.008
N. obs	8452	3528	1428	848	448	476	308	496	404	336	340	348	4924

(b) Total liabilities

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.997 (0.012)***	0.991 (0.012)***	0.939 (0.018)***	0.904 (0.017)***	0.795 (0.093)***	0.938 (0.057)***	0.941 (0.026)***	1.008 (0.009)***	0.952 (0.021)***	0.890 (0.038)***	0.940 (0.078)***	0.952 (0.035)***	1.000 (0.016)***
Insurance and Pens. Fund \times Asset growth	0.931 (0.050)***	0.792 (0.036)***	0.767 (0.076)***	0.889 (0.025)***	1.013 (0.017)***	1.051 (0.016)***	0.591 (0.073)***	0.736 (0.056)***	1.041 (0.169)***	0.564 (0.089)***	1.047 (0.126)***	0.791 (0.058)***	0.946 (0.055)***
Shadow Banks \times Asset growth	0.994 (0.009)***	0.945 (0.023)***	0.928 (0.021)***	0.966 (0.014)***	1.065 (0.077)***	0.766 (0.042)***	1.077 (0.045)***	0.929 (0.036)***	0.835 (0.096)***	0.944 (0.029)***	0.819 (0.058)***	0.973 (0.030)***	0.996 (0.009)***
Households \times Asset growth	0.036 (0.030)	0.068 (0.014)***	0.115 (0.033)***	0.049 (0.024)**	0.004 (0.020)	0.145 (0.066)**	-0.063 (0.093)	-0.011 (0.032)	0.198 (0.037)***	0.081 (0.031)***	0.032 (0.018)*	0.241 (0.088)***	0.028 (0.037)
Adj. R^2	0.955	0.960	0.908	0.905	0.746	0.855	0.921	0.984	0.954	0.924	0.715	0.931	0.954
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

(c) Financial equity

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.003 (0.012)	0.009 (0.012)	0.061 (0.018)***	0.096 (0.017)***	0.205 (0.093)**	0.062 (0.057)	0.059 (0.026)**	-0.008 (0.009)	0.048 (0.021)**	0.110 (0.038)***	0.060 (0.078)	0.048 (0.035)	0.000 (0.016)
Insurance and Pens. Fund \times Asset growth	0.069 (0.050)	0.208 (0.036)***	0.233 (0.076)***	0.111 (0.025)***	-0.013 (0.017)	-0.051 (0.016)***	0.409 (0.073)***	0.264 (0.056)***	-0.041 (0.169)	0.436 (0.089)***	-0.047 (0.126)	0.209 (0.058)***	0.054 (0.055)
Shadow Banks \times Asset growth	0.006 (0.009)	0.055 (0.023)**	0.072 (0.021)***	0.034 (0.014)**	-0.065 (0.077)	0.234 (0.042)***	-0.077 (0.045)*	0.071 (0.036)*	0.165 (0.096)*	0.056 (0.029)*	0.181 (0.058)***	0.027 (0.030)	0.004 (0.009)
Households \times Asset growth	0.964 (0.030)***	0.932 (0.014)***	0.885 (0.033)***	0.951 (0.024)***	0.996 (0.020)***	0.855 (0.066)***	1.063 (0.093)***	1.011 (0.032)***	0.802 (0.037)***	0.919 (0.031)***	0.968 (0.018)***	0.759 (0.088)***	0.972 (0.037)***
Adj. R^2	0.631	0.766	0.690	0.958	0.655	0.733	0.818	0.642	0.454	0.724	0.773	0.627	0.606
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

Table 6: Cyclicity of credit provision at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Credit growth}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where Credit Growth $_{sct}$ is the year-over-year change in loans (6a), debt instruments (6b), and total credit (6c) provided by the sector s to the non-financial corporate sector in country c in quarter t . All changes measured in multiple of GDP terms. Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Loans

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.065 (0.009)***	0.043 (0.009)***	0.106 (0.030)***	0.056 (0.020)***	0.144 (0.040)***	0.245 (0.031)***	0.046 (0.027)*	0.027 (0.005)***	0.005 (0.025)	0.040 (0.016)**	0.075 (0.047)	0.256 (0.046)***	0.072 (0.011)***
Insurance and Pens. Fund \times Asset growth	0.011 (0.011)	-0.002 (0.006)	0.043 (0.021)**	0.000 (0.000)	-0.005 (0.005)	0.003 (0.002)	0.006 (0.011)	0.001 (0.002)	0.026 (0.021)	0.001 (0.002)	-0.001 (0.001)	-0.009 (0.008)	0.012 (0.012)
Shadow Banks \times Asset growth	0.006 (0.003)**	0.014 (0.010)	-0.009 (0.010)	-0.000 (0.004)	-0.003 (0.020)	0.007 (0.018)	0.096 (0.036)***	0.010 (0.014)	0.009 (0.005)*	-0.005 (0.007)	-0.002 (0.012)	-0.019 (0.023)	0.006 (0.003)**
Households \times Asset growth	0.006 (0.004)	-0.002 (0.002)	-0.002 (0.003)	0.002 (0.001)**	0.000 (0.000)	0.000 (0.000)	0.003 (0.002)	-0.000 (0.000)	0.000 (0.000)	-0.002 (0.003)	0.001 (0.000)	0.000 (0.000)	0.009 (0.006)
Adj. R^2	0.189	0.140	0.193	0.085	0.105	0.633	0.113	0.253	-0.017	0.030	0.100	0.546	0.204
N. obs	8446	3522	1428	842	448	476	308	496	404	336	340	348	4924

(b) Debt instruments

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.001 (0.001)	-0.001 (0.001)	0.001 (0.002)	0.022 (0.006)***	0.002 (0.017)	0.056 (0.013)***	-0.001 (0.003)	-0.002 (0.002)	0.001 (0.005)	-0.003 (0.006)	0.001 (0.003)	0.001 (0.001)	0.003 (0.002)
Insurance and Pens. Fund \times Asset growth	0.009 (0.002)***	0.023 (0.005)***	0.047 (0.009)***	0.027 (0.015)*	0.040 (0.019)**	0.002 (0.003)	-0.002 (0.007)	0.016 (0.006)**	0.005 (0.010)	0.087 (0.017)***	0.039 (0.012)***	-0.046 (0.026)*	0.008 (0.002)***
Shadow Banks \times Asset growth	0.001 (0.001)	0.006 (0.002)***	0.005 (0.002)**	0.009 (0.004)**	0.016 (0.006)**	0.012 (0.008)	0.004 (0.002)	0.003 (0.001)**	0.009 (0.008)	0.013 (0.003)***	0.005 (0.003)	0.004 (0.003)	0.001 (0.001)
Households \times Asset growth	-0.001 (0.002)	-0.006 (0.002)***	0.002 (0.002)	-0.015 (0.003)***	0.001 (0.002)	-0.000 (0.000)	-0.004 (0.003)	0.001 (0.000)***	0.001 (0.006)	-0.002 (0.003)	0.003 (0.002)	0.001 (0.004)	0.000 (0.002)
Adj. R^2	0.020	0.054	0.049	0.127	0.098	0.228	-0.012	0.037	-0.047	0.166	0.032	0.013	0.024
N. obs	5965	2888	784	852	448	476	308	496	168	108	340	168	3077

(c) Total credit

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.065 (0.009)***	0.042 (0.010)***	0.104 (0.031)***	0.078 (0.022)***	0.147 (0.032)***	0.301 (0.039)***	0.045 (0.028)	0.025 (0.006)***	0.001 (0.028)	0.034 (0.019)*	0.077 (0.049)	0.257 (0.046)***	0.072 (0.011)***
Insurance and Pens. Fund \times Asset growth	0.018 (0.011)	0.020 (0.008)**	0.070 (0.029)**	0.027 (0.015)*	0.035 (0.017)**	0.004 (0.004)	0.004 (0.011)	0.017 (0.007)**	0.031 (0.022)	0.023 (0.027)	0.038 (0.012)***	-0.046 (0.023)**	0.018 (0.013)
Shadow Banks \times Asset growth	0.006 (0.003)**	0.019 (0.010)*	-0.011 (0.010)	0.009 (0.006)	0.013 (0.019)	0.019 (0.020)	0.100 (0.035)***	0.013 (0.014)	0.010 (0.007)	-0.015 (0.013)	0.003 (0.013)	-0.018 (0.023)	0.006 (0.003)**
Households \times Asset growth	0.005 (0.005)	-0.007 (0.003)***	-0.001 (0.003)	-0.013 (0.003)***	0.001 (0.002)	-0.000 (0.000)	-0.001 (0.004)	0.000 (0.000)	-0.001 (0.002)	-0.001 (0.004)	0.004 (0.002)	-0.002 (0.002)	0.008 (0.006)
Adj. R^2	0.181	0.119	0.164	0.139	0.116	0.629	0.114	0.191	-0.019	-0.002	0.101	0.551	0.201
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

Table 7: Cyclicity of portfolio allocation at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Credit share}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where $\text{Credit share}_{sct}$ is the year-over-year change in loans (7a), debt instruments (7b), and total credit (7c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total assets of sector s . Asset growth is $\frac{\Delta A_{ct}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t-4$. Column “G7” refers to observations for G-7 economies and Spain; column “EU4” refers to observations for Germany, France, Italy and Spain; column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and U. K. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Loans

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	-0.171 (0.038)***	-0.222 (0.045)***	-0.347 (0.192)*	-0.097 (0.320)	0.667 (0.761)	1.187 (0.391)***	-0.398 (0.209)*	-0.206 (0.037)***	-0.794 (0.261)***	-0.419 (0.156)***	-1.504 (0.394)***	0.374 (0.317)	-0.155 (0.049)***
Insurance and Pens. Fund \times Asset growth	-0.057 (0.034)	-0.171 (0.068)**	-0.113 (0.323)	-0.000 (0.000)	-0.497 (0.141)***	0.006 (0.097)	-0.841 (0.331)**	-0.117 (0.029)***	-0.851 (1.327)	-0.207 (0.102)**	-0.132 (0.113)	-1.361 (0.817)*	-0.037 (0.035)
Shadow Banks \times Asset growth	-0.019 (0.019)	-0.723 (0.111)***	-2.083 (0.515)***	-0.189 (0.112)*	-1.503 (0.300)***	-2.346 (0.795)***	-2.364 (0.749)***	-0.383 (0.109)***	-2.093 (1.067)*	-0.740 (0.416)*	-5.073 (0.707)***	-2.008 (0.859)**	0.020 (0.021)
Households \times Asset growth	-0.032 (0.028)	-0.077 (0.023)***	-0.042 (0.034)	0.003 (0.006)	-0.004 (0.003)	-0.000 (0.000)	0.020 (0.017)	-0.012 (0.004)***	0.000 (0.000)	-0.066 (0.038)*	-0.023 (0.004)***	0.000 (0.000)	-0.018 (0.034)
Adj. R^2	0.004	0.086	0.109	-0.001	0.253	0.166	0.291	0.220	0.188	0.025	0.471	0.113	0.000
N. obs	8446	3522	1428	842	448	476	308	496	404	336	340	348	4924

(b) Debt instruments

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	-0.032 (0.008)***	-0.056 (0.014)***	-0.063 (0.036)*	0.046 (0.120)	-0.220 (0.250)	0.238 (0.154)	-0.089 (0.023)***	-0.051 (0.014)***	-0.014 (0.054)	-0.063 (0.034)*	-0.070 (0.040)*	-0.015 (0.010)	-0.012 (0.007)
Insurance and Pens. Fund \times Asset growth	-0.036 (0.023)	-0.198 (0.100)**	0.095 (0.407)	-0.944 (0.316)***	-0.219 (0.531)	-0.148 (0.097)	-0.935 (0.243)***	-0.192 (0.119)	-0.261 (0.633)	0.189 (0.584)	1.238 (0.777)	-14.547 (4.524)***	-0.008 (0.015)
Shadow Banks \times Asset growth	-0.024 (0.010)**	-0.121 (0.030)***	-0.976 (0.409)**	-0.200 (0.059)***	-0.023 (0.095)	-0.045 (0.246)	-0.016 (0.044)	-0.094 (0.032)***	-5.387 (4.019)	-0.524 (0.251)**	-0.022 (0.133)	-1.858 (0.508)***	-0.011 (0.006)*
Households \times Asset growth	-0.033 (0.010)***	-0.093 (0.021)***	-0.013 (0.057)	-0.169 (0.022)***	-0.050 (0.018)***	-0.007 (0.006)	-0.044 (0.019)**	0.001 (0.001)	-0.092 (0.094)	-0.110 (0.065)*	0.011 (0.025)	-0.028 (0.049)	-0.011 (0.007)
Adj. R^2	-0.001	0.017	0.030	0.106	-0.008	-0.003	0.238	0.050	0.134	0.015	0.008	0.407	-0.008
N. obs	5965	2888	784	852	448	476	308	496	168	108	340	168	3077

(c) Total credit

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	-0.188 (0.039)***	-0.272 (0.053)***	-0.376 (0.199)*	-0.051 (0.328)	0.447 (0.670)	1.425 (0.444)***	-0.487 (0.217)**	-0.257 (0.049)***	-0.835 (0.283)***	-0.464 (0.192)**	-1.575 (0.412)***	0.373 (0.319)	-0.161 (0.049)***
Insurance and Pens. Fund \times Asset growth	-0.098 (0.046)**	-0.372 (0.121)***	-0.138 (0.641)	-0.944 (0.316)***	-0.716 (0.448)	-0.142 (0.158)	-1.776 (0.425)***	-0.310 (0.125)**	-0.916 (1.397)	-0.151 (0.767)	1.106 (0.825)	-7.999 (3.187)**	-0.057 (0.041)
Shadow Banks \times Asset growth	-0.027 (0.020)	-0.847 (0.121)***	-2.527 (0.632)***	-0.388 (0.110)***	-1.526 (0.284)***	-2.391 (0.795)***	-2.379 (0.745)***	-0.477 (0.111)***	-4.067 (2.587)	-1.262 (0.680)*	-5.095 (0.729)***	-2.271 (1.022)**	0.014 (0.021)
Households \times Asset growth	-0.055 (0.030)*	-0.163 (0.028)***	-0.049 (0.029)*	-0.165 (0.019)***	-0.054 (0.018)***	-0.007 (0.006)	-0.024 (0.031)	-0.012 (0.004)***	-0.060 (0.029)**	-0.061 (0.055)	-0.013 (0.026)	-0.051 (0.030)*	-0.024 (0.035)
Adj. R^2	0.005	0.074	0.080	0.051	0.243	0.157	0.311	0.236	0.132	0.004	0.427	0.125	0.000
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

Table 8: Cyclicity of share of credit provided at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Share in total}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \sum_{i=1}^N \beta_i \text{Asset growth}_{ict} \times \mathbb{1}_{s=i} + \epsilon_{sct},$$

where $\text{Share in total}_{sct}$ is the year-over-year change in loans (8a), debt instruments (8b), and total credit (8c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total loans, total debt instruments and total credit used by the non-financial corporate sector, respectively. Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$. The column “G7” refers to observations for the G-7 economies plus Spain; the column “EU4” refers to observations for Germany, France, Italy and Spain; the column “Other Europe” refers to observations for European countries except Germany, France, Italy, Spain and the U. K. Newey-West standard errors with 4 lags are reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, and * significant at 10% level, respectively.

(a) Loans

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.411 (0.077)***	0.328 (0.106)***	0.334 (0.448)	-0.227 (1.351)	4.952 (1.832)***	0.560 (0.870)	0.061 (0.247)	0.337 (0.100)***	-0.546 (0.998)	0.062 (0.448)	-0.738 (0.504)	1.674 (0.434)***	0.437 (0.097)***
Insurance and Pens. Fund \times Asset growth	-0.016 (0.077)	0.042 (0.109)	0.469 (0.380)	-0.000 (0.000)	-0.100 (0.190)	0.129 (0.130)	-0.205 (0.063)***	0.068 (0.072)	1.104 (1.029)	0.055 (0.061)	-0.044 (0.037)	-0.432 (0.398)	-0.024 (0.085)
Shadow Banks \times Asset growth	0.069 (0.053)	0.197 (0.257)	-0.210 (0.286)	-0.332 (0.531)	0.408 (0.677)	-1.209 (0.560)**	1.473 (0.689)**	0.133 (0.376)	0.601 (0.221)***	-0.177 (0.234)	0.720 (0.414)*	-0.783 (0.541)	0.073 (0.055)
Households \times Asset growth	-0.054 (0.047)	0.031 (0.054)	-0.016 (0.058)	0.192 (0.090)**	0.012 (0.011)	0.064 (0.001)	-0.024 (0.048)	-0.000 (0.018)	-0.054 (0.000)	0.021 (0.090)	0.000 (0.032)	-0.075 (0.000)	-0.075 (0.056)
Adj. R^2	0.029	0.015	-0.000	-0.006	0.116	0.003	0.071	0.066	0.002	-0.024	0.009	0.209	0.033
N. obs	8446	3522	1428	842	448	476	308	496	404	336	340	348	4924

(b) Debt instruments

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	-0.022 (0.163)	-0.105 (0.182)	2.800 (1.412)**	2.527 (0.702)***	0.001 (1.941)	3.029 (1.976)	-1.649 (0.424)***	-0.278 (0.084)***	0.422 (0.413)	-0.965 (0.517)*	2.109 (2.058)	3.748 (1.819)**	0.056 (0.267)
Insurance and Pens. Fund \times Asset growth	0.067 (0.275)	1.792 (0.599)***	8.156 (2.900)***	-0.188 (2.119)	3.961 (2.133)*	-0.064 (0.733)	3.056 (1.414)**	1.698 (0.656)***	3.655 (1.990)*	2.102 (3.788)	12.667 (4.556)***	-2.827 (17.625)	-0.129 (0.300)
Shadow Banks \times Asset growth	-0.079 (0.215)	0.835 (0.232)***	3.634 (1.912)*	0.587 (0.337)*	1.583 (0.582)***	1.207 (1.628)	0.842 (0.241)***	0.495 (0.184)***	0.343 (1.478)	0.536 (0.243)**	2.578 (1.501)*	6.100 (4.523)	-0.210 (0.260)
Households \times Asset growth	-0.116 (0.174)	-0.487 (0.396)	0.549 (1.817)	-1.750 (0.354)***	-0.019 (0.245)	-0.083 (0.069)	-0.538 (0.359)	0.008 (0.015)	0.403 (3.117)	-1.145 (0.700)	0.699 (1.984)	0.850 (3.453)	-0.023 (0.183)
Adj. R^2	-0.006	0.010	0.032	0.102	0.079	0.029	0.095	0.100	-0.034	-0.004	0.000	0.042	-0.008
N. obs	5957	2888	784	852	448	476	308	496	168	108	340	168	3069

(c) Total credit

	All	G7	EU4	US	Canada	Australia	Japan	UK	Germany	France	Italy	Spain	Other Europe
MFI \times Asset growth	0.395 (0.074)***	0.266 (0.096)***	0.360 (0.477)	2.042 (0.689)***	3.638 (0.802)***	0.856 (0.863)	-0.315 (0.225)	0.283 (0.080)***	-0.850 (1.041)	0.244 (0.547)	-0.188 (0.513)	1.788 (0.405)***	0.437 (0.095)***
Insurance and Pens. Fund \times Asset growth	0.039 (0.074)	0.434 (0.202)**	1.007 (0.568)*	1.391 (1.070)	1.233 (0.528)**	0.031 (0.196)	-0.203 (0.235)	0.418 (0.219)*	1.268 (1.043)	0.457 (0.572)	1.450 (0.408)***	-2.452 (1.188)**	0.001 (0.073)
Shadow Banks \times Asset growth	0.060 (0.050)	0.284 (0.225)	-0.266 (0.295)	0.018 (0.292)	0.651 (0.427)	-0.664 (0.584)	1.904 (0.687)***	0.198 (0.327)	0.567 (0.299)*	-0.399 (0.349)	0.839 (0.432)*	-0.769 (0.549)	0.062 (0.052)
Households \times Asset growth	-0.120 (0.049)**	-0.277 (0.112)**	-0.006 (0.092)	-0.851 (0.183)***	0.071 (0.063)	-0.021 (0.017)	-0.054 (0.083)	-0.010 (0.016)	-0.088 (0.077)	-0.013 (0.106)	0.107 (0.112)	-0.104 (0.080)	-0.076 (0.050)
Adj. R^2	0.026	0.015	0.000	0.067	0.151	0.004	0.141	0.063	0.024	-0.021	-0.007	0.249	0.031
N. obs	8456	3532	1428	852	448	476	308	496	404	336	340	348	4924

A Data Appendix

A.1 Sectoral definitions

We follow the sectoral definitions from the ECB and the Bank of England, who split the financial business sector into monetary financial institutions (MFIs), insurance companies and pension funds (I&P), and other financial institutions (which we label shadow banks or SB).¹² The ECB defines the MFI sector as institutions that are central banks, credit institutions, other deposit taking corporations (including those issuing electronic money), and money market funds. As described below, for United States, Canada and Japan, we identify institution types that fall under this definition. The SB sector is then defined as the difference between financial business totals and the sum of the MFI and the I&P sectors.

United States For United States, we define the MFI sector as being composed of the monetary authority (L.109), private depository institutions (L.110), security brokers and dealers (L.130), bank holding companies (L.131), and money market mutual funds (L.121).

Canada We define the MFI sector in Canada as the sum of the Bank of Canada, the banking sector, and the money market mutual funds sector.

Japan For Japan, we define the MFI sector as being composed of the Bank of Japan, the banking sector, the broker-dealer sector, and the money-market mutual funds sector.

Australia For Australia, we define the MFI sector as being composed of the Central Bank, the banking sector, other depository institutions, and the money market mutual funds sector.

A.2 Share imputations

As discussed in Section 2, we only have the who-to-whom version of Flow of Funds for members of the European Union, excluding the United Kingdom. For the other countries in our sample (i.e., the United States, Canada, Japan and United Kingdom), we observe only the overall holdings by different institutions of particular types of instruments, without disaggregation into the different types of issuers of those instruments. For these countries, we have to then impute the holdings of credit instruments issued by non-financial corporate business as follows.

¹² In addition, the ECB reports finer gradations of the I&P as well as the SB sector for some countries in some quarters. We use the coarser gradation to maintain compatibility with the Bank of England data.

United States The Flow of Funds of the United States reports asset-side positions in corporate and foreign bonds and in loans.

Canada The Canada Statistics Office reports holdings of short-term paper, “other” bonds, non-mortgage loans, mortgage loans and corporate loans. For each sector s , we impute the sector’s holdings of loans to non-financial corporate business as

$$\begin{aligned}\text{Imputed loans}_{cst} = & \frac{\text{Non-mortg. corp. loans}_{ct}}{\text{Non-mortg. loans}_{ct}} \text{Non-mortg. loans}_{sct} \\ & + \frac{\text{Mortg. corp. loans}_{ct}}{\text{Mortg. loans}_{ct}} \text{Mortg. loans}_{sct} \\ & + \frac{\text{Corp. loans}_{ct}}{\text{Total corp. loans}_{ct}} \text{Corp. loans}_{sct},\end{aligned}$$

where $\text{Non-mortg. corp. loans}_{ct}$, $\text{Mortg. corp. loans}_{ct}$, and Corp. loans_{ct} is the total non-mortgage loans, mortgage loans and corporate loans on the liabilities side of the balance sheet for non-financial corporate business in quarter t , respectively; $\text{Non-mortg. loans}_{ct}$, Mortg. loans_{ct} , and $\text{Total corp. loans}_{ct}$ are the total non-mortgage loans, mortgage loans and corporate loans on the liabilities side of the balance sheet for the aggregate economy in quarter t , respectively. Similarly, we impute the sector’s holdings of debt instruments issued by non-financial corporate business as

$$\text{Imputed debt}_{cst} = \frac{\text{Corp ST paper}_{ct}}{\text{ST paper}_{ct}} \text{ST paper}_{sct} + \frac{\text{Corp Bonds}_{ct}}{\text{Bonds}_{ct}} \text{Bonds}_{sct},$$

where $\text{Corp ST paper}_{ct}$ and Corp Bonds_{ct} are the total short-term paper and “other” bonds, respectively, on the liabilities side of the balance sheet for non-financial corporate business in quarter t ; ST paper_{ct} and Bonds_{ct} are the total short-term paper and “other” bonds, respectively, on the liabilities-side of the balance sheet for the aggregate economy in quarter t .

Japan The Flow of Funds data maintained by Bank of Japan reports asset-side positions in loans, commercial paper, external bonds, and industrial bonds. For each sector s , we impute the sector’s holdings of loans to non-financial corporate business as

$$\text{Imputed loans}_{cst} = \frac{\text{Corp Loans}_{ct}}{\text{Loans}_{ct}} \text{Loans}_{sct},$$

where Corp Loans_{ct} is the total loans on the liabilities side of the balance sheet for non-financial corporate business in quarter t and Loans_{ct} is the total loans on the liabilities-side of the balance sheet for the aggregate economy in quarter t . Similarly, we impute the sector’s

holdings of debt instruments issued by non-financial corporate business as

$$\begin{aligned} \text{Imputed debt}_{cst} = & \frac{\text{Corp CP}_{ct}}{\text{CP}_{ct}} \text{CP}_{sct} + \frac{\text{Corp Ext. Bonds}_{ct}}{\text{Ext. Bonds}_{ct}} \text{Ext. Bonds}_{sct} \\ & + \frac{\text{Corp Ind. Bonds}_{ct}}{\text{Ind. Bonds}_{ct}} \text{Ind. Bonds}_{sct}, \end{aligned}$$

where Corp CP_{ct} , $\text{Corp Ext. Bonds}_{ct}$, and $\text{Corp Ind. Bonds}_{ct}$ are the total commercial paper, external bonds and industrial bonds, respectively, on the liabilities side of the balance sheet for non-financial corporate business in quarter t ; CP_{ct} , Ext. Bonds_{ct} , and Ind. Bonds_{ct} are the total commercial paper, external bonds and industrial bonds, respectively, on the liabilities-side of the balance sheet for the aggregate economy in quarter t .

A.3 Robustness of share imputation

The tables in the main body of the paper demonstrate that the cyclicalities of credit provision to the non-financial corporate sector by subsectors of the financial business sector for members of the European Union are similar to the cyclicalities of credit provision by financial business subsectors to the non-financial corporate sector in other countries. Since the European Union flow of funds reports directly the components of credit provision to the non-financial corporate sector, so that we do not have to impute the provision of credit by sub-sectors, this suggests that the share imputation described above provides a reasonable approximation of the subsector-level credit provision. We now test this more formally by evaluating the performance of the imputation procedure for the European Union countries. More specifically, for each (sub)sector s in country c quarter t , we compute the imputed value of the sector's holdings of non-financial corporate business loans and debt instruments as

$$\begin{aligned} \text{Imputed loans}_{cst} = & \frac{\text{Corp Loans}_{ST,ct}}{\text{Loans}_{ST,ct}} \text{Loans}_{ST,sct} + \frac{\text{Corp Loans}_{LT,ct}}{\text{Loans}_{LT,ct}} \text{Loans}_{LT,sct} \\ \text{Imputed debt}_{cst} = & \frac{\text{Corp Debt}_{ST,ct}}{\text{Debt}_{ST,ct}} \text{Debt}_{ST,sct} + \frac{\text{Corp Debt}_{LT,ct}}{\text{Debt}_{LT,ct}} \text{Debt}_{LT,sct}, \end{aligned}$$

where the subscript ST (LT) denotes securities with maturity less than (greater than) one year, $\text{Corp Loans}_{.,ct}$ ($\text{Corp Debt}_{.,ct}$) are the total loans made to (total debt instruments sold by) the non-financial corporate business of the given maturity, $\text{Loans}_{.,ct}$ ($\text{Debt}_{.,ct}$) are the total loans made to (total debt instruments sold by) all borrowers of the given maturity, and $\text{Loans}_{.,sct}$ ($\text{Debt}_{.,sct}$) are the holdings by sector s of the loans made to (debt instruments sold by) all borrowers of the given maturity in country c , quarter t .

Figure A.1 plots the imputed versus actual¹³ loans to the non-financial corporate sector and debt instruments of the non-financial corporate sector held by MFIs, insurance companies and pension funds, and shadow banks. Overall, the imputation procedure performs well in

¹³ As reported in the Flow of Funds

recovering the level of non-financial corporate loans held by the subsectors of the financial business sector. For debt instruments, although there is still a positive relationship between the imputed and the actual amounts, the imputation procedure over-estimates the amount held by MFIs and underestimates the amount held by insurance companies and pension funds, perhaps reflecting the reluctance by insurance companies and pension funds to hold debt instruments issued by financial institutions.

More importantly, Table A.1 shows that the year-over-year change in imputed quantities is positively and statistically significantly correlated to the year-over-year change in the reported quantities. For loans to non-financial corporate business, the correlation is 84%; for debt instruments, the correlation is 42%. Thus, overall, the imputed holdings of non-financial corporate business credit instruments are a good proxy for the actual holdings.

Figure A.1. Relationship between imputed and actual credit provision. This figure plots imputed versus actual loans to the non-financial corporate sector (left column) and debt instruments of the non-financial corporate sector (right column) for European Union countries excluding the United Kingdom for subsectors of the financial business sector. “MFIs” are monetary financial institutions including the monetary authority and central banks; “Shadow banks” refers to all financial institutions that are not MFIs, insurance companies or pension funds.

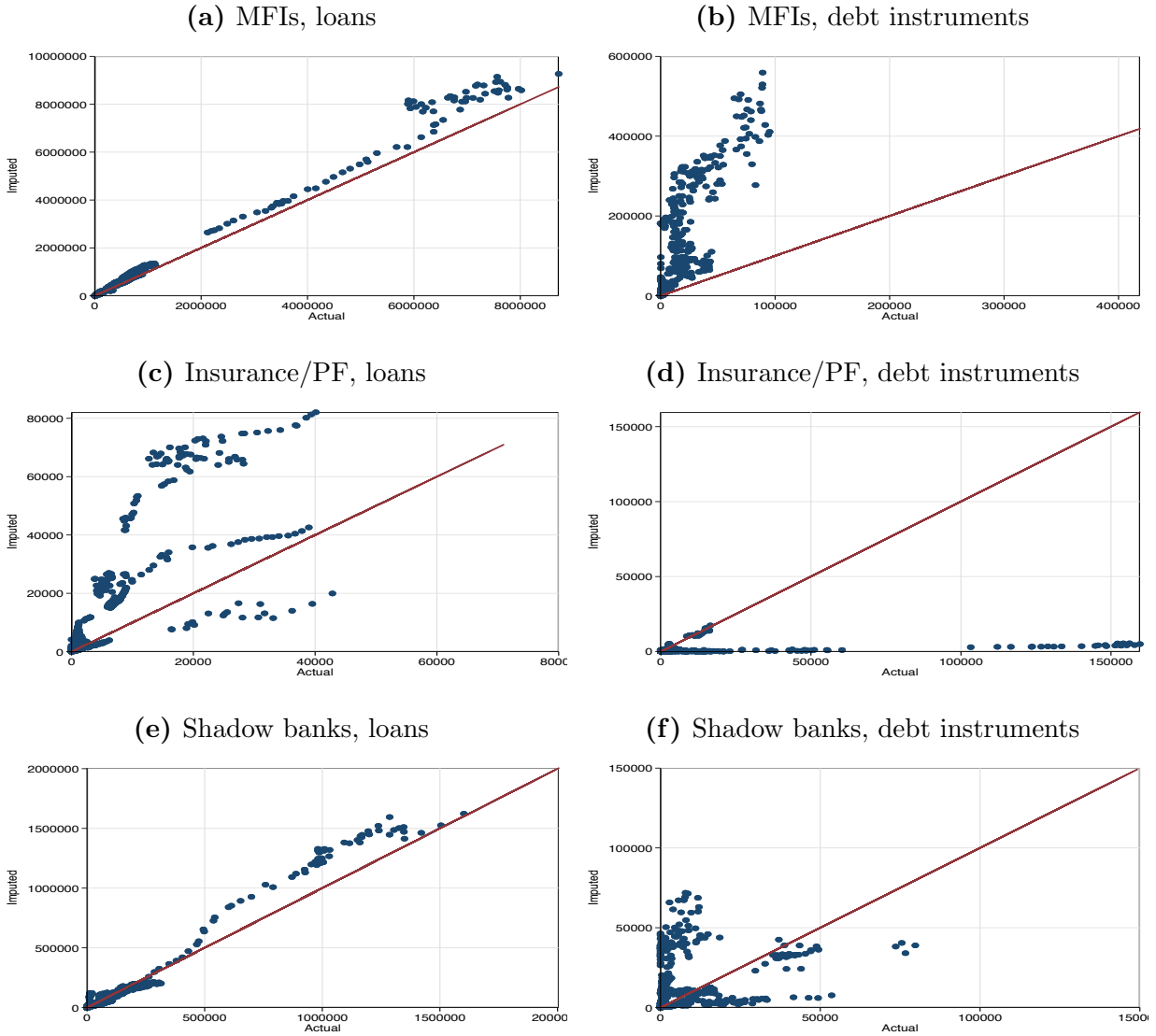


Table A.1: Relationship between changes in imputed and actual credit provision. This table reports the correlation between imputed and actual year-over-year changes in the loans to the non-financial corporate sector (A.4a) and debt instruments of the non-financial corporate sector (A.1b) for European Union countries excluding the United Kingdom. Changes reported in multiple of GDP terms. Correlations computed at the sector-country level. *** significant at 1%, ** significant at 5%, * significant at 10%.

(a) Loans			(b) Debt instruments		
	Actual	Imputed		Actual	Imputed
Actual	1		Actual	1	
Imputed	0.843***	1	Imputed	0.416***	1

Table A.2: Cyclicalities of sectoral prominence. This table reports the estimated coefficients β_s from the regression

$$\Delta \text{Sector share}_{s,c,t} = \alpha_c + \alpha_s + \alpha_{c,s} + \sum_{i=1}^4 \beta_i \text{Asset growth}_{c,t} \times \mathbb{1}_{s=i} + \epsilon_{s,c,t},$$

where $\Delta \text{Sector share}_{sct}$ is the year-over-year change in total assets of sector s as a fraction of the total assets of the aggregate financial sector in country c and quarter t , Asset growth is $\frac{\Delta A_{c,t}}{C_{c,t-4}}$, the ratio of the year-over-year change in total assets of the aggregate financial sector in country c to quarter t and nominal GDP measured for country c in quarter $t - 4$, and $\mathbb{1}_{s=i}$ is an indicator equal to 1 if sector s is the i^{th} subsector. “MFI” excludes the monetary authority, which is instead included in the “Shadow banks” sector. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, * significant at 10%.

	All	US	Canada	Australia	Japan
MFI \times Asset growth	-0.672 (0.162)***	-0.540 (0.232)**	-1.079 (0.185)***	-0.857 (0.413)**	-0.784 (0.182)***
Insurance and Pens. Fund \times Asset growth	-0.134 (0.097)	-0.824 (0.153)***	0.076 (0.153)	0.407 (0.311)	-0.294 (0.093)***
Shadow Banks \times Asset growth	0.835 (0.119)***	1.364 (0.171)***	1.003 (0.183)***	0.450 (0.175)**	1.078 (0.122)***
Households \times Asset growth	-0.348 (0.218)	1.358 (0.777)*	0.099 (0.390)	-0.677 (0.285)**	-0.931 (0.304)***
Adj. R^2	0.040	0.054	0.149	0.068	0.391
N. obs	2440	852	448	476	308

Table A.3: Cyclicalities of balance sheets across sectors. This table reports the estimated coefficients β_s from the regression

$$\text{Growth}_{sct} = \alpha_c + \alpha_s + \alpha_{cs} + \beta_s \text{Asset growth}_{sct} + \epsilon_{sct},$$

where Growth_{sct} is the year-over-year change in total assets (A.3a), total liabilities (A.3b), and financial equity (A.3c) of sector s in country c in quarter t . All changes measured in multiple of GDP terms. “MFI” excludes the monetary authority, which is instead included in the “Shadow banks” sector. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, * significant at 10%.

(a) Total assets

	All	US	Canada	Australia	Japan
MFI \times Real GDP growth	0.011 (0.015)	0.023 (0.008)***	-0.002 (0.014)	0.051 (0.028)*	0.044 (0.013)***
Insurance and Pens. Fund \times Real GDP growth	0.027 (0.006)***	0.018 (0.008)**	0.032 (0.016)**	0.040 (0.028)	0.020 (0.008)***
Shadow Banks \times Real GDP growth	0.041 (0.012)***	0.033 (0.019)*	0.081 (0.026)***	0.030 (0.022)	0.059 (0.031)*
Households \times Real GDP growth	0.099 (0.017)***	0.110 (0.041)***	0.080 (0.031)***	0.060 (0.031)*	0.067 (0.021)***
Adj. R^2	0.074	0.131	0.079	0.025	0.075
N. obs	2436	848	448	476	308

(b) Total liabilities

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.932 (0.011)***	0.931 (0.016)***	0.772 (0.094)***	0.910 (0.059)***	0.911 (0.039)***
Insurance and Pens. Fund \times Asset growth	0.962 (0.026)***	0.889 (0.025)***	1.013 (0.017)***	1.051 (0.016)***	0.591 (0.073)***
Shadow Banks \times Asset growth	0.978 (0.031)***	0.967 (0.013)***	1.068 (0.079)***	0.807 (0.040)***	1.008 (0.026)***
Households \times Asset growth	0.064 (0.018)***	0.049 (0.024)**	0.004 (0.020)	0.145 (0.066)**	-0.063 (0.093)
Adj. R^2	0.878	0.902	0.740	0.852	0.912
N. obs	2440	852	448	476	308

(c) Financial Equity

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.068 (0.011)***	0.069 (0.016)***	0.228 (0.094)**	0.090 (0.059)	0.089 (0.039)**
Insurance and Pens. Fund \times Asset growth	0.038 (0.026)	0.111 (0.025)***	-0.013 (0.017)	-0.051 (0.016)***	0.409 (0.073)***
Shadow Banks \times Asset growth	0.022 (0.031)	0.033 (0.013)**	-0.068 (0.079)	0.193 (0.040)***	-0.008 (0.026)
Households \times Asset growth	0.936 (0.018)***	0.951 (0.024)***	0.996 (0.020)***	0.855 (0.066)***	1.063 (0.093)***
Adj. R^2	0.824	0.959	0.655	0.732	0.827
N. obs	2440	852	448	476	308

Table A.4: Cyclicity of credit provision at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Credit growth}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \beta_s \text{Asset growth}_{sct} + \epsilon_{sct},$$

where Credit Growth $_{sct}$ is the year-over-year change in loans (A.4a), debt instruments (A.4b), and total credit (A.4c) provided by the sector s to the non-financial corporate sector in country c in quarter t , Asset growth $_{sct}$ is the year-over-year change in total assets of the sector s in country c in quarter t . All changes measured in multiple of GDP terms. “MFI” excludes the monetary authority, which is instead included in the “Shadow banks” sector. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, * significant at 10%.

(a) Loans

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.278 (0.029)***	0.065 (0.021)***	0.140 (0.041)***	0.259 (0.035)***	0.081 (0.039)**
Insurance and Pens. Fund \times Asset growth	0.011 (0.007)*	-0.000 (0.000)	-0.005 (0.005)	0.003 (0.002)	0.006 (0.011)
Shadow Banks \times Asset growth	0.028 (0.009)***	-0.000 (0.004)	-0.002 (0.021)	0.006 (0.016)	0.051 (0.020)**
Households \times Asset growth	0.004 (0.003)*	0.002 (0.001)**	0.000 (0.000)	0.000 (0.000)	0.003 (0.002)
Adj. R^2	0.557	0.120	0.093	0.615	0.098
N. obs	2430	842	448	476	308

(b) Debt Instruments

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.021 (0.005)***	0.029 (0.005)***	-0.002 (0.016)	0.062 (0.014)***	-0.002 (0.005)
Insurance and Pens. Fund \times Asset growth	0.015 (0.006)***	0.027 (0.015)*	0.040 (0.019)**	0.002 (0.003)	-0.002 (0.007)
Shadow Banks \times Asset growth	0.014 (0.003)***	0.010 (0.004)**	0.017 (0.006)***	0.012 (0.008)	0.002 (0.002)
Households \times Asset growth	-0.007 (0.002)***	-0.015 (0.003)***	0.001 (0.002)	-0.000 (0.000)	-0.004 (0.003)
Adj. R^2	0.103	0.142	0.103	0.243	-0.012
N. obs	2440	852	448	476	308

(c) Total credit

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.299 (0.027)***	0.093 (0.022)***	0.138 (0.033)***	0.321 (0.043)***	0.079 (0.041)*
Insurance and Pens. Fund \times Asset growth	0.026 (0.009)***	0.027 (0.015)*	0.035 (0.017)**	0.004 (0.004)	0.004 (0.011)
Shadow Banks \times Asset growth	0.043 (0.010)***	0.010 (0.005)**	0.015 (0.020)	0.018 (0.017)	0.053 (0.021)**
Households \times Asset growth	-0.003 (0.004)	-0.013 (0.003)***	0.001 (0.002)	-0.000 (0.000)	-0.001 (0.004)
Adj. R^2	0.594	0.189	0.099	0.622	0.097
N. obs	2440	852	448	476	308

Table A.5: Cyclicalities of portfolio allocation at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Credit share}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \beta_s \text{Asset growth}_{sct} + \epsilon_{sct},$$

where $\text{Credit share}_{sct}$ is the year-over-year change in loans (A.5a), debt instruments (A.5b), and total credit (A.5c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total assets of sector s , $\text{Asset growth}_{sct}$ is the year-over-year change in total assets of the sector s in country c in quarter t , measured as a multiple of GDP. “MFI” excludes the monetary authority, which is instead included in the “Shadow banks” sector. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, * significant at 10%.

(a) Loans

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.032 (0.207)	-0.142 (0.353)	0.528 (0.826)	1.307 (0.479)***	-0.323 (0.311)
Insurance and Pens. Fund \times Asset growth	-0.169 (0.109)	0.000 (0.000)	-0.497 (0.141)***	0.006 (0.097)	-0.841 (0.331)**
Shadow Banks \times Asset growth	-1.167 (0.193)***	-0.177 (0.092)*	-1.389 (0.286)***	-1.897 (0.623)***	-1.619 (0.455)***
Households \times Asset growth	-0.105 (0.037)***	0.003 (0.006)	-0.004 (0.003)	-0.000 (0.000)	0.020 (0.017)
Adj. R^2	0.082	-0.001	0.206	0.169	0.287
N. obs	2430	842	448	476	308

(b) Debt Instruments

	All	US	Canada	Australia	Japan
MFI \times Asset growth	-0.012 (0.049)	0.131 (0.121)	-0.326 (0.249)	0.284 (0.170)*	-0.124 (0.041)***
Insurance and Pens. Fund \times Asset growth	-0.360 (0.151)**	-0.944 (0.316)***	-0.219 (0.531)	-0.148 (0.097)	-0.935 (0.243)***
Shadow Banks \times Asset growth	-0.032 (0.048)	-0.183 (0.059)***	-0.001 (0.094)	-0.006 (0.201)	-0.050 (0.023)**
Households \times Asset growth	-0.100 (0.023)***	-0.169 (0.022)***	-0.050 (0.018)***	-0.007 (0.006)	-0.044 (0.019)**
Adj. R^2	0.011	0.109	-0.003	0.000	0.230
N. obs	2440	852	448	476	308

(c) Total credit

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.020 (0.196)	-0.011 (0.361)	0.202 (0.756)	1.592 (0.528)***	-0.448 (0.320)
Insurance and Pens. Fund \times Asset growth	-0.529 (0.182)***	-0.944 (0.316)***	-0.716 (0.448)	-0.142 (0.158)	-1.776 (0.425)***
Shadow Banks \times Asset growth	-1.199 (0.185)***	-0.360 (0.090)***	-1.389 (0.270)***	-1.903 (0.624)***	-1.669 (0.464)***
Households \times Asset growth	-0.205 (0.038)***	-0.165 (0.019)***	-0.054 (0.018)***	-0.007 (0.006)	-0.024 (0.031)
Adj. R^2	0.083	0.050	0.191	0.159	0.310
N. obs	2440	852	448	476	308

Table A.6: Cyclicity of share of credit provided at the sector level. This table reports the estimated coefficients β_s from the regression

$$\text{Share in total}_{sct} = \alpha_c + \alpha_s + \alpha_{sc} + \beta_s \text{Asset growth}_{ct} + \epsilon_{sct},$$

where $\text{Share in total}_{sct}$ is the year-over-year change in loans (A.6a), debt instruments (A.6b), and total credit (A.6c) provided by sector s to the non-financial corporate sector in country c in quarter t as a fraction of total loans, total debt instruments and total credit used by the non-financial corporate sector, respectively. Asset growth_{ct} is the year-over-year change in total assets of the aggregate financial sector country c in quarter t , measured as a multiple of GDP. “MFI” excludes the monetary authority, which is instead included in the “Shadow banks” sector. Newey-West standard errors with 4 lags reported in parentheses below the point estimates. *** significant at 1%, ** significant at 5%, * significant at 10%.

(a) Loans

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.875 (0.344)**	-1.187 (1.493)	5.190 (1.815)***	0.646 (0.947)	0.431 (0.424)
Insurance and Pens. Fund \times Asset growth	0.164 (0.128)	0.000 (0.000)	-0.100 (0.190)	0.129 (0.130)	-0.205 (0.063)***
Shadow Banks \times Asset growth	0.322 (0.271)	-0.237 (0.477)	0.389 (0.686)	-1.353 (0.561)**	0.466 (0.404)
Households \times Asset growth	0.151 (0.060)**	0.192 (0.090)**	0.012 (0.011)	0.000 (0.001)	0.064 (0.048)
Adj. R^2	0.019	-0.002	0.121	0.010	0.003
N. obs	2430	842	448	476	308

(b) Debt Instruments

	All	US	Canada	Australia	Japan
MFI \times Asset growth	1.068 (0.781)	3.408 (0.620)***	-0.342 (1.845)	3.748 (2.136)*	-2.050 (0.640)***
Insurance and Pens. Fund \times Asset growth	0.746 (0.735)	-0.188 (2.119)	3.961 (2.133)*	-0.064 (0.733)	3.056 (1.414)**
Shadow Banks \times Asset growth	1.350 (0.330)***	0.621 (0.358)*	1.644 (0.590)***	1.241 (1.517)	0.273 (0.179)
Households \times Asset growth	-0.837 (0.294)***	-1.750 (0.354)***	-0.019 (0.245)	-0.083 (0.069)	-0.538 (0.359)
Adj. R^2	0.028	0.116	0.082	0.045	0.051
N. obs	2440	852	448	476	308

(c) Total credit

	All	US	Canada	Australia	Japan
MFI \times Asset growth	0.992 (0.272)***	2.417 (0.757)***	3.753 (0.806)***	1.031 (0.929)	-0.097 (0.358)
Insurance and Pens. Fund \times Asset growth	0.318 (0.236)	1.391 (1.070)	1.233 (0.528)**	0.031 (0.196)	-0.203 (0.235)
Shadow Banks \times Asset growth	0.546 (0.214)**	0.111 (0.287)	0.645 (0.432)	-0.771 (0.560)	0.531 (0.425)
Households \times Asset growth	-0.343 (0.153)**	-0.851 (0.183)***	0.071 (0.063)	-0.021 (0.017)	-0.054 (0.083)
Adj. R^2	0.046	0.077	0.151	0.011	0.000
N. obs	2440	852	448	476	308