FSB FINANCIAL STABILITY BOARD

# Global Monitoring Report on Non-Bank Financial Intermediation 2019

19 January 2020

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# Executive summary

Non-bank financing is a valuable source of financing for many firms and households. It facilitates competition among financing providers and supports economic activity. Notwithstanding this, non-bank financing may become a source of systemic risk – both directly and through its interconnectedness with other parts of the financial system – if it involves activities that are typically performed by banks, such as maturity/liquidity transformation and the creation of leverage.

To assess global trends and risks in non-bank financial intermediation (NBFI), the Financial Stability Board (FSB) has been conducting an annual monitoring exercise since 2011.[1] This Report presents the results of the FSB's ninth such exercise. It covers data up to end-2018 from 29 jurisdictions, which together represent over 80% of global GDP.

A first part of the Report compares the size and trends of financial sectors in aggregate and across jurisdictions, primarily using sectoral balance sheet data.[2] The monitoring aggregates used throughout this Report – MUNFI (monitoring universe of non-bank financial intermediation), OFIs (other financial intermediaries) and the narrow measure of NBFI – are defined in Box 0-1 at the end of this Executive summary. The main observations are:[3]

- **MUNFI assets declined slightly to $183.7 trillion in 2018 compared to the previous year.** This decrease, the first since 2008, was driven by a decline in the assets of OFIs (by 0.4% to $114.3 trillion) associated with stock market declines towards the end of 2018 and, to a lesser extent, with outflows from some OFIs. These stock market declines reduced the value of financial assets held by investment funds (notably equity funds), although the market has since rebounded, generally reversing this trend.
- **Total global financial assets grew by 1.4% in 2018, driven largely by banks**. Assets of banks increased by 2.8% over this period, while assets of insurance corporations and pension funds remained largely unchanged.
- **Lending by OFIs has continued to grow, though banks remain the single largest source of credit intermediation.** OFI lending assets increased by 3.0% in 2018, largely driven by the euro area. In comparison, bank loans grew by 5.9%. Among OFIs, investment funds (predominantly fixed income funds) and finance companies held the biggest share of credit and lending assets respectively.
- **Repo assets and liabilities of OFIs increased in 2018, with the net repo position remaining largely unchanged.** Growth in repo assets of banks exceeded that of repo liabilities.

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1 In the 2018 Report, the FSB replaced the term "shadow banking" with "non-bank financial intermediation" (NBFI), to emphasise the forward-looking aspect of the FSB's work. This change in terminology did not affect either the substance or the coverage of the monitoring exercise.

2 Measures of growth throughout this Report are adjusted for exchange rate effects by applying a constant end-2018 exchange rate across all past years to convert data denominated in local currencies into US dollars. "Assets" refer to financial assets on an unconsolidated basis, where available.

3 These results are not strictly comparable to those presented in previous Reports, because of improvements in national statistics and more granular reporting.

- **Interconnectedness between banks and OFIs through credit and funding relationships has remained largely unchanged since 2016, after declining from its 2009 levels.** Investment funds and money market funds (MMFs) remain the largest OFI sub-sectors that provide credit to banks.

A second part of the Report focuses on the parts of NBFI that may pose bank-like financial stability risks and/or regulatory arbitrage. Non-bank financial entities are included in this so-called "narrow measure" if they perform one of the FSB's five economic functions (EFs). This assessment is conservative in its approach, by being both inclusive in scope[4] and reflecting the assumption that policy measures and/or risk management tools have not been exercised (ie on a pre-mitigant basis).

- **The narrow measure of NBFI grew by 1.7%, to $50.9 trillion in 2018**, significantly slower than the 2012-17 average annual growth rate of 8.5%. It now represents 13.6% of total global financial assets. Within the narrow measure non-bank financial intermediaries are categorised into the five EFs, summarised below (and presented in Exhibit 0-1):
  - **Collective investment vehicles (CIVs) with features that make them susceptible to runs (EF1) grew by 0.4% in 2018**, representing 72.0% of the narrow measure. This growth rate was much slower than the 11.0% average annual growth rate from 2012 to 2017. Two of the largest EF1 entity types, MMFs and fixed income funds, invest primarily in credit assets (reflecting their business models) and engage in liquidity and maturity transformation.
  - **Non-bank financial entities engaging in loan provision that is dependent on short-term funding (EF2) grew by 6.9% in 2018**, representing 7.0% of the narrow measure. Finance companies, the entity type most commonly classified into EF2, displayed a somewhat elevated degree of leverage, but have moderate maturity transformation in most jurisdictions.
  - **Market intermediaries that depend on short-term funding or secured funding of client assets (EF3) grew by 8.7% in 2018,** representing 8.8% of the narrow measure. Broker-dealers that are not prudentially consolidated into banking groups constitute the largest EF3 entity type; they employ significant leverage (reflecting their business models), particularly when accounting for off-balance sheet exposures. The leverage of these broker-dealers increased modestly in 2018 in most jurisdictions, but in aggregate remains lower than the levels seen in the lead up to the financial crisis.
  - Entities involved in **the facilitation of credit creation (EF4) grew by 5.0% in 2018, representing less than 1% of the narrow measure**. As in previous years, their size may be significantly understated due to the difficulty in capturing off-balance sheet exposures. Risk data were also sparse and difficult to interpret. Assets of investment funds involved in credit derivatives have increased in recent years, and accounted for the biggest share of EF4 assets in 2018.

[4] Non-bank financial entities are excluded from the narrow measure only if data are available and if the analysis of that data in accordance with the methodology and classification guidance used in the FSB's annual monitoring exercise provides sufficient grounds for exclusion. As a result, the narrow measure may overestimate the degree to which non-bank financial intermediation may give rise to financial stability risks. For details, see Section 4.

– **Entities engaged in securitisation-based credit intermediation (EF5), such as securitisation vehicles, remained unchanged in terms of nominal value in 2018, representing 9.3% of the narrow measure.** Assets of structured finance vehicles (SFVs), which include collateralised loan obligations (CLOs), grew by 9.7%, continuing the growth seen in 2017. However, this growth was offset by a decrease in the assets of Chinese trust companies, which fell by 21.7%.

## Monitoring aggregates *Box 0-1*

The following monitoring aggregates are referred to throughout this Report:

(i) **MUNFI** (monitoring universe of non-bank financial intermediation) is a broad measure of all NBFI, comprised of all financial institutions that are not central banks, banks or public financial institutions.

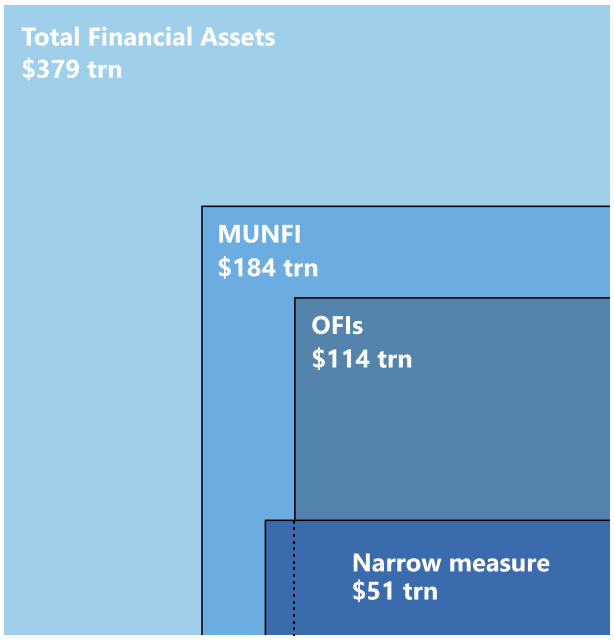
(ii) **OFIs** (other financial intermediaries) is a subset of MUNFI, comprised of all financial institutions that are not central banks, banks, public financial institutions, insurance corporations, pension funds, or financial auxiliaries.

(iii) **The narrow measure** (or "narrow measure of non-bank financial intermediation") is comprised of non-bank financial institutions that authorities have assessed as being involved in credit intermediation activities that may pose bank-like financial stability risks (ie credit intermediation that involves maturity/liquidity transformation, leverage or imperfect credit risk transfer) and/or regulatory arbitrage, according to the methodology and classification guidance used in the FSB's annual monitoring exercise.

Size of monitoring aggregates and composition of the narrow measure

At end-2018 Exhibit 0-1

Narrowing down[1]




Composition of the narrow measure[2]

| Economic Functions | Size (USD trillion) | Share (%) | Change in 2018 (%) |
|---|---|---|---|
| EF1 (*collective investment vehicles with features that make them susceptible to runs*) | 36.6 | 72.0 | 0.4 |
| EF2 (*lending dependent on short-term funding*) | 3.6 | 7.0 | 6.9 |
| EF3 (*market intermediation dependent on short-term funding*) | 4.5 | 8.8 | 8.7 |
| EF4 (*facilitation of credit intermediation*) | 0.3 | 0.6 | 5.0 |
| EF5 (*securitisation-based credit intermediation*) | 4.7 | 9.3 | 0.0 |
| Unallocated | 1.1 | 2.3 | 9.5 |
| **Total** | **50.9** | **100** | **1.7** |

[1] Total financial assets, MUNFI and OFIs are based on 21+EA Group; Narrow measure is based on the *29-Group*. [2] Net of prudential consolidation into banking groups. For additional details on these categories, see Section 4.

Source: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

# 1. Introduction

The comprehensive monitoring of global trends, risks, and innovations of NBFI is a key part of the FSB's efforts to enhance financial system resilience.[5] The FSB's monitoring exercise, currently based on data submitted by 29 jurisdictions[6] up to end-2018, uses sectoral balance sheet data from national financial accounts statistics ("flow of funds"), complemented with supervisory and other publicly available data where appropriate.[7]

The monitoring exercise adopts a practical two-step approach.[8] First, it takes a comprehensive look at MUNFI to seek to ensure that data gathering and surveillance covers all NBFI areas where risks to the financial system might potentially arise (see Section 2). As part of the comprehensive review of MUNFI, this Report then provides an assessment of the interconnectedness between different types of non-bank financial entities and banks, as well as cross-border linkages (see Section 3). The second step of the monitoring approach focuses on the subset of NBFI that may pose bank-like financial stability risks and/or regulatory arbitrage.[9] To arrive at this narrow measure of NBFI, the participating jurisdictions classify a subset of NBFI entities on the basis of their EFs (or activities) that may involve bank-like financial stability risks (ie credit intermediation involving liquidity/maturity transformation, leverage or imperfect credit risk transfer) (see Section 4).[10]

The inclusion of non-bank financial entities or activities in the narrow measure is based on a conservative (inclusive) assessment of the risks such entities or activities may pose, especially during stressed events. The conservative assessment has two features. First, non-bank financial entities are excluded from the narrow measure only if data are available and the analysis of the data and rationales for exclusion, in light of the methodology and classification guidance used in the FSB's annual monitoring exercise, provides sufficient

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5 The monitoring exercise is conducted by the FSB's Non-bank Monitoring Experts Group ("the Experts Group"), which was established in 2016 under the Standing Committee on Assessment of Vulnerabilities (SCAV). The Experts Group includes experts from all participating jurisdictions (see Exhibit 1-1), as well as the Bank for International Settlements, European Commission, European Securities and Markets Authority, European Systemic Risk Board, International Association of Insurance Supervisors, International Monetary Fund, International Organization of Securities Commissions and the Organisation for Economic Co-operation and Development.

6 The geographical scope of the monitoring exercise may be broadened in the future to include additional jurisdictions. Relatedly, the FSB Regional Consultative Group for the Americas (RCGA) has been conducting its own regional non-bank financial intermediation monitoring exercise since 2012, using the FSB's monitoring approach. See FSB RCGA (2018) for the results of its 2018 exercise.

7 The FSB's NBFI monitoring exercise uses sectoral balance sheet statistics as these are widely available and provide generally consistent financial sector data for mapping the global size and trends of NBFI. Some jurisdictions that currently lack sectoral balance sheet statistics have used other data sources which may not be fully consistent with the data from other participating jurisdictions. Jurisdictions that are already using sectoral balance sheet statistics are encouraged to further improve their granularity, where needed, while those that have not yet implemented official sectoral balance sheet statistics are encouraged to develop them.

8 The practical two-step approach in this Report is based on the monitoring framework to assess bank-like financial stability risks from NBFI as set out in FSB (2011).

9 See FSB (2011).

10 The focus on economic functions is based on an approach that was introduced in the FSB's high-level *Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities* (the "FSB Policy Framework"), published in 2013. See FSB (2013b).

grounds for exclusion by participating jurisdictions. Second, classification is done on a pre-mitigant basis – that is classifying authorities are asked to assume a scenario in which policy measures have not been adopted and/or risk management tools are not exercised. The inclusion of non-bank financial entities or activities does not constitute a judgement that policy measures applied to address the financial stability risks of those entities and activities are inadequate or ineffective, nor does it necessarily reflect a judgement that there is regulatory arbitrage. The conservative and pre-mitigant approach helps to improve data consistency across jurisdictions. As a result, the narrow measure may overestimate the degree to which NBFI currently gives rise to post-mitigant financial stability risks.[11]

In addition to assessing the data collected annually, experts from participating authorities also discuss various topics regarding non-bank financial entities and activities in greater detail. This Report includes the following case studies on three topics: (i) distinguishing between flow and valuation effects in the investment fund sector; (ii) the role of non-bank financial institutions in providing financing to commercial real estate (CRE); and (iii) the role of investment funds in cross-border capital flows (see Section 5). As part of the forward-looking aspect of the monitoring exercise, jurisdictions also detail recent NBFI-related innovations in their jurisdiction (see Box 1-1).

**Recent innovations in NBFI** **Box 1-1**

As a part of the forward-looking aspect of its annual monitoring exercise, the FSB collects information on recent innovations from participating jurisdictions. This information is shared among jurisdictions, discussed within the Experts Group and, when appropriate, reported to senior FSB committees.

For the 2019 monitoring exercise, jurisdictions were asked to report whether five specific innovations were present in their jurisdictions and to report any additional innovations.

The 26 jurisdictions that responded reported these specific innovations:

- Twenty-three jurisdictions reported peer-to-peer (P2P) lending - the most common innovation identified - which remains very small but is growing rapidly. Data collection is at an early stage and remains limited.[12]
- Fourteen jurisdictions reported the presence of CLOs.[13]
- Nine jurisdictions reported some involvement of investment funds (eg bank-loans funds), SPVs, pension funds, and insurers in leveraged loan markets. Bank-loan funds in the US experienced large outflows in December 2018 but were able to meet redemptions.
- Six jurisdictions reported crowdfunding to raise mortgage down payments and five jurisdictions reported crypto-asset based lending, noting that both remain small in size.

[11] For example, although MMFs and fixed income funds are included in the narrow measure, the existing policy measures or risk management tools for them may have addressed or significantly reduced financial stability risks, so that additional policy responses may not be currently warranted.

[12] In a case study included in the 2018 Report, P2P lending referred to matching platforms. However, it was also noted in that report that there is little consistency across jurisdictions in the definitions used for FinTech credit activities.

[13] See FSB (2019) for more detail on data availability with respect to CLOs.

Members also identified these additional innovations:

- *Blockchain-based bond issuance*: One jurisdiction mentioned the licensing of a Securities Token Offering (STO). The offering was for the issuance of unsecuritised qualified subordinated token-based bonds with a maximum total nominal amount of €100 million and a term of June 2029.
- *Buy now pay later* (BNPL) service providers were reported to have increased in one jurisdiction. BNPL providers offer loans for the purchase of goods and services from participating retailers, which the borrower pays back over time. These arrangements differ from regular credit provision as customers are not charged interest on their balance, and often do not pay an establishment fee. Instead, providers receive income through late fees charged to borrowers if they fail to meet scheduled repayments, as well as through commissions charged to the seller of the goods and services.
- *Securitisations collateralised by commercial real estate* were reported by one jurisdiction. *Commercial real estate collateralised loan obligations (CRE CLOs)* are issued with floating interest rates and final maturities of two to three years. CRE CLOs are collateralised mostly by first-lien mortgages on properties that are undergoing renovations or other significant transitions.

Each year, the FSB aims to improve the annual monitoring exercise by deepening its analysis and learning from the experiences of previous exercises. For example, in the 2019 monitoring exercise, additional data were collected in a number of areas as part of the ongoing implementation of the recommendations made in the FSB report, *Assessment of shadow banking activities, risks and the adequacy of post-crisis policy tools to address financial stability concerns*, submitted to the July 2017 Hamburg G20 Summit.[14] The additional data include data on interconnectedness with the household sector, non-financial corporate sector, and the government. Risk metrics data were also enhanced by collecting time series data, starting in 2002, although further improvement is needed. Separately, data definitions in the reporting templates were improved to enhance the consistency of data submitted and the assessments made by jurisdictions.[15] The FSB regularly assesses the effectiveness of these improvements and makes adjustments as needed to further improve its understanding of NBFI and associated bank-like financial stability risks.

To maximise both the scope and granularity of available data, the monitoring results are presented for two different samples of jurisdictions, which differ in terms of the treatment of euro area (EA) jurisdictions. The first sample, denoted as *29-Group*, comprises 29 individual jurisdictions and has better granularity of non-bank financial sectors. The second sample, denoted as *21+EA-Group*, is more comprehensive in terms of jurisdictional coverage because it not only comprises 21 individual non-euro area jurisdictions, but also

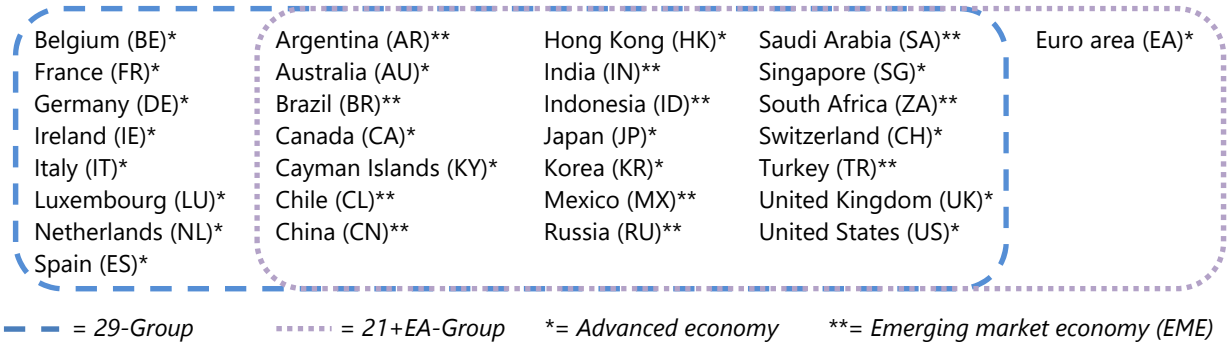
[14] See FSB (2017c).

[15] Achieving consistency in the EF classification framework is an iterative process. The classification guidance used in the FSB's annual monitoring exercise is regularly refined to reflect improvements in data availability, assessment of non-bank financial entities' involvement in the different EFs, and financial market developments such as the emergence of new entity types or risks.

includes the 19-member euro area as a whole, as opposed to only eight euro area jurisdictions in the *29-Group*.[16] As in previous Reports, the *29-Group* sample is used in Section 4 of this Report because of its greater granularity, while the *21+EA-Group* is used in parts of Sections 2 and 3, where it is equally granular, but provides wider jurisdictional coverage.

Data sample composition

Exhibit 1-1




Measures of growth and results throughout this Report are based on either annual historical data covering end-2002 to end-2018 or cross-sectional data as at end-2018. Some exchange rate effects have been corrected for when presenting growth rates by applying a constant end-2018 exchange rate across all past years to convert each jurisdiction's local currency data into US dollars. Growth rates have not been otherwise adjusted (eg for the appreciation or depreciation of asset prices). The results in this Report are not strictly comparable to those presented in previous Reports as a result of improvements in national statistics and more granular reporting.

[16] The European Central Bank (ECB) provided the euro area aggregated data. The euro area jurisdictions are Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain.

# 2. Macro-mapping of all non-bank financial intermediation

This section provides an overview of the size and growth of key parts of the global financial system, with a focus on OFIs and their involvement in credit intermediation and reliance on wholesale funding.[17] The key takeaways are:

- Total global financial assets grew by 1.4% in 2018, driven largely by banks. Assets of banks increased by 2.8% over this period, while assets of insurance corporations and pension funds remained largely unchanged.
- MUNFI assets declined slightly to $183.7 trillion in 2018 compared to the previous year. This decrease, which was the first since 2008, was driven by a decline in the assets of OFIs (by 0.4% to $114.3 trillion) associated with stock market declines towards the end of 2018 and, to a lesser extent, with outflows from some OFIs. These stock market declines reduced the value of financial assets held by investment funds (notably equity funds), although the market has since rebounded, generally reversing this trend.
- Lending by OFIs has continued to grow, though banks remain the single largest source of credit intermediation. OFI lending assets increased by 3.0% in 2018, largely driven by the euro area. In comparison, bank loans grew by 5.9%. Among OFIs, investment funds (predominantly fixed income funds) and finance companies held the biggest share of credit and lending assets respectively.
- Repo assets and liabilities of OFIs increased in 2018, with the net repo position remaining largely unchanged. Growth in repo assets of banks exceeded that of repo liabilities.

## 2.1. Overview of trends

In 2018 total global financial assets of all financial entities ("total global financial assets") grew by 1.4% to $378.9 trillion in the *21+EA-Group*. While the annual growth rate of bank assets[18] increased moderately from 2.2% in 2017 to 2.8% in 2018, the annual growth rate of other major financial sectors slowed (Exhibit 2-1). MUNFI assets remained relatively unchanged in 2018, with a small decline of 0.1% to $183.7 trillion, declining for the first time since 2008. As a result, the share of global financial assets held by banks increased moderately, whilst the share of OFIs assets (which comprise the biggest share of MUNFI assets) declined slightly. Financial auxiliaries (which comprise the smallest share of MUNFI assets) grew the fastest.

OFI assets decreased slightly by 0.4% to $114.3 trillion in 2018 after years of strong growth (Exhibit 2-2). This decline, the first since 2008, was associated with stock market declines in December 2018 and to a lesser extent with outflows from some OFIs. The stock market

[17] Eighteen jurisdictions currently use sectoral balance sheet statistics in their data submissions. Jurisdictions that currently lack sectoral balance sheet statistics have used other data sources (eg publicly available information, supervisory data) which may not be fully consistent with the data from other participating jurisdictions.

[18] Defined as all deposit-taking corporations.

declines reduced the value of equities held by investment funds (notably equity and mixed funds). Global markets, however, rebounded in early 2019[19] which partly reversed this trend.

The size and share of financial assets held by insurance corporations and pension funds remained largely unchanged. Thus, their year-over-year growth rates in 2018 were significantly below the average annual growth rates for those sectors between 2012 and 2017.

Macro-mapping of the financial system

*21+EA-Group*

Exhibit 2-1

| | Total global financial assets | Central banks | Banks | Public financial institu-tions | MUNFI | Insurance corpora-tions[1] | Pension funds | OFIs | Financial auxiliaries[2] |
|---|---|---|---|---|---|---|---|---|---|
| **Size at end-2018** (USD trillion) | 378.9 | 30.1 | 147.9 | 17.3 | 183.7 | 32.9 | 35.6 | 114.3 | 1.0 |
| **Share of total global financial assets** (%) | 100.0 | 7.9 | 39.0 | 4.6 | 48.5 | 8.7 | 9.4 | 30.2 | 0.3 |
| **Growth in 2018** (year-over-year, %) | 1.4 | 2.5 | 2.8 | 3.2 | -0.1 | 0.2 | 0.4 | –0.4 | 8.8 |
| **Growth 2012-17** (annualised growth, %) | 5.9 | 8.5 | 3.4 | 4.7 | 7.8 | 5.5 | 6.3 | 9.0 | 8.8 |

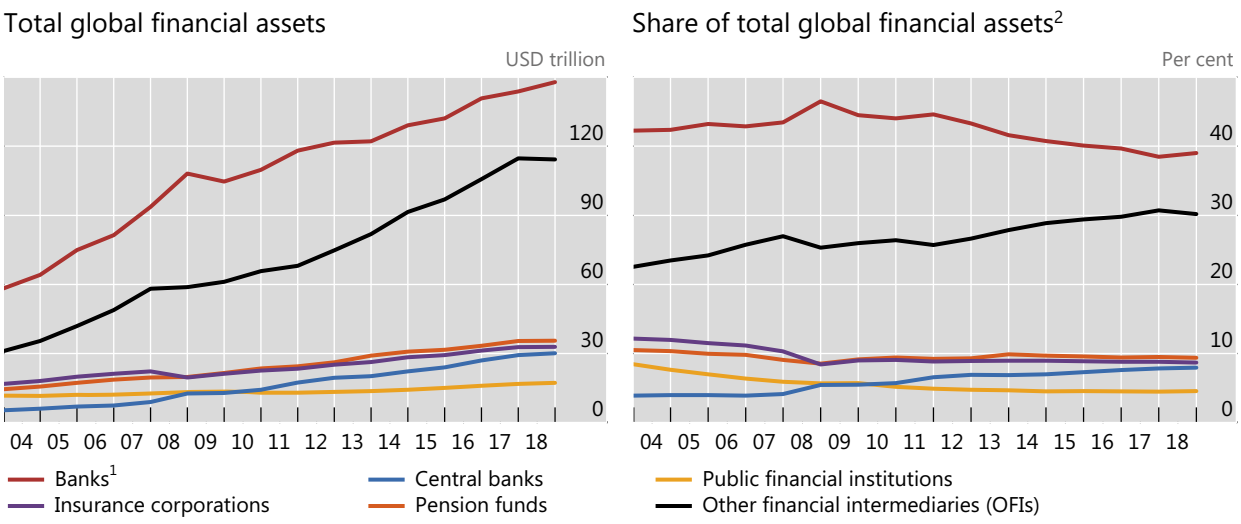
[1] For some jurisdictions, data on insurance corporations include separate accounts. [2] Financial auxiliaries are institutional units principally engaged in serving financial markets, but do not take ownership of the financial assets and liabilities they handle (SNA 2008). The figures for financial auxiliaries excludes the euro area due to reporting constraints.

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

Assets of financial intermediaries

*21+EA-Group*

Exhibit 2-2




[1] All deposit-taking corporations. [2] Weighted average based on total national financial assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

[19] For more details on this rebound see, for example, BIS (2019).

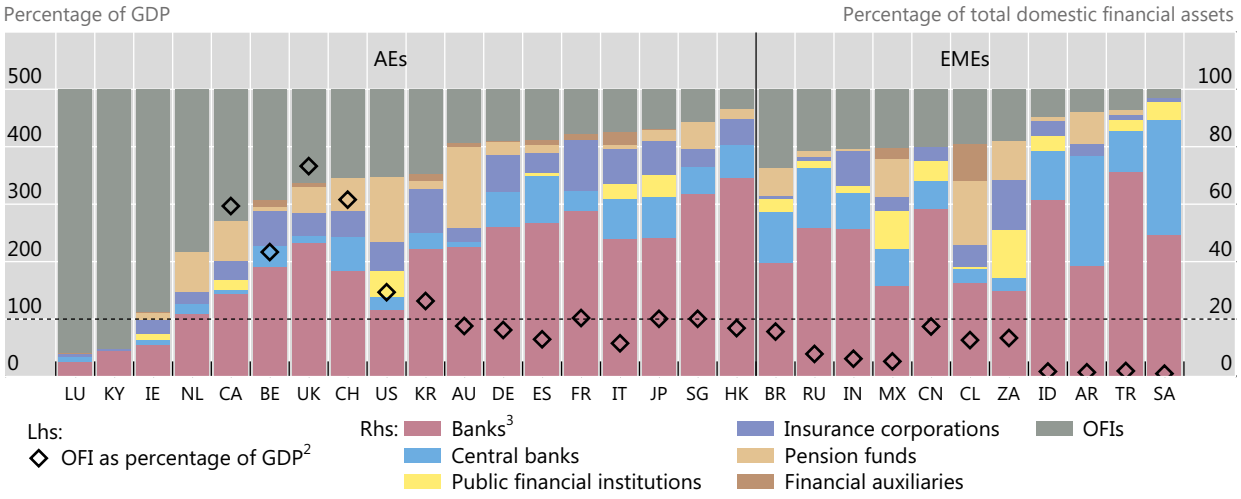
The composition of the financial system varies across jurisdictions. For example, banks are the largest single sector of the financial system in 22 jurisdictions of the 29-Group (Exhibit 2-3). However, MUNFI (as a combination of non-bank sectors) represents more than 50% of the financial system in 11 of those jurisdictions, with OFIs typically comprising the largest share. In other jurisdictions still, namely Australia, the US and some EMEs, pension funds constitute an important share of the financial system. Central banks hold a relatively large share of financial assets in two jurisdictions (Argentina and Saudi Arabia).

In addition, several jurisdictions' OFI sectors are – as in previous years – very large compared to their GDP. For example, OFI assets were 1,485 times GDP in the Cayman Islands and, within the euro area, 236 times GDP in Luxembourg, 13 times GDP in Ireland, and seven times GDP in the Netherlands.[20] In these jurisdictions the largest OFI sub-sectors are usually investment funds and/or captive financial institutions and money lenders (CFIMLs) with limited linkages to their respective domestic economies. For example, the majority of the assets of investment funds in the Cayman Islands are managed and/or marketed outside of the jurisdiction, particularly in the US.

Composition of financial systems[1]

*29-Group* at end-2018.

Exhibit 2-3




[1] Assets invested in foreign jurisdictions may distort these ratios. [2] Jurisdictions with OFIs assets greater (lower) than their GDP will be above (below) the horizontal dashed line. The ratio of OFI assets to GDP for Luxembourg (23,631), the Cayman Islands (148,540), Ireland (1323) and the Netherlands (760) are not shown since they are particularly high compared to the rest of the jurisdictions. [3] All deposit-taking corporations.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## 2.2. MUNFI trends

This section takes a closer look at overall trends in the main MUNFI sectors, first focusing on OFIs and its 10 core sub-sectors,[21] and then providing a brief update on insurance corporations and pension funds.

[20] No other jurisdictions have OFI sectors larger than five times their GDP.

[21] Individual jurisdictions reported additional sectors where applicable. Many OFI entities are also entities that authorities included in the five economic functions as part of the narrow measure (See Section 4).

### *2.2.1 Other financial intermediaries (OFIs)*

#### *(i) Global trends and developments across jurisdictions*

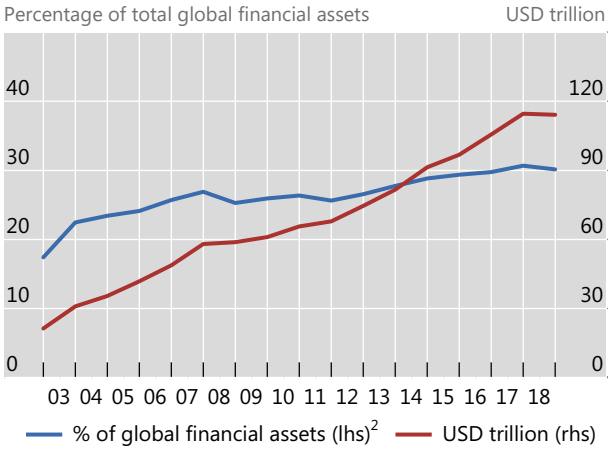
In 2018, OFI assets decreased slightly (0.4%) to $114.3 trillion, after several years of strong growth (Exhibit 2-1 and Exhibit 2-4, LHS). Declines in OFI assets in some advanced economies, such as the US ($697.4 billion or 2.3%), Luxembourg ($532.0 billion or 3.3%) and the Netherlands ($442.0 billion or 6.2%) were partially offset by growth in most other jurisdictions. Overall, OFI assets' growth in 2018 was considerably slower than their average annual growth rates between 2012 and 2017 in the majority of jurisdictions, with the exception of India (Exhibit 2-5).

The decrease in OFI assets mostly reflects asset valuation declines towards the end of 2018 that negatively impacted investment funds' assets, particularly equity funds, as well as transactions (net outflows) that negatively affected other OFI sub-sectors. For example, financial assets of US OFIs declined by 2.3% in 2018 to $30.0 trillion, largely due to a 9% decline in financial assets held by equity funds. This Report does not adjust for changes in valuation, so this year-over-year decline should be largely attributable to stock market valuation falls. In Luxembourg, investment fund assets saw a 2.1% decline in 2018 to $4.4 trillion, even though the sector continued to experience investor inflows. However, the bulk of the OFI asset decline in Luxembourg was due to outflows in the CFIML sector. Similarly, the decline of OFI assets in the Netherlands was primarily caused by transactions (net outflows), where valuation effects were limited to around 14% of the total decline.

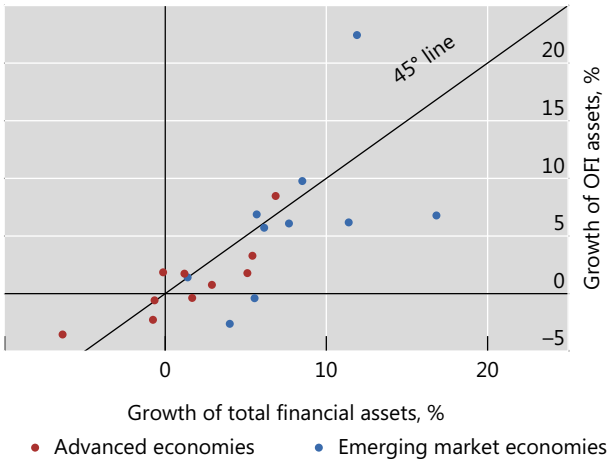
OFIs assets

*21+EA-Group* Exhibit 2-4

Financial assets of OFIs[1]




Growth rate in 2018[3]

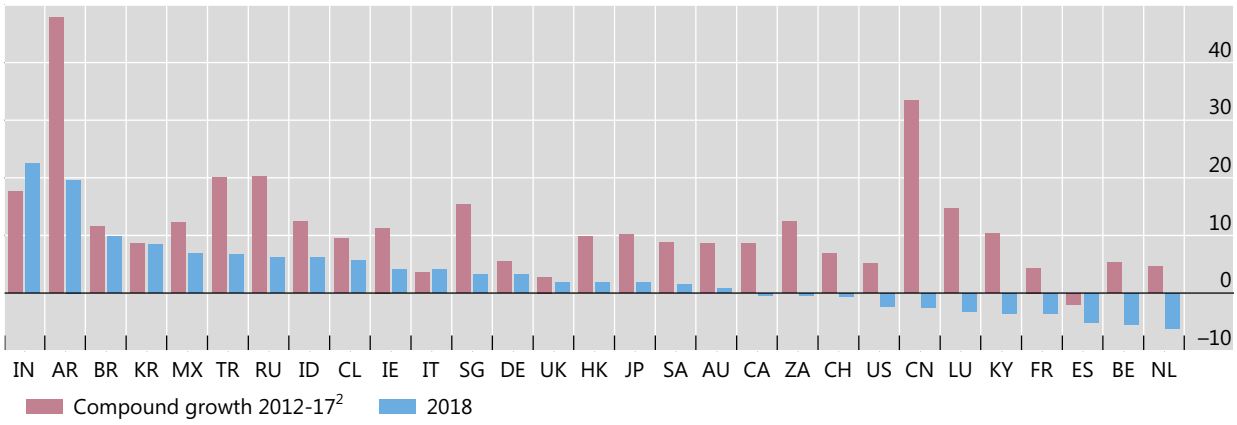



[1] Increases in assets may also reflect improvements in the availability of data over time at a jurisdictional level. [2] As a weighted average of total global financial assets. [3] Growth rates in Argentina reflect a high rate of inflation, and are outside the depicted range.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); IMF, *World Economic Outlook*; FSB calculations.

## Annual growth of OFI assets[1,2]

By jurisdiction, in per cent — Exhibit 2-5




Changes in aggregated data may also reflect improvements in the availability of data over time and inflation.

[1] Growth rates in Argentina reflect a high rate of inflation. [2] Growth rates for China are from 2013-17, and for Russia are from 2014-17.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

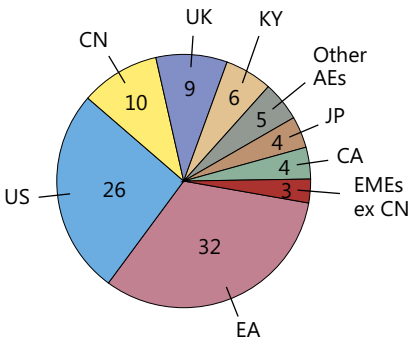
OFI assets continued to grow in 18 jurisdictions, most notably in EMEs. For example, as noted earlier, OFI assets in India grew by 22.4% with finance companies and investment funds contributing to 60% and 35% of that growth, respectively. In addition, investment funds in Brazil, SFVs in Ireland, trust companies in Korea, and CFIMLs in the UK also grew significantly.

The share of global OFI assets of EMEs has increased over time, with China being the third-largest jurisdiction in terms of OFI assets at $11.2 trillion in 2018, following the euro area and the US (Exhibit 2-6, RHS).

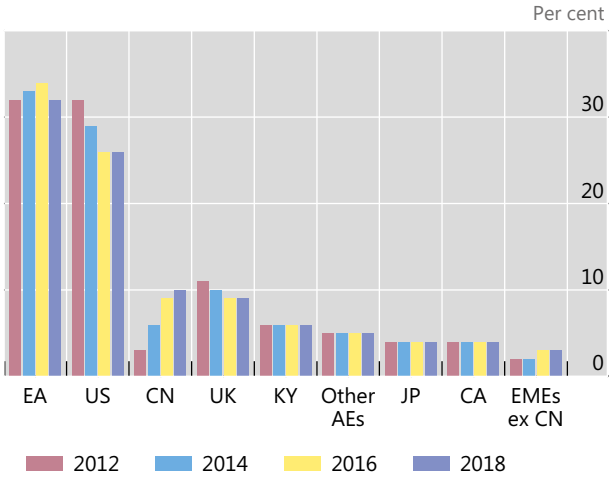
## Share of global OFI assets

*21+EA-Group* — Exhibit 2-6

At end-2018, in per cent




Historical evolution of shares by jurisdiction[1]




Other AEs include AU, CH, HK, KR and SG. EMEs ex CN include AR, BR, CL, ID, IN, MX, RU, TR, SA and ZA.

[1] Changes in aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level.

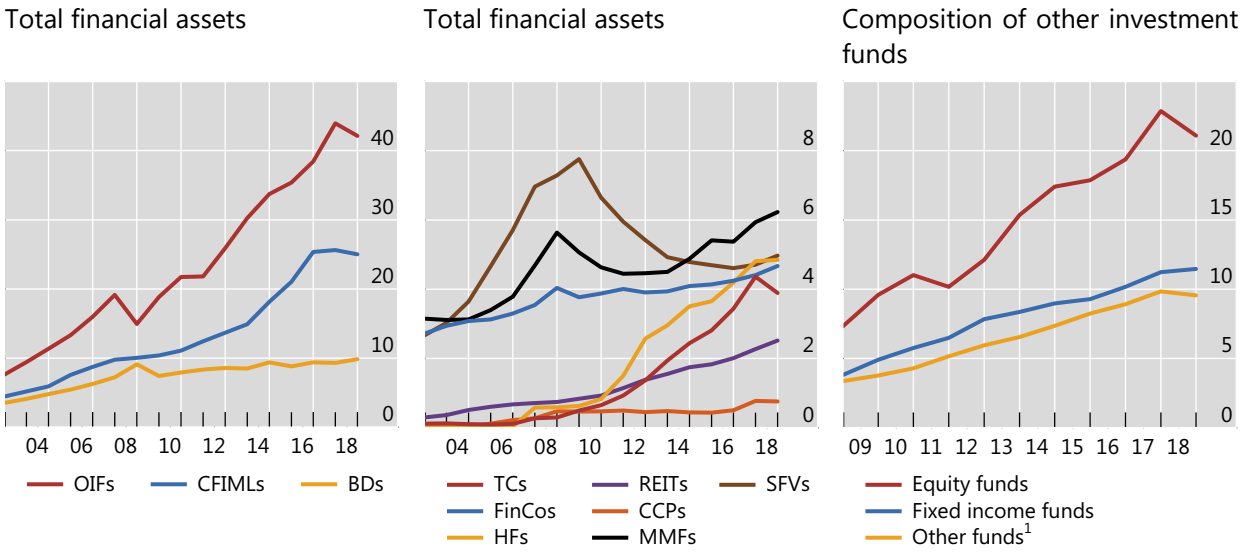
Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(ii) OFI sub-sectors*

Despite a reduction in assets at the end of 2018, other investment funds (OIFs – or investment funds other than MMFs and hedge funds) remain the largest OFI sub-sector in 2018, followed by CFIMLs (Exhibits 2-7 and 2-8). Real estate investment trusts and real estate funds (REITs) continued their strong growth in 2018 and represented the fastest growing OFI sub-sector, while finance companies and broker-dealers grew at a higher rate than historical averages. Furthermore, in 2018 SFVs grew for the second consecutive year and at an accelerated pace compared to 2017 (the first year of growth since the global financial crisis). Meanwhile, trust companies, investment funds and CFIMLs saw declines in 2018 after several years of strong growth. Exhibit 2-9 describes recent developments in the 10 main OFI sub-sectors. Box 2-1 discusses recent developments for a specific equity fund, the Woodford Equity Income Fund.

OFIs sub-sectors - Total financial assets

*29-Group*, in USD trillion — Exhibit 2-7




BDs = broker-dealers; CCPs = central counterparties; CFIMLs = captive financial institutions and money lenders; FinCos = finance companies; HFs = hedge funds; MMFs = money market funds; OIFs = investment funds other than MMFs and hedge funds; REITs = real estate investment trusts and real estate funds; SFVs = structured finance vehicles; TCs = trust companies.

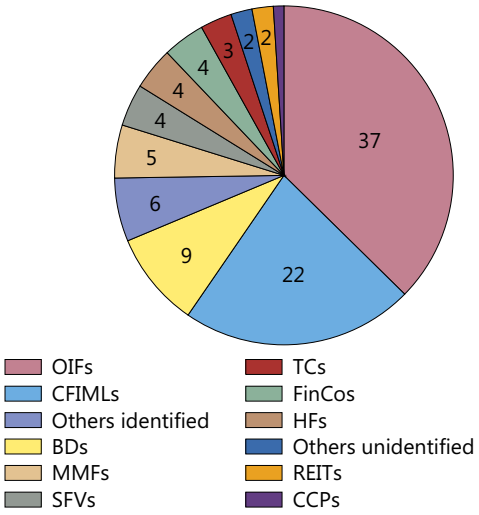
[1] Other funds include mixed funds, referenced investment funds, external debt investment funds, currency funds, asset allocation funds, other closed-ended funds, funds of funds, etc.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

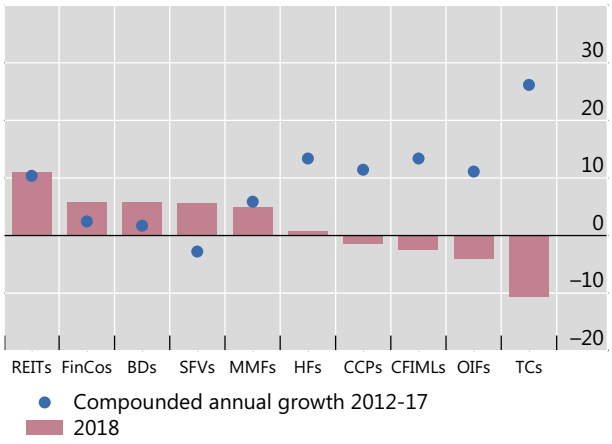
## Major OFI sub-sectors

*29-Group* Exhibit 2-8

At end-2018, in percentage of total OFI assets




Annual growth[1]




FinCos = finance companies; HFs = hedge funds; OIFs = investment funds other than MMFs and hedge funds; TCs = trust companies. 'Others identified' comprise a variety of jurisdiction-specific entities that do not fit any of the explicit categories included in the monitoring exercise.

[1] Changes in aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## Recent developments in OFI sub-sectors

*29-Group* Exhibit 2-9

| Sub-sector | Size, share of global OFI assets, change in 2018 | Update |
|---|---|---|
| Investment funds (other than MMFs and hedge funds) | $42.1 trillion, 37.0% share, 4.1% decline | In 2018, investment fund financial assets declined 4.1% to $42.1 trillion. Equity funds declined by 7.7% to $21.1 trillion, accounting for most of the overall decline. Yet, equity funds assets grew in eight jurisdictions, most notably in Brazil, India and Japan. Fixed income funds grew by 2.0% to $11.5 trillion, whereas other investment funds declined by 2.9% to $9.5 trillion (Exhibit 2-10).<br>The US and the eight participating euro area jurisdictions continued to account for the majority of investment fund assets, representing about 43% and 28% of global investment fund assets, respectively. |
| Captive financial institutions and money lenders (CFIMLs) | $25.0 trillion, 21.9% share, 2.5% decline | Four jurisdictions (Canada, Luxembourg, the Netherlands and the UK) account for 80% of global CFIML assets. CFIML assets declined in most jurisdictions. For example, in the Netherlands, CFIMLs fell by $300 billion or 5.8%.[22] In contrast CFIMLs saw growth in China, the UK and the US. |

[22] In the Netherlands, CFIMLs consist mainly of Special Financial Institutions (SFIs, or Special Purpose Entities), that are subsidiaries of foreign multinationals which have little or no physical presence in the Netherlands in terms of offices or staff; they are used almost exclusively for the pass-through of capital.

| | | |
|---|---|---|
| Broker-dealers[23] | $9.9 trillion, 8.6% share, 5.8% growth | Broker-dealers remain concentrated in the US (34%), the UK (29%) and Japan (17%). The growth in 2018 was driven mostly by these jurisdictions and China, but broker-dealers in 16 of the other 23 reporting jurisdictions also grew in size. However, in the Netherlands, broker-dealers' assets fell by 89%.[24] Broker-dealers' trends and risks are discussed in more detail in Section 4.6 on EF3. |
| MMFs | $6.2 trillion, 5.5% share, 5.0% growth | MMFs continued its growth trend with assets increasing above their pre-crisis level. All MMFs were classified into EF1, and are discussed in Section 4.4 in more detail. |
| Hedge funds[25] | $4.8 trillion, 4.3% share, 0.8% growth | Hedge funds' assets grew in Cayman Islands, Ireland and Turkey in 2018, offsetting declines in most reporting jurisdictions. China saw the largest decline, while hedge funds' assets also declined moderately in 10 other jurisdictions. Around 80% of reported global hedge fund assets are in the Cayman Islands.[26] |
| Structured finance vehicles (SFVs) | $5.0 trillion, 4.4% share, 5.7% growth | SFV assets increased for the second consecutive year and at an accelerated pace compared to 2017 (the first year of growth since the global financial crisis). This growth was mostly observed in several of the participating euro area jurisdictions (in particular, Ireland and Italy), but growth was also observed in China, Korea and the UK. China, Ireland and Italy contributed nearly 80% of the overall growth, while China had the fastest growth (56%). More than 70% of SFVs' assets were classified into EF5; the rest were either classified into EF4, prudentially consolidated into banking groups or excluded from the narrow measure. SFVs' trends and risks are discussed in more detail in Section 4.8 on EF5. |
| Trust companies | $3.9 trillion, 3.4% share, 10.7% decline | China accounted for 85% of trust company assets, which declined 14% in 2018 after more than a decade of strong growth. Section 4.8 provides more detail on this decline and its impact on EF5.[27] |
| Finance companies | $4.7 trillion, 4.1% share, 5.9% growth | While the US and Japan continued to have the largest finance company sectors (at 32% and 14% of global finance company assets, respectively), finance companies in EMEs grew the fastest, at 8.3% in 2018. This growth was driven mostly by India, where finance company assets increased by $92 billion to reach $506 billion in 2018 (12% of global finance companies assets). Finance companies' trends and risks are discussed in more detail in Section 4.5 on EF2.[28] |

[23] This category not only includes broker-dealers, but also other entities with similar structures, such as securities dealers and money market dealers.

[24] This large fall was caused by the termination - due to a restructuring - of a large investment firm which solely acted on behalf of Dutch pension funds.

[25] Hedge funds typically have more flexible investment strategies than mutual funds. Since they are usually marketed by way of "private placement" to sophisticated, institutional or professional investors, they are often not subject to some regulations designed to protect retail investors.

[26] There is no separate licensing category for hedge funds incorporated in the Cayman Islands, thus the Cayman Islands Monetary Authority (CIMA) estimated their size based on certain characteristics (eg leverage).

[27] See Box 2-5 in FSB (2018a) for an overview of trust companies in China.

[28] For details on non-bank finance companies in India, see RBI (2017).

| | | |
|---|---|---|
| Real estate investment trusts and real estate funds (REITs) | $2.5 trillion, 2.2% share, 11.1% growth | Equity REIT assets, which are 60% larger than mortgage REIT assets, grew by 8.2% in 2018, driven by growth in France, Korea and Singapore. However, mortgage REITs exhibited growth of 14.4% driven by the Netherlands and the US. Growth in the Netherlands was due to pension funds investing in residential mortgages through mortgage REITs. |
| Central counterparties (CCPs) | $0.8 trillion, 0.7% share, 1.4% decline | CCPs were reported by 12 jurisdictions.[29] The small decline in CCP assets was largely driven by Spain and the UK, although in total seven jurisdictions saw a decrease in assets. |

**Woodford Equity Income Fund - Recent developments** **Box 2-1**

**Background**

The LF Woodford Equity Income Fund (WEIF) has been the subject of significant investor and media interest since it suspended redemptions on 3 June 2019. While this situation has highly idiosyncratic features, it highlights the potential vulnerabilities that may arise if certain open-ended funds with significant investments in illiquid assets experience unanticipated redemptions.[30]

The WEIF is a UK-authorised Undertakings for the Collective Investment in Transferable Securities (UCITS) sub-fund, first approved by the UK Financial Conduct Authority (FCA) in 2014. The WEIF's Authorised Fund Manager (AFM) Link Fund Solutions (LFS) delegated portfolio management to Woodford Investment Management, a UK-authorised firm, and appointed Northern Trust Global Services (NT) as the Fund's depositary.

As the AFM, LFS is accountable for the fund's compliance with applicable rules in the UK, including those deriving from the EU UCITS Directive.

At its peak in May 2017 the fund's assets under management (AUM) was £10.8 billion, representing less than 1% of total AUM in the UK. At the time of its suspension, the WEIF had AUM of £3.7 billion, representing around 0.33% of UK AUM.

**Events leading to Suspension of Redemptions**

EU UCITS rules limit the amount of unlisted securities allowed to be held in a fund portfolio to 10%. In February and again in March 2018, WEIF breached this limit. LFS notified the FCA that it had resolved these breaches and reported exposure at less than 10%. The FCA thereafter began to closely monitor the WEIF's liquidity position and to have monthly engagement with its AFM.

Following the initial breach, LFS tightened its liquidity management measures for the WEIF. This involved breaking down the WEIF portfolio into liquidity buckets, each containing a

[29] They are Argentina, Australia, Brazil, Canada, Hong Kong, India, Mexico, Russia, Singapore, Spain, the UK and the US.

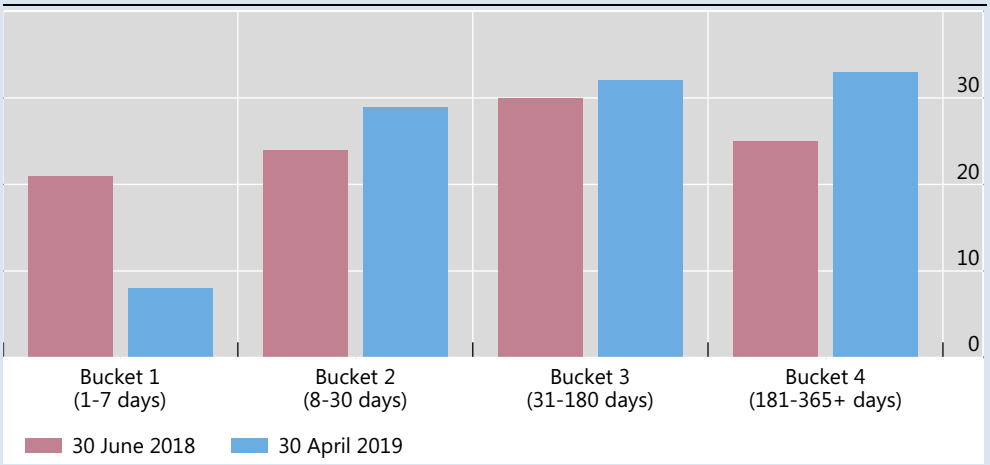
[30] In relation to potential vulnerabilities relating to liquidity transformation in certain open-ended funds, the FSB published *Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities* in January 2017. In response to the FSB recommendations, IOSCO issued *Recommendations for Liquidity Risk Management for Collective Investment Schemes* and associated *Good Practices and Issues for Consideration* in February 2018. At a national level, a number of jurisdictions also have requirements for open-ended funds designed to improve their liquidity risk management practices.

proportion of assets that were considered capable of sale within a specific period in normal market conditions.

Figures provided to the FCA reflect the reduction in the fund's liquidity over a 10-month period.

Liquidity buckets June 2018 vs. April 2019

In percentage of NAV




Source: Financial Conduct Authority.

In March 2019, the FCA became aware that three securities held in the WEIF had been suspended on The International Stock Exchange based in Guernsey. The AFM was not obliged under applicable rules to notify the FCA of these suspensions and did not do so. However, the suspensions were reported in the media.

During May 2019 the net outflows averaged 1% of the fund's net asset value (NAV) per week. However, by early June this had increased significantly and outflows were substantial, with the redemption requests made on 31 May and 3 June amounting to £296 million and representing 8.2% of NAV.

**Fund Suspension and Wind-Up**

On 3 June 2019 LFS announced[31] that it had suspended dealing in the units of the WEIF. The decision to suspend redemptions was taken by LFS in conjunction with NT, which determined that the fund was unable to meet obligations to redeeming investors without risking harm to the interests of all investors. Remaining investors' interests could have been diluted if assets had to be sold at significant discounts to meet redemption requests. Furthermore, if WEIF sold its liquid assets first, the composition of the fund's assets would become more illiquid. LFS deemed neither outcome to be in the best interests of remaining investors.

Suspensions must be reviewed at least every 28 days under FCA rules. Following several reviews of this suspension, LFS announced[32] on 15 October that the WEIF would be wound up and that Woodford Investment Management would be replaced as the fund manager. LFS had set various targets for making progress with the repositioning of the fund. Whilst progress had been made in relation to repositioning the WEIF and disposing of its less liquid

[31] See LFS (2019a).

[32] See LFS (2019b).

assets to improve its liquidity, this had not been sufficient to provide reasonable assurance that the repositioning would be fully achieved and the WEIF could be re-opened in December. Because sufficient progress was not made, LFS decided it was in the best interests of all investors to seek to wind-up the WEIF rather than to reopen the fund.

**Idiosyncratic Event**

The suspension of the WEIF demonstrates that, in exceptional circumstances, an open-ended fund that holds sufficient illiquid assets and has not effectively managed its liquidity risk may not be able to meet significant redemption requests without harming the interests of its investors.

In the UK, suspension of redemptions is a tool that is available to fund managers to protect the interests of all investors.[33] There are good reasons why a manager of a UK authorised fund may decide it is appropriate to use this or other liquidity management tools, for instance, to avoid fire-sales of assets.

The suspension of WEIF had no spillover impacts on the markets. UCITS funds are structured as separate legal entities that are not consolidated on the balance sheets of fund managers therefore a fund manager is not required to support the fund from its own balance sheet. This incident occurred in a benign financial market environment and was addressed without having broader systemic consequences, using an existing liquidity management tool available to the fund manager. That said, Woodford Investment Management resigned as manager of its other UCITS fund, the LF Woodford Income Focus Fund.

### *2.2.2 Insurance corporations and pension funds*[34]

The financial assets of insurance corporations and pension funds remained largely unchanged in 2018 compared to 2017 as was the case with their share of total global financial assets, at 8.7% and 9.4%, respectively. Low growth could be partly attributed to linkages of insurance corporations and pension funds with OFIs, of which assets declined in 2018.[35]

The financial assets of insurance corporations increased marginally by 0.2% in 2018 to $32.9 trillion. Increases in EMEs have offset declines of insurance sector assets in many of the advanced economies in 2018, thus the relative importance of EMEs in the sector continued to increase (Exhibit 2-10, LHS).

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[33] The BoE and the UK FCA are currently undertaking a joint review of open-ended investment funds and looking for ways to improve the alignment of redemption terms and asset liquidity for different types of funds.

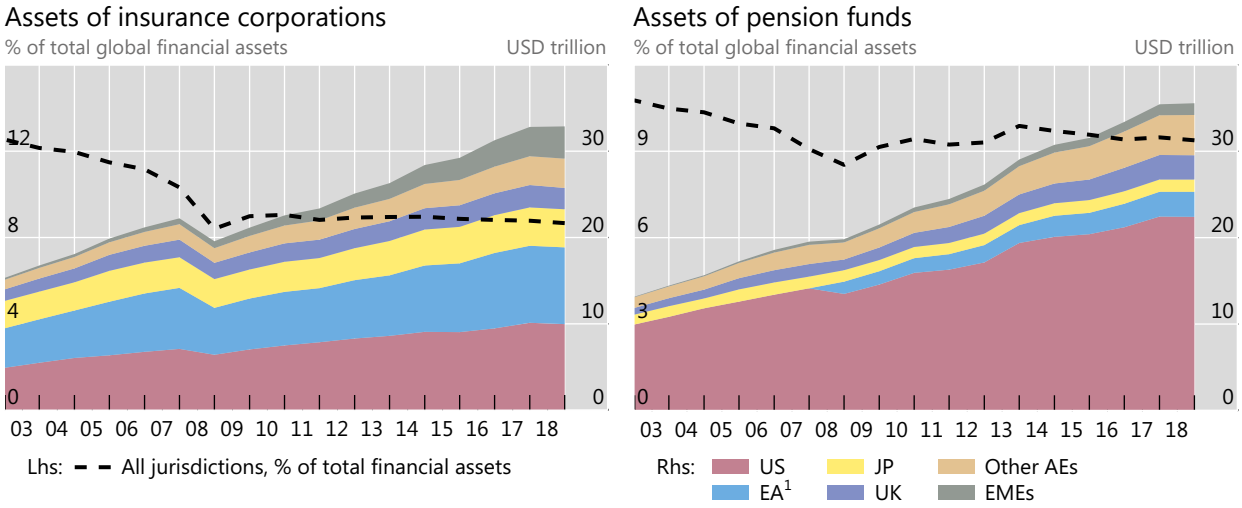
[34] Some insurance corporation and pension fund assets may be included in the narrow measure if they engage in credit intermediation with bank-like risks such as maturity/liquidity transformation. This may occur when such entities purchase credit assets or engage in direct lending activities (where permitted by the relevant regulatory regime). They may also facilitate credit creation by providing credit enhancements or writing puts on credit assets. Through their activities, both insurance corporations and pension funds may also become interconnected with banks and OFIs. For example, an institution writing a put option on a credit asset is agreeing to purchase a credit asset at a specified price, should the other party to the agreement choose to sell.

[35] See Section 3 for more details on interconnectedness among financial intermediaries. According to the OECD (2019), pension fund assets were also impacted by the downturn on equity markets in 2018, with the worst financial performance for pension plans in most OECD jurisdictions since the 2008 financial crisis.

Pension funds grew by 0.4% in 2018 to $35.6 trillion (Exhibit 2-10, RHS), significantly below the sector's annual average growth of 6.3% between 2012 and 2017. The slowdown in growth of financial assets held by pension funds was a common trend in most advanced economies, including the US which represents 63% of global pension fund assets (Exhibit 2-10, RHS). However, pension fund assets grew rapidly in some EMEs, such as China (at 20%) and India (at 34%).

Insurance corporations and pension funds

*21+EA-Group* Exhibit 2-10




[1] EA pension fund data were not provided prior to 2009.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); IMF *World Economic Outlook*; FSB calculations.

## 2.3. Credit intermediation of non-bank financial intermediaries

This section takes a closer look at the involvement of non-bank financial intermediaries in credit intermediation and lending.

### *2.3.1 Credit intermediation and lending*

#### *(i) Credit assets*[36]

Bank credit assets grew at an annual rate of 5.0% to $114.5 trillion in 2018, accounting for 77% of total bank assets (Exhibit 2-11). In 2018, credit intermediation by banks increased in most jurisdictions, except for the Cayman Islands, Italy, the Netherlands and Spain. The strongest growth was in EMEs, for example China (11.8%) and Turkey (19.5%).

[36] The discussion focuses on total credit assets, however the trends hold for credit assets excluding deposits as shown in Exhibit 2-12. Deposits are considered credit assets as they constitute a credit exposure to a bank or other deposit-taking entity.

In 2018, pension fund credit assets also grew strongly, increasing by 7.1% in 2018, a higher growth rate than in 2017 (3.9%). This growth was primarily driven by the US, but credit assets in India (33.3%), Hong Kong (15.5%) and Korea (12.6%) also grew at a high rate.[37]

Credit and lending in the financial system

*21+EA-Group*

Exhibit 2-11

| | Total | Banks | Insurance corporations | Pension funds | OFIs |
|---|---|---|---|---|---|
| **Credit assets (including deposits)** (USD trillion at end-2018) | 185.9 | 114.5 | 17.7 | 8.8 | 44.9 |
| Growth (% in 2018) | 4.9 | 5.0 | 1.5 | 7.1 | 5.7 |
| **Credit assets (excluding deposits)** (USD trillion at end-2018) | 171.2 | 105.0 | 16.8 | 8.2 | 41.2 |
| Growth (% in 2018) | 5.2 | 5.7 | 1.1 | 7.5 | 5.3 |
| **Loan assets** (USD trillion at end-2018) | 96.6 | 80.0 | 2.3 | 0.3 | 14.1 |
| Growth (% in 2018) | 5.4 | 5.9 | 2.4 | 1.6 | 3.0 |

Some exchange rate effects have been netted out by using a constant exchange rate (from 2018).

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

OFI credit assets grew by 5.7% in 2018, compared to 4.1% in 2017 (Exhibit 2-11 and Exhibit 2-12, LHS). Among OFIs, investment funds held the biggest share of credit assets (Exhibit 2-12, middle panel).[38] Credit assets held by hedge funds grew the fastest in 2018 (20.1%), followed by broker-dealers (10.4%), while credit assets for most of the other OFI sub-sectors remained largely unchanged. The growth in the credit assets of broker-dealers and MMFs was relatively broad-based, however the US accounted for most of the overall growth in 2018. In contrast, credit intermediation by trust companies decreased by 7.4%, mostly due to a decline in China.[39] Credit assets represented a larger share of total OFI financial assets in advanced economies (42%) than in EMEs (29%) (Exhibit 2-12, RHS).

In 2018, deposit assets of banks increased by 1.3%, with the largest increases seen in Ireland, Mexico and Turkey.[40] Deposits of insurance corporations also increased (4.1%), whereas those of pension funds remained largely unchanged.

[37] For Hong Kong, the growth is mainly driven by (i) the organic growth in pension fund assets due to regular contributions from employers and employees and (ii) the increase in inflows into bond and money market instruments in 2018. In India, this growth in credit assets is also in line with the growth in pension fund subscribers and assets in 2018.

[38] Fixed income funds (FIFs) is the investment fund category that principally holds credit and/or lending assets (this is the case for 14 out of 19 jurisdictions with available data on FIFs credit assets). Equity funds invest principally in equity securities, and are not involved in credit intermediation. See Annex 3 for more information.

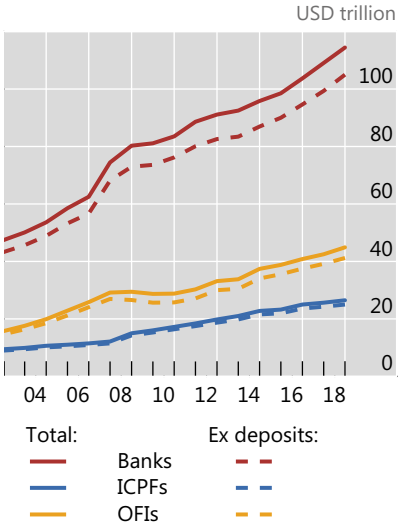
[39] The decline in the assets of Chinese single trusts (which mostly serve as funding vehicles for financial institutions) was driven by a new policy that was issued by the China Banking Regulatory Commission in November 2017 to regulate banks and trusts corporations, requiring that trust companies do not provide financial institutions with a conduit service for the purpose of avoiding regulations such as investment or leverage constraints. The mentioned policy was followed by a series of guidelines for regulating the asset management businesses of financial institutions that were released jointly by the People's Bank of China, China Banking and Insurance Regulatory Commission, China Securities Regulatory Commission, and the State Administration of Foreign Exchange in April 2018. For more details, see Section 4.8 on EF5.

[40] Data on deposits are based on the *29-Group* sample. Bank deposits in some jurisdictions may include deposits at a central bank.

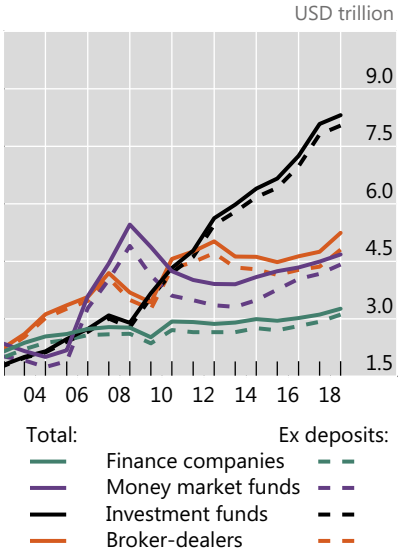
## Credit assets[1]

*21+EA-Group* Exhibit 2-12

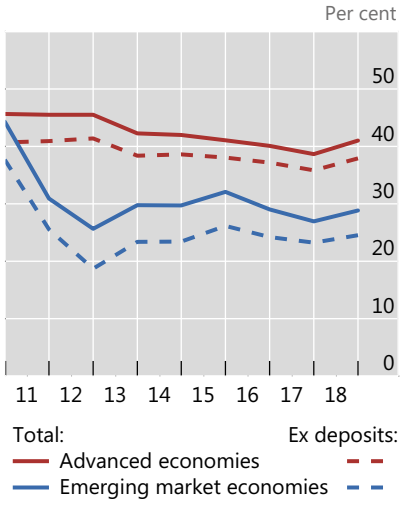
Credit assets held by banks, ICPFs and OFIs




Credit assets held by selected OFI sub-sectors




OFI credit assets as a share of total OFI financial assets




ICPFs = insurance corporations and pension funds; OFIs = other financial intermediaries.

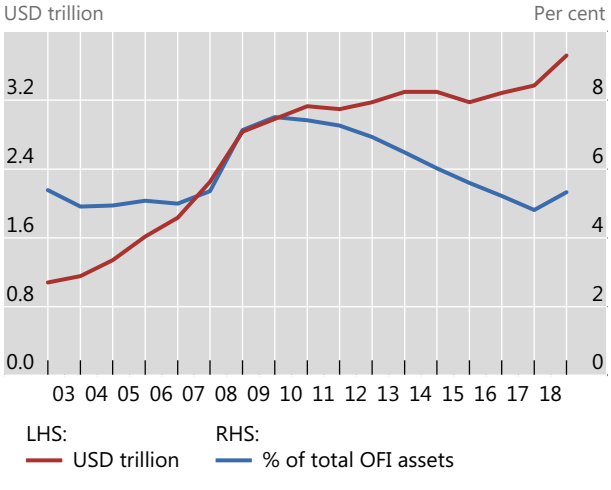
[1] Increases of aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

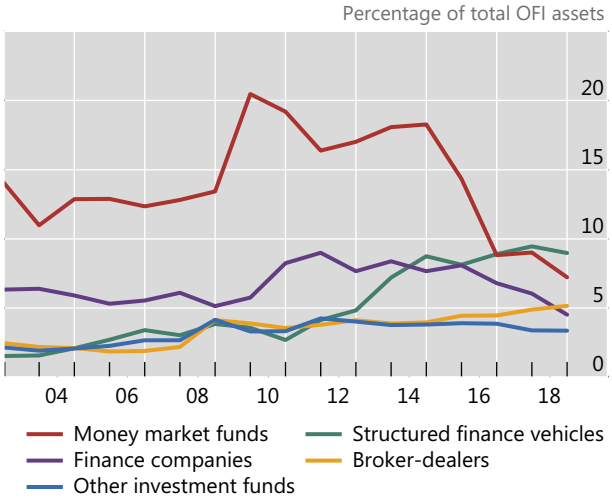
## OFI deposit assets

*29-Group* Exhibit 2-13

OFIs – total




OFIs – selected sub-sectors




Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

OFI deposits at banks increased by 6.0% in 2018, and also showed an increase as a share of OFI total assets for the first time since the global financial crisis (Exhibit 2-13, LHS).[41]

[41] OFI deposits provide an indication of OFI interconnectedness with the banking system, which is discussed further in Section 3.

Deposits for the majority of OFI sub-sectors decreased (Exhibit 2-13, RHS), but increased for broker-dealers. Japan and the UK accounted for two-thirds of the overall growth in these deposits. Moreover, deposits of broker-dealers have grown relative to their total assets since the financial crisis, in contrast to overall OFI deposits.

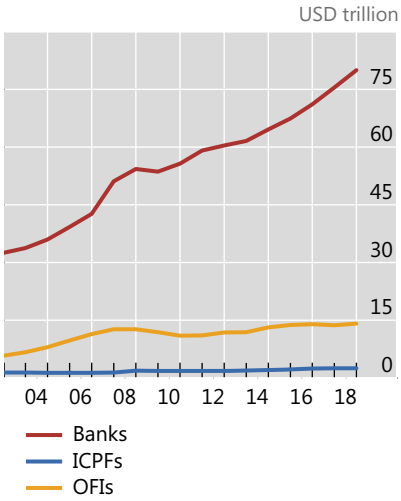
### *(ii) Lending*[42]

Lending by banks grew by 5.9% to $80.0 trillion in 2018 (Exhibit 2-14). About 37% of the total increase in bank loans was driven by China, with the euro area and the US also contributing significantly. Bank lending increased in all jurisdictions in 2018, except the Cayman Islands, Italy, the Netherlands and Spain.

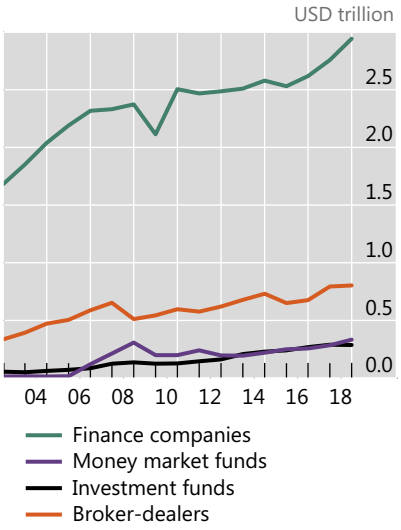
Lending[1]

*21+EA-Group* Exhibit 2-14

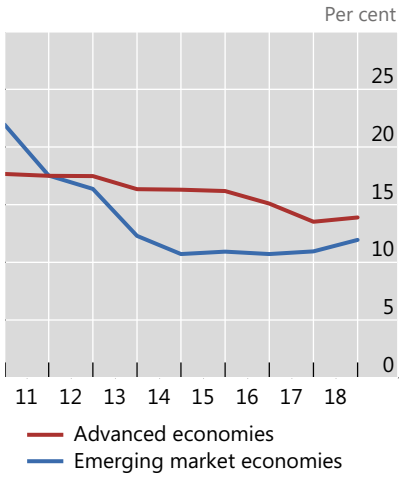
Lending by banks, ICPFs and OFIs




Lending assets of selected OFI sub-sectors




OFI lending assets as a share of total OFI financial assets[2]




ICPFs = insurance corporations and pension funds; OFIs = other financial intermediaries.

[1] Increases of aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level. [2] Advanced economies = AU, BE, CA, DE, ES, FR, HK, IE, IT, JP, KR, KY, LU, NL, SG, UK and the US. Emerging market economies = AR, BR, CL, CN, ID, IN, MX, RU, TR, SA and ZA.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Banks continued to be the single largest source of lending, accounting for 83% of global loan assets at end-2018. OFI lending assets grew by 3.0% in 2018, to $14.1 trillion. The growth in OFI lending assets occurred largely in the euro area. As a share of total OFI financial assets, lending assets increased in most of the jurisdictions.

Among the OFI sub-sectors, finance companies saw the largest nominal increase in lending assets (Exhibit 2-14, middle panel), reaching almost $3 trillion in 2018, mostly due to

[42] Loan assets are a subset of credit assets, described in the previous section. The category of loans includes overdrafts, instalment loans, hire-purchase credit and loans to finance trade credit. National accounts data are used, the corresponding SNA 2008 code for transactions in financial assets and liabilities is AF4.

increases in China and India.[43] However, loans held by MMFs exhibited the largest growth rate (16.7%), driven almost exclusively by the euro area.

### *(iii) Wholesale funding and repos*

Wholesale funding instruments, which include repos, are important funding sources for both banks and non-bank financial entities. While wholesale funding instruments support price discovery and secondary market liquidity for a wide variety of securities, they can also be used by non-bank financial entities to create short-term money-like liabilities, facilitating credit growth, and maturity/liquidity transformation outside the banking system. This may pose financial stability risks by contributing to the build-up of leverage and maturity mismatches. Wholesale funding may also increase interconnectedness among financial institutions and contribute to pro-cyclicality.

OFIs have become less reliant on wholesale funding since 2011, due to a reduction in the use of repos as a source of funding. Long-term wholesale funding is still the dominant source of wholesale funding for OFIs in aggregate at 16.4% of OFI assets, while short-term wholesale funding[44] (excluding repos) comprises 5.2% (Exhibit 2-15, LHS). OFIs' reliance on long-term wholesale funding varied substantially across jurisdictions, with OFIs in some jurisdictions using almost no long-term wholesale funding (Brazil, Mexico and the US) while others rely on long-term wholesale funding for more than 80% of their total funding (eg Australia, Canada, China, Ireland, Singapore and Spain). This reliance was typically due to either finance companies or SFVs.

OFIs continue to be net providers of cash to the financial system through reverse repos, while banks remain net recipients of cash through repos as reflected by their net repo positions (Exhibit 2-15, middle panel). OFIs' net repo position, however, was little changed in 2018. Amongst OFIs, MMFs, trust companies, investment funds and SFVs are net providers of cash through repos, whereas broker-dealers, hedge funds and finance companies are net recipients. Banks' repo assets saw a sharp increase in 2018, exceeding the growth in banks' repo liabilities, mostly due to the UK and the US. Banks acted as net providers of cash through repos in some jurisdictions, the largest of which being the UK, Canada and the US, and net recipients in others, the largest of which being France and Japan (Exhibit 2-15, RHS).

The use of repos by banks has increased over the past few years, mostly in advanced economies. Total repo assets of banks grew by 21.2% in 2018 to reach $5.9 trillion, while their total repo liabilities grew by 15.0% to reach $6.0 trillion (Exhibit 2-16), with most growth in advanced economies. Similarly, OFIs' repo liabilities have grown significantly since 2016, growing at 6.4% to $3.9 trillion in 2018, driven by the increasing use of repo as a source of funding by OFIs in the Americas (Exhibit 2-16, RHS).

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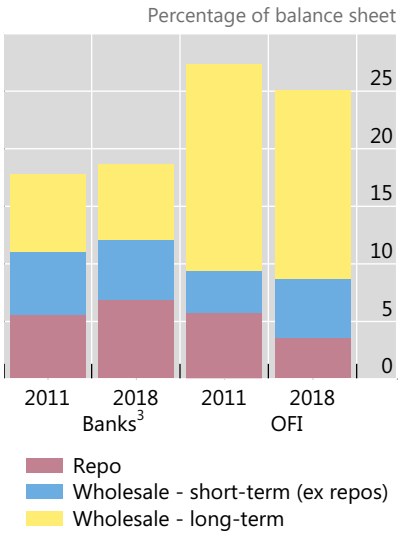
[43] Hong Kong also contributed to this growth. However, the change in finance companies' lending assets in Hong Kong in 2018 over 2017 was mainly due to changes in data samples, making the figures for 2018 not directly comparable to those for 2017.

[44] Short-term funding is all wholesale funding with a residual maturity of less than 12 months.

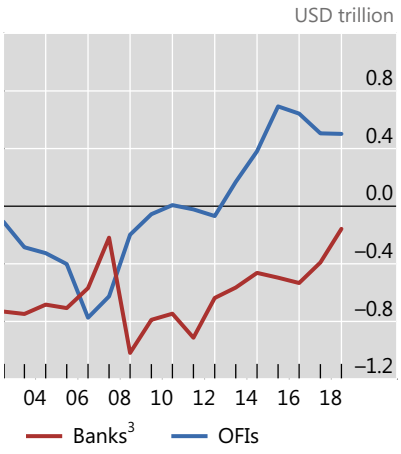
## Wholesale funding

*29-Group* Exhibit 2-15

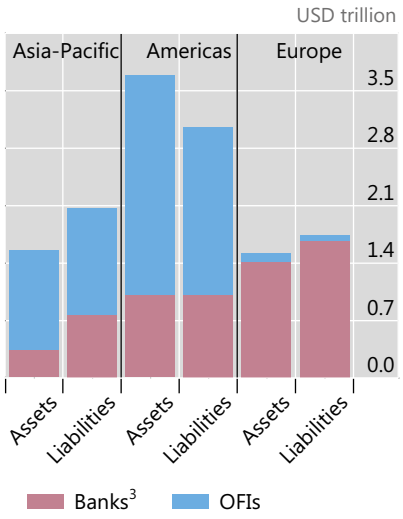
Funding of entities, by source[1]




Net repo position (Repo assets - repo liabilities)[2]




Repo assets and liabilities across geographic areas[4]



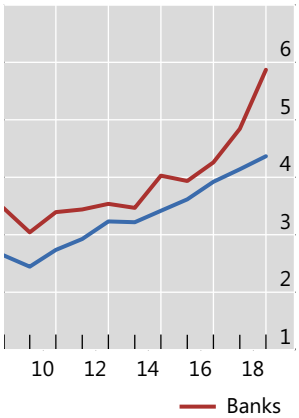

[1] Bank funding data from AU, BR, CA, CH, ES, FR, KR, KY, LU, MX, NL, UK, US and ZA. OFIs funding data from AU, BR, CN, ES, FR, IN, IT, KR, LU, MX, NL, SG and the US. Short-term funding is defined as wholesale funding whose residual maturity is less than 12 months. [2] Data for banks' net repo positions from AR, BR, CA, FR, ID, IN, JP, MX, SA, UK and the US. Data for OFIs' net repo positions from AU, BR, ES, FR, JP, IN, MX, SG and the US. Assets related to repo transactions on the buyer's (collateral-taker, cash-provider) balance sheet. Liabilities related to repo transactions on the seller's (collateral-provider, cash-taker) balance sheet. [3] All deposit-taking corporations. [4] Americas = BR, MX and the US; Asia-Pacific = AU, CN, IN, JP, KR and SG; Europe = ES, FR, IT, NL and RU.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

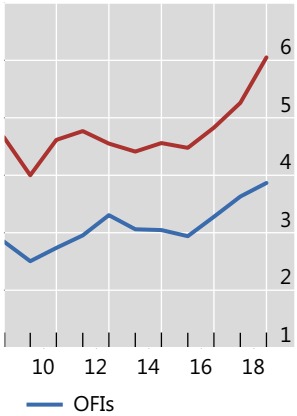
## Repo assets and liabilities

*29-Group*, in USD trillion Exhibit 2-16

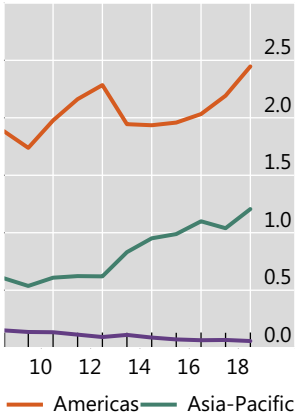
Total repo assets of banks and OFIs



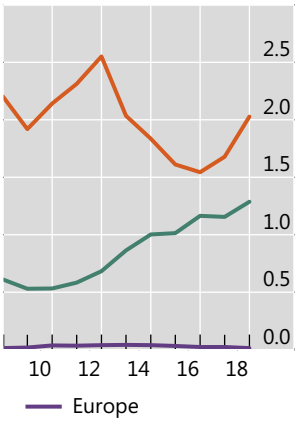

Total repo liabilities of banks and OFIs




Total OFI repo assets across geographic areas




Total OFI repo liabilities across geographic areas




Europe = ES, FR, IT, NL and RU; Americas = BR, MX and the US; Asia-Pacific = AU, CN, IN, JP, KR and SG.

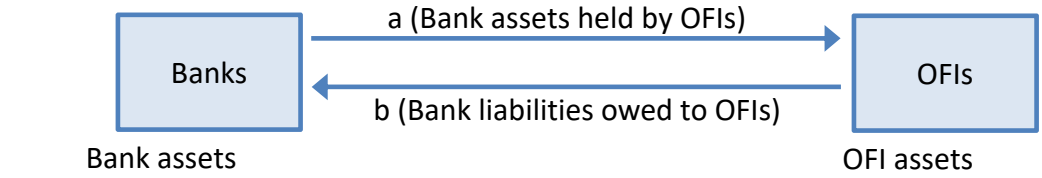
Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

# 3. Direct interconnectedness among financial sectors

Financial interconnectedness is a feature of an open and integrated global financial system. It can help diversify risk across financial sectors, but can also propagate certain risks during periods of stress.[45] Interconnectedness has implications for financial stability through funding and credit risk channels, particularly where these channels are associated with the build-up of leverage or maturity/liquidity mismatches. Therefore, linkages among banks, OFIs and other non-bank financial entities can serve as important indicators of potential contagion, within and across borders.

A framework to analyse direct interconnectedness between banks and OFIs

Exhibit 3-1




**High-level interconnectedness measures:**

| Banks' exposures to OFIs = $\frac{a}{\text{Bank assets}}$ | Banks' use of OFI funding = $\frac{b}{\text{Bank assets}}$ | OFIs' use of bank funding = $\frac{a}{\text{OFI assets}}$ | OFIs' exposures to banks = $\frac{b}{\text{OFI assets}}$ |
|---|---|---|---|

This section focuses on direct domestic interconnectedness between OFIs and banks, insurance corporations and pension funds, as well as OFI cross-border linkages.[46] To measure direct interconnectedness, the FSB compiles aggregated balance sheet data to derive bilateral exposures between financial sectors (eg assets and liabilities of banks to OFIs and of OFIs to banks).[47] These aggregated data are used to calculate high-level measures of interconnectedness (including exposures and funding dependence) between sectors, as illustrated in Exhibit 3-1. Exposures refer to the balance sheet asset exposures that arise from credit provision and/or investment to/in a counterparty, while funding dependence refers to the dependence that arises from sourcing funding from a counterparty. Interconnectedness between banks and OFIs through credit and funding relationships has remained largely unchanged since 2016, after declining from its 2009

[45] For example, if one or more large OFIs (particularly those with a high degree of leverage or significant maturity/liquidity transformation) are significant borrowers from one or more banks, material credit deterioration of those OFIs could precipitate broader contagion to a large bank or across multiple banks, which may spread to the entire banking system or other financial intermediaries.

[46] Direct borrowing/lending and investment exposures between two counterparties are examples of direct interconnectedness.

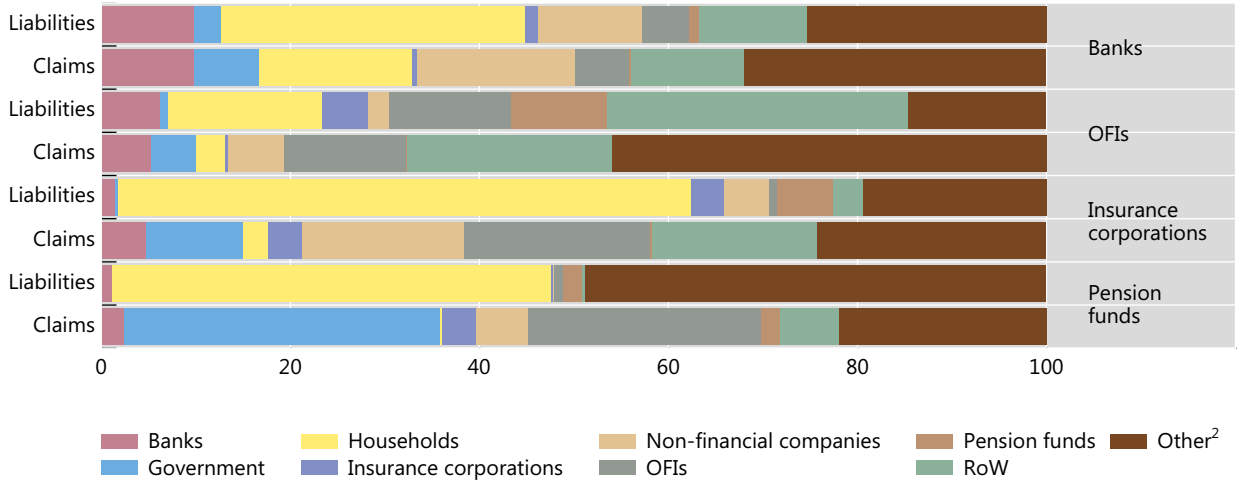
[47] The FSB makes adjustments for assets and liabilities of OFIs that are prudentially consolidated into banking groups whenever jurisdictions provided the required granularity in their data submissions (in these cases data net of prudential consolidation are used). Most jurisdictions have followed their respective accounting rules and brought the full amount of an entity's assets back onto the bank's balance sheet, even in the case of partial ownership.

levels. Investment funds and MMFs remain the largest OFI sub-sectors that provide credit to banks.

## 3.1. Overall interconnectedness among financial sectors

For the 2019 monitoring exercise, jurisdictions submitted improved interconnectedness data (ie more entities over longer historical periods).[48] However, results may not be comparable across jurisdictions because some authorities only reported a subset of exposures, thus suggesting further consideration of potential improvements in gathering interconnectedness data. For example, due to limitations in data availability, some jurisdictions only reported a subset of bank assets/liabilities (eg loans/deposits) to (some) OFI sub-sectors, instead of total bank assets/liabilities to all OFIs.[49]

Aggregate linkages, measured as a percentage of financial assets[1] Exhibit 3-2




[1] Data were aggregated across jurisdictions where both linkage and asset data are available. The computed measures do not capture risks from indirect interconnectedness and do not take into account important qualitative aspects, such as the difference between secured and unsecured liabilities. [2] "Other" indicates additional unknown linkages, which comprise linkages to other sectors not covered in this Report.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Based on the available data, the linkages among banks, OFIs, insurance corporations and pension funds are shown in Exhibit 3-2, together with domestic linkages to households, non-financial corporates, government and cross-border exposures. The relative importance of these linkages varies across sectors, according to different business models. For example, the largest liabilities of banks, insurance corporations and pension funds are to households, whereas the largest liabilities of OFIs are to the rest of the world (RoW).

[48] Despite improvements, the direct interconnectedness measures currently do not capture derivatives and contingent exposures (eg bank lines of credit to OFIs). The FSB will continue to improve the measures and the analysis going forward. Limited data, especially on cross-border interconnectedness, also pose significant challenges to a comprehensive assessment of the interconnectedness between banks and OFIs across borders.

[49] In 2019, a survey was conducted among participating jurisdictions to determine the types of exposures reported as part of the interconnectedness data. The survey indicated that further efforts from authorities in filling data gaps are necessary, especially for linkages among banks, pension funds and insurance companies.

Other important sources of OFI funding are domestic funding from households, other OFIs and pension funds.

Similar to liabilities, in aggregate terms, OFIs' cross-border claims are the largest, followed by exposures to other domestic OFIs. OFIs have limited claims on pension funds, insurance corporations and households.

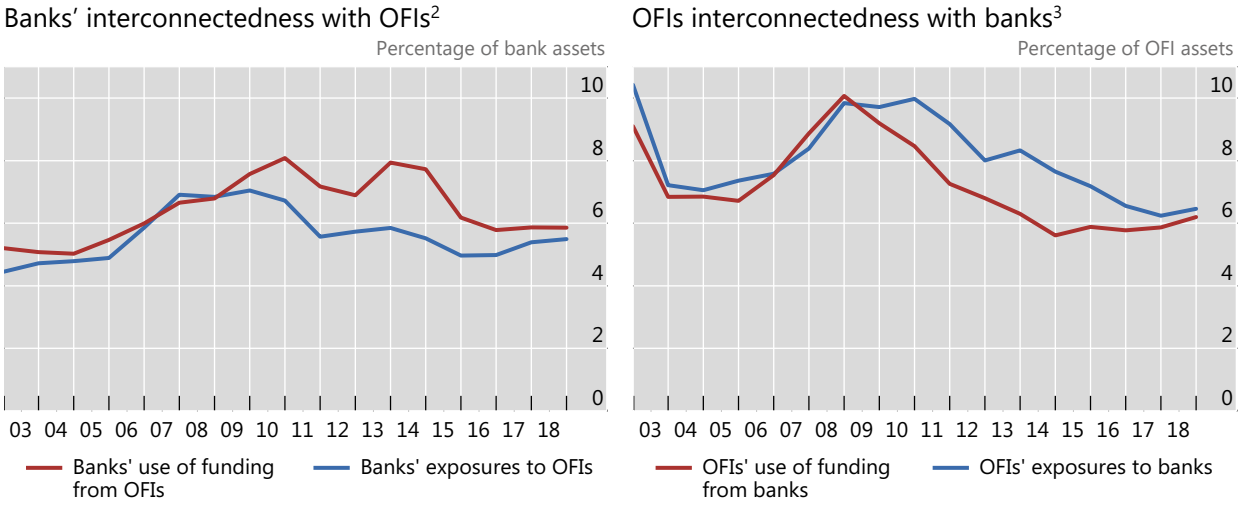
While in aggregate terms OFIs' liabilities to and claims on the RoW are larger than OFIs' liabilities to and claims on banks, OFI linkages with banks at a jurisdictional level remain important, with 12 of 19 reporting jurisdictions reporting larger linkages between OFIs and banks than between OFIs and the RoW.

## 3.2. General trends in interconnectedness between banks and OFIs

Banks and OFIs are directly connected, with funding channels operating in both directions. For example, banks often extend credit to (or invest in) OFIs, while OFIs provide funding to banks, or custodian banks receive the non-invested part of fund assets/operational deposits. In this section, these exposures are first analysed on an aggregated basis over time, and then per jurisdiction as at end-2018.

Interconnectedness between banks and OFIs

*21+EA Group*[1] Exhibit 3-3




[1] Changes in interconnectedness measures may also reflect improvements in the availability of data over time at a jurisdictional level. [2] Banks' use of funding from OFIs = Banks' liabilities to OFIs as a share of bank assets. Banks' exposure to OFIs = Banks' claims on OFIs as a share of bank assets. [3] OFIs use of funding from banks = OFIs' liabilities to banks as a share of OFI assets. OFIs exposures to banks = OFIs' claims on banks as a share of OFI assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

After gradually trending downward since 2010, linkages between OFIs and banks remained relatively unchanged in 2018 and are at levels similar to those observed prior to the global financial crisis – despite the decline in OFI assets in 2018. Funding and credit interconnectedness between banks and OFIs, measured as a percentage of OFI assets,

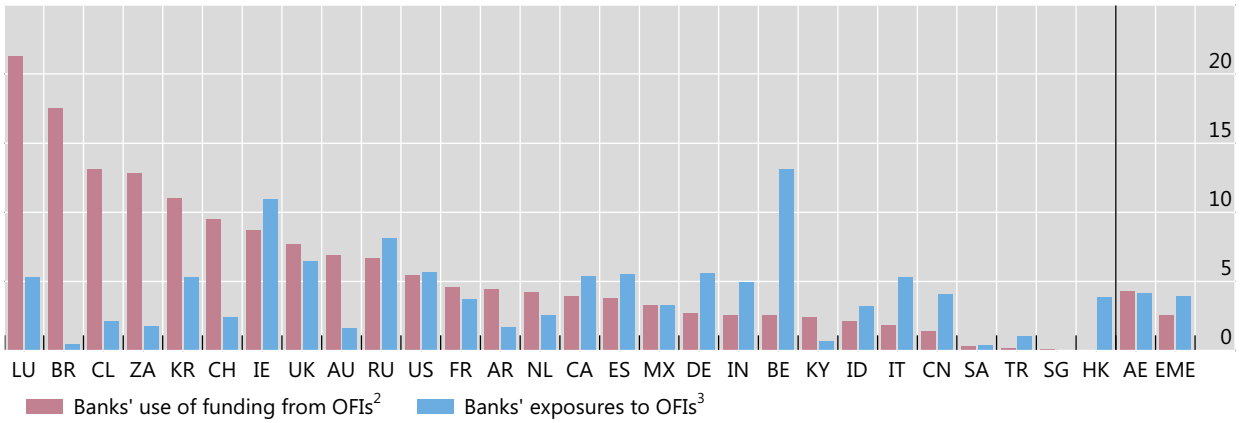
increased marginally in 2018 – largely as a result of the decline in OFI assets (Exhibit 3-3).[50] In aggregate, OFIs' use of funding from banks and exposures to banks are of similar magnitude, amounting to 6.2% and 6.4% of OFI assets, respectively, at end-2018 (compared to 5.9% and 6.3% at end-2017).

### *3.2.1 Banks' interconnectedness with OFIs*

Banks' linkages with OFIs varied significantly across jurisdictions, with banks' use of funding from OFIs being nearly equal to banks' exposure to OFIs in some jurisdictions but quite different in others (Exhibit 3-4). Although banks' use of funding from OFIs and banks' exposure to OFIs have generally decreased in recent years, in 2018 there was an uptick in just over half of the jurisdictions.

Banks' interconnectedness with OFIs[1]

End-2018, as a percentage of bank assets — Exhibit 3-4




[1] Based on *29-Group* to benefit from more disaggregated data. Some jurisdiction's exposure and funding links between banks and OFIs reflect the provision of data gross of prudential consolidation whereas other jurisdictions provided data net of prudential consolidation (ie a substantial part of this exposure reflects bank activity with related OFIs within a banking group). [2] Banks' liabilities to OFIs as a share of bank assets. [3] Banks' claims on OFIs as a share of bank assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Banks' use of funding from OFIs was below 10% of total bank assets in 24 jurisdictions (Exhibit 3-4, red bars), and above 15% in Brazil and Luxembourg. These liabilities to OFIs can be disaggregated into specific OFI entity types (ie MMFs, other investment funds, finance companies, broker-dealers and SFVs). Based on available data, the primary source of bank funding from OFIs was funding from other investment funds, as in the case of Australia, Brazil,[51] Ireland, Luxembourg,[52] Mexico and South Africa (Exhibit 3-5) while bank funding obtained from MMFs was the primary source in Argentina, Chile and France.

[50] The sample of jurisdictions reporting data on the interconnectedness between banks and OFIs increased in the 2019 monitoring exercise. The results presented here are based on historical data included in jurisdictions' 2019 submissions and are therefore not directly comparable to the results from the 2018 monitoring exercise.

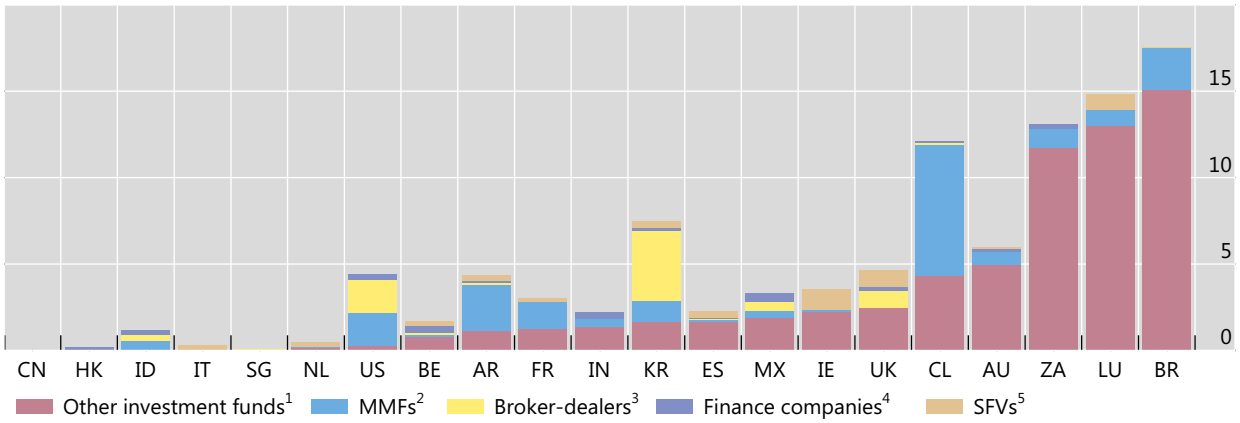
[51] For a discussion of bank funding from investment funds in Brazil, see Box 3-3 in FSB (2018a).

[52] In Luxembourg, this is primarily due to investment funds' operational deposits at their custodian banks. These operational deposits are the non-invested part of the fund's assets and are necessary for the fund to remain operational. As custodian banks are not credit-driven, this cash is typically placed on a short-term basis at the central bank or other banks, leading to very low credit-to-deposit ratios.

Banks' exposures to selected OFIs entity types were below 5% of bank assets in 17 out of the 28 jurisdictions that reported these data points, but made up over 10% of bank assets in Belgium and Ireland (Exhibit 3-4, blue bars). Examining selected OFI sub-sectors (Exhibit 3-6), banks' exposures remained below 2% of total bank assets for MMFs, other investment funds and broker-dealers for the majority of jurisdictions. However, exposures to finance companies and SFVs were much larger in a few jurisdictions.[53]

## Banks' use of funding from selected OFI entity types

End-2018, as a percentage of bank assets — Exhibit 3-5

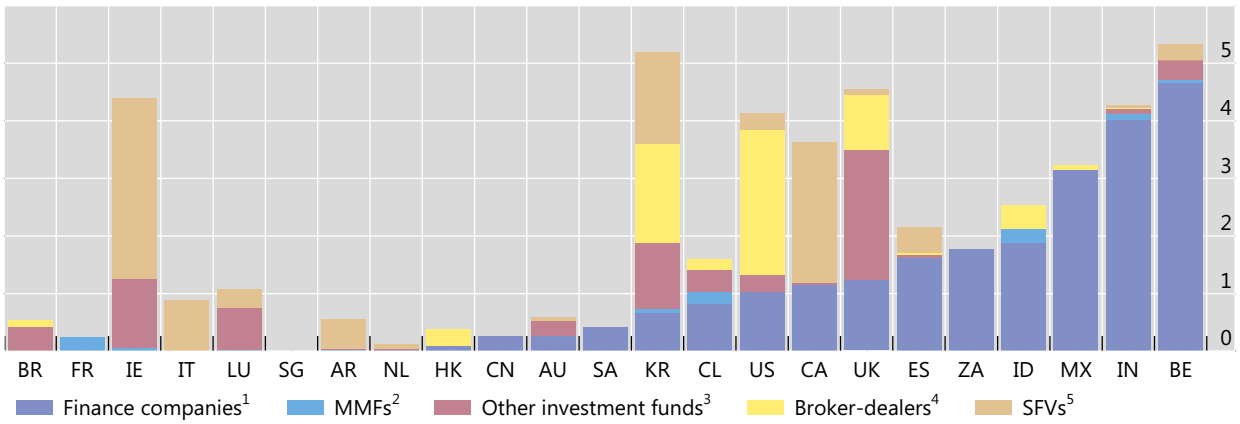



[1] Banks' liabilities to other investment funds (equity, fixed income and mixed funds) as a share of bank assets. [2] Banks' liabilities to MMFs as a share of bank assets. [3] Banks' liabilities to broker-dealers, net of prudential consolidation when available, as a share of bank assets. [4] Banks' liabilities to finance companies, net of prudential consolidation when available, as a share of bank assets. [5] Banks' liabilities to SFVs, net of prudential consolidation when available, as a share of bank assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## Banks' exposures to selected OFI entity types

End-2018, as a percentage of bank assets — Exhibit 3-6




[1] Banks' exposure to finance companies, net of prudential consolidation when available, as a share of bank assets. [2] Banks' exposure to MMFs as a share of bank assets. [3] Banks' exposure to other investment funds (equity, fixed income and mixed funds) as a share of bank assets. [4] Banks' exposure to broker-dealers, net of prudential consolidation when available, as a share of bank assets. [5] Banks' exposure to SFVs, net of prudential consolidation when available, as a share of bank assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

[53] In cases where data net of prudential consolidation are not available this could include intragroup connections.

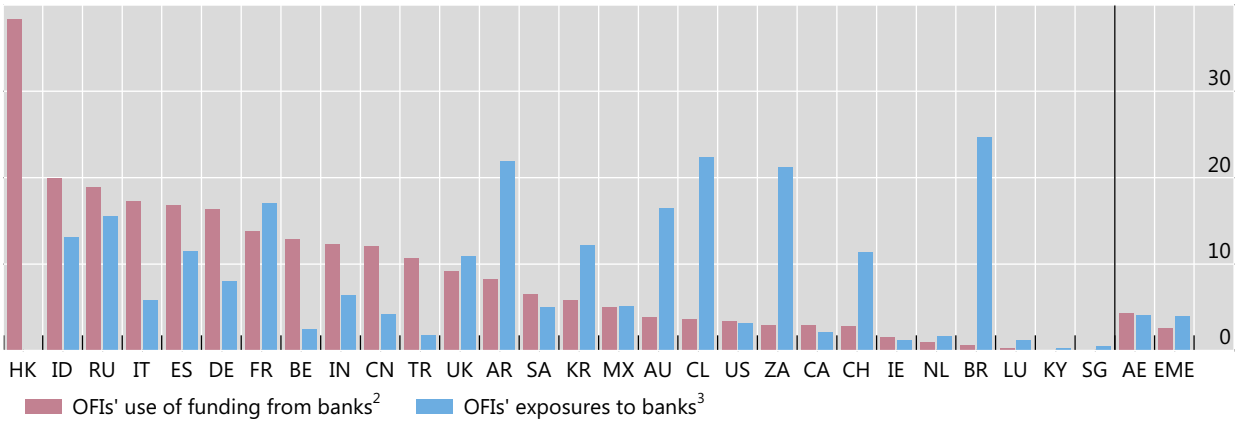
### 3.2.2 *OFIs' interconnectedness with banks*

Although OFIs' interconnectedness with banks (Exhibit 3-3, RHS panel) is effectively the mirror image of banks' interconnectedness with OFIs (Exhibit 3-3, LHS panel),[54] in some jurisdictions these linkages tend to be more important for OFIs than for banks (eg those with a relatively large banking sector).

OFIs' use of funding from banks remains significant in a number of jurisdictions, at over 10% of total OFI financial assets in 11 jurisdictions and over 15% of total OFI financial assets in Germany, Hong Kong, Indonesia, Italy, Russia and Spain. However, OFIs' exposures to banks were larger than OFIs' use of funding from banks in several EMEs and make up over 20% of total OFI assets in Argentina, Brazil, Chile and South Africa (Exhibit 3-7).

OFIs' interconnectedness with banks[1]

End-2018, as a percentage of OFI assets — Exhibit 3-7




[1] Based on *29-Group* to benefit from more disaggregated data. OFIs' liabilities to banks as a share of OFI assets. Some jurisdictions' exposure and funding links between banks and OFIs reflect the provision of data gross of prudential consolidation whereas other jurisdictions provided data net of prudential consolidation (ie a substantial part of this exposure reflects bank activity with related OFIs within a banking conglomerate). Jurisdictions that provided data on OFI use of funding from banks, net of prudential consolidation where data availability permits, are AU, CA, CL, ES, ID, IT, LU, MX, NL, SA, SG and UK. Jurisdictions that provided data on OFI exposures to banks, net of prudential consolidation where data availability permits, are AU, CL, ES ID, IT, KY, LU, MX, NL, SG and UK. [2] OFIs' liabilities to banks as a share of OFI assets. [3] OFIs' claims on banks as a share of OFI assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## 3.3. Interconnectedness of insurance corporations and pension funds to OFIs

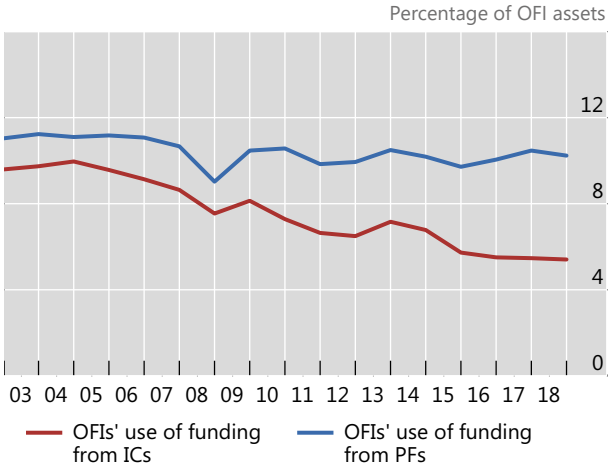
Insurance corporations and pension funds typically do not obtain significant funding from OFIs, though they tend to lend to or invest in OFIs. OFIs' use of funding from pension funds continued to exceed their use of funding from insurance corporations, which has been declining over the past several years (Exhibit 3-8, LHS). Rather than direct lending, insurance corporations and pension funds invest in OFIs. Withdrawals of these investments by insurance corporations or pension funds from certain OFIs could lead to funding pressure on these OFIs and, in turn, the funding that these OFIs provide to other sectors.

[54] This section uses the same data as in Section 3.2, but divides by OFI assets rather than bank assets (see Exhibit 3-1).

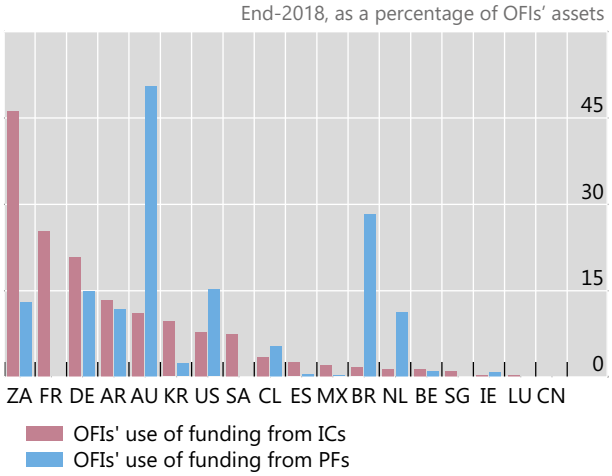
Interconnectedness between OFIs, insurance corporations and pension funds[1]

*29-Group* Exhibit 3-8

OFIs' use of funding[2]




Insurance corporations and pension funds: Interconnectedness with OFIs



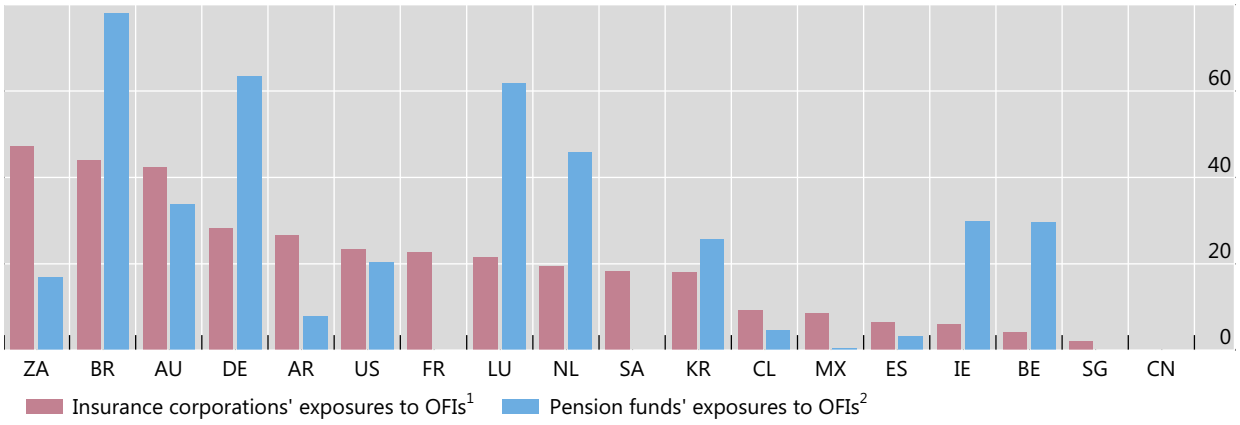

[1] Changes in interconnectedness measures may also reflect improvements in the availability of data over time at a jurisdictional level. [2] OFIs use of funding from ICs = OFIs' liabilities to insurance corporations as a share of OFI assets. OFIs use of funding from PFs = OFIs' liabilities to pension funds as a share of OFI assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Insurance corporations' and pension funds' exposure to OFIs differ among jurisdictions. For example, pension funds' exposures to OFIs as a percentage of OFI assets are relatively large in Australia and Brazil, while insurers' exposures to OFIs were relatively large in France, Germany and South Africa (Exhibit 3-8, RHS).

Insurance corporations and pension funds: Interconnectedness with OFIs

End-2018, as a percentage of insurance corporations' and pension funds' assets Exhibit 3-9




[1] Insurance corporations' claims on OFIs as a share of insurance corporations assets. [2] Pension funds' claims on OFIs as a share of pension fund assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

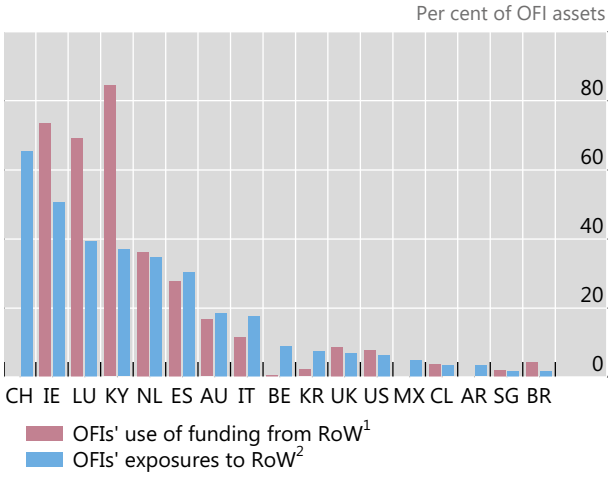
For pension funds, exposures to OFIs exceed 40% of pension fund assets in Brazil, Germany, Luxembourg and the Netherlands (Exhibit 3-9). Insurance corporations, in contrast, have relatively smaller exposures to OFIs as a percentage of insurance corporations' assets, with all but three jurisdictions' linkages below 30% of insurers' assets.

## 3.4. Cross-border interconnectedness (exposures to the rest of the world)

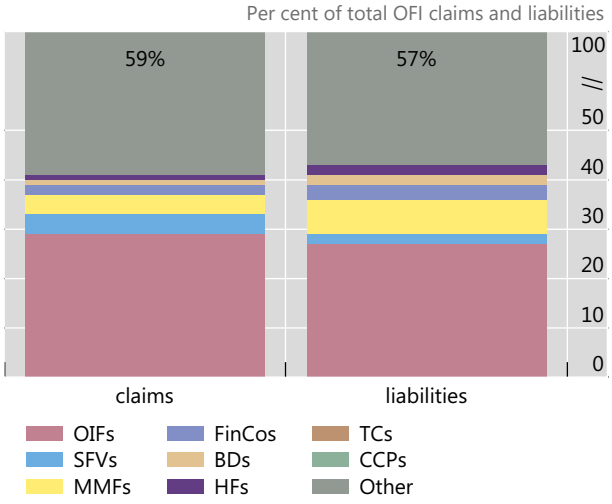
Cross-border interconnectedness data (exposures and funding) were collected from the financial sectors of each jurisdiction (eg banks, OFIs, insurance corporations and pension funds).

Cross-border interconnectedness — Exhibit 3-10

Aggregate exposures between OFIs and the rest of the world (RoW)




OFIs' cross-border interconnectedness, at end-2018




[1] OFIs' liabilities to the RoW as a share of OFI assets. [2] OFIs' claims on the RoW as a share of OFI assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

OFI sectors in the Cayman Islands, Ireland, Luxembourg and the Netherlands – jurisdictions that serve as hubs for international capital flows – have relatively high levels of cross-border interconnectedness, with cross-border investment in OFIs (ie OFIs use of cross-border funding) exceeding cross-border exposure of OFIs (Exhibit 3-10, LHS). A significant part of these linkages can be attributed to 'other investment funds', ie investment funds other than MMFs and hedge funds (OIFs, 29% of assets and 27% of liabilities) (Exhibit 3-10, RHS), which includes funds in one jurisdiction investing in funds in another jurisdiction. However, across all reporting jurisdictions, over half of the interconnections between the OFI sector and RoW (59% of assets and 57% of liabilities) cannot be attributed to a specific OFI sub-sector based on the data collected by the exercise.

# 4. The narrow measure of NBFI

This section first describes the FSB's process for obtaining the narrow measure according to the five EFs (or activities).[55] It then provides an overview of global and regional trends for the overall narrow measure across all EFs.[56] Finally, the trends and risk metrics are presented for each of the five EFs (see Box 4-1 for discussion of the metrics used to describe these risks).[57] The key takeaways are:

**The narrow measure of NBFI grew by 1.7%, to $50.9 trillion in 2018**, significantly slower than the 2012-17 average annual growth rate of 8.5%. It now represents 13.6% of total global financial assets.

- **EF1 grew by 0.4% in 2018**, representing 72.0% of the narrow measure. This growth rate was much slower than the 11.0% average annual growth rate from 2012 to 2017. Two of the largest EF1 entity types, MMFs and fixed income funds, invest primarily in credit assets (reflecting their business models) and engage in liquidity and maturity transformation.
- **EF2 grew by 6.9% in 2018**, representing 7.0% of the narrow measure. Finance companies, the entity type most commonly classified into EF2, displayed a somewhat elevated degree of leverage, but have moderate maturity transformation in most jurisdictions.
- **EF3 grew by 8.7% in 2018,** representing 8.8% of the narrow measure. Broker-dealers that are not prudentially consolidated into banking groups constitute the largest EF3 entity type; they employ significant leverage (reflecting their business models), particularly when accounting for off-balance sheet exposures. The leverage of these broker-dealers increased modestly in 2018 in most jurisdictions, but in aggregate remains lower than the levels seen in the lead up to the financial crisis.
- **EF4 grew by 5.0% in 2018**, representing less than 1% of the narrow measure. As in previous years, the current size of these entities may be significantly understated due to the difficulty in capturing off-balance sheet exposures. Risk data were also sparse and difficult to interpret. Assets of investment funds involved in credit derivatives have increased in recent years, and accounted for the biggest share of EF4 assets in 2018.
- **EF5 remained unchanged in terms of nominal asset value in 2018**, representing 9.3% of the narrow measure. Assets of SFVs, which includes CLOs, grew by 9.7%, continuing the growth seen in 2017. However, this growth was offset by a decrease in assets of Chinese trust companies, which fell by 21.7%.

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[55] The narrow measure also includes an unallocated category, which captures OFIs that the relevant authorities assessed to be involved in bank-like financial stability risks from NBFI, but which could not be assigned to a specific EF.

[56] As in previous Reports, the 29-Group sample is used for the narrowing down section of this Report because of its greater granularity. Therefore, all the aggregates discussed in this Section relate to the *29-Group* sample and might deviate from the aggregates discussed in the macro-mapping section (which relies on *21+EA-Goup*).

[57] The Experts Group periodically assesses the effectiveness of these metrics as measures of the underlying risks.

## 4.1. Narrowing down towards an activity-based measure of NBFI

The FSB's monitoring methodology involves two steps. The first step casts the net wide to capture an aggregate measure of the financial assets of entities that engage in NBFI, the "Monitoring Universe of Non-bank Financial Intermediation" (MUNFI). MUNFI includes insurance corporations, pension funds, OFIs and financial auxiliaries. The second step narrows the focus to non-bank financial entities that are involved in credit intermediation and that have increased potential for posing risks to financial stability (through liquidity/maturity transformation and/or leverage), resulting in the FSB's "narrow measure" of NBFI. [58] This step is undertaken by classifying a subset of the MUNFI entities into the five EFs.[59]

To implement this EF (or activity)-based approach to monitoring NBFI, authorities assess non-bank financial entities' business models, activities and associated bank-like risks that may be posed to financial stability, and classify the relevant entity types into one or more of the five EFs. Authorities exclude entities that are either: (i) not typically part of a credit intermediation chain; or (ii) part of a credit intermediation chain, but are not involved in significant maturity/liquidity transformation and/or leverage. This approach incorporates authorities' supervisory judgement (or qualitative information) given that data are sometimes not available. The inclusion of non-bank financial entities or activities in the narrow measure is based on a conservative assessment of potential risks to financial stability (including on a pre-mitigant basis) and does not constitute a judgement that policy measures applied to address the financial stability risks from NBFI of these entities and activities are inadequate or ineffective.[60] Each EF contains a number of different entity types, and the financial stability risks posed by different entity types, and within an entity type, may differ (Exhibit 4-1). For example, within EF1 (management of CIVs with features that make them susceptible to runs), the degree of run risk may vary between different types of MMFs, in particular, following recent regulatory reforms across several jurisdictions.

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58 This second step is based on the August 2013 FSB Policy Framework.

59 Some entity types may be classified into more than one EF. In those few cases, its value is proportionately allocated between the EFs into which it was classified so as to only count once towards the jurisdiction's narrow measure.

60 This conservative assessment (ie inclusive) helps enhance consistency across jurisdictions. The Experts Group regularly reviews the composition of the narrow measure in light of better data and analysis. For example, the narrow measure currently includes certain types of MMFs, such as US Treasury MMFs with specific structural features that may warrant more thorough discussion in the EF-based approach.

Classification by Economic Functions (EFs) Exhibit 4-1

| EF | Definition | Typical entity types[61] |
|---|---|---|
| **EF1** | Management of collective investment vehicles with features that make them susceptible to runs | MMFs, fixed income funds, mixed funds, credit hedge funds,[62] real estate funds |
| **EF2** | Loan provision that is dependent on short-term funding | Finance companies, leasing/factoring companies, consumer credit companies |
| **EF3** | Intermediation of market activities that is dependent on short-term funding or on secured funding of client assets | Broker-dealers, securities finance companies |
| **EF4** | Facilitation of credit creation | Credit insurance companies, financial guarantors, monolines |
| **EF5** | Securitisation-based credit intermediation and funding of financial entities | Securitisation vehicles, structured finance vehicles, asset-backed securities |

The FSB employs a process of review and discussion among participating jurisdictions to help enhance consistency in the classification of entities/activities and shed light on new issues.[63] Achieving consistency of EF classification is an iterative process, reflecting both improvements in data availability and in the assessment of non-bank financial entities' involvement in the different EFs as authorities learn from collective information-sharing in successive exercises. At the same time, new developments in financial markets may result in additional areas in which guidance may be needed. Additional refinement of the classification guidance used in the FSB's annual monitoring exercise will help further improve accuracy and consistency in the relevant authorities' assessments going forward, especially as financial entities often provide their services across several jurisdictions.

The relationship between MUNFI ($183.6 trillion for the *29-Group*) and the EF-based narrow measure presented in this section ($50.9 trillion) is illustrated in Exhibit 4-2 and Annex 1. Obtaining the narrow measure involves the following steps:

(i) *Insurance corporations, pension funds, financial auxiliaries and OFIs not classified into any of the five EFs* are excluded. These entities, which do not tend to directly engage in credit intermediation or have been assessed as not being involved in liquidity/maturity transformation, leverage, and/or imperfect credit risk transfer, totalled $120.8 trillion at end-2018. *OFIs not classified into any EFs in the 2019 monitoring exercise* include mainly CFIMLs ($22.3 trillion) and equity funds ($20.0 trillion). Details of these and other OFIs not included in the narrow measure are listed in Annex 3.

[61] The FSB Policy Framework acknowledges that the narrow measure may take different forms across jurisdictions due to different legal and regulatory settings as well as the constant innovation and dynamic nature of the non-bank financial sector. It also enables authorities to capture new structures or innovations that may create financial stability risks from NBFI, by looking through to their underlying economic functions and risks. Thus, the entity types listed should be taken as typical examples. For details, see FSB (2013).

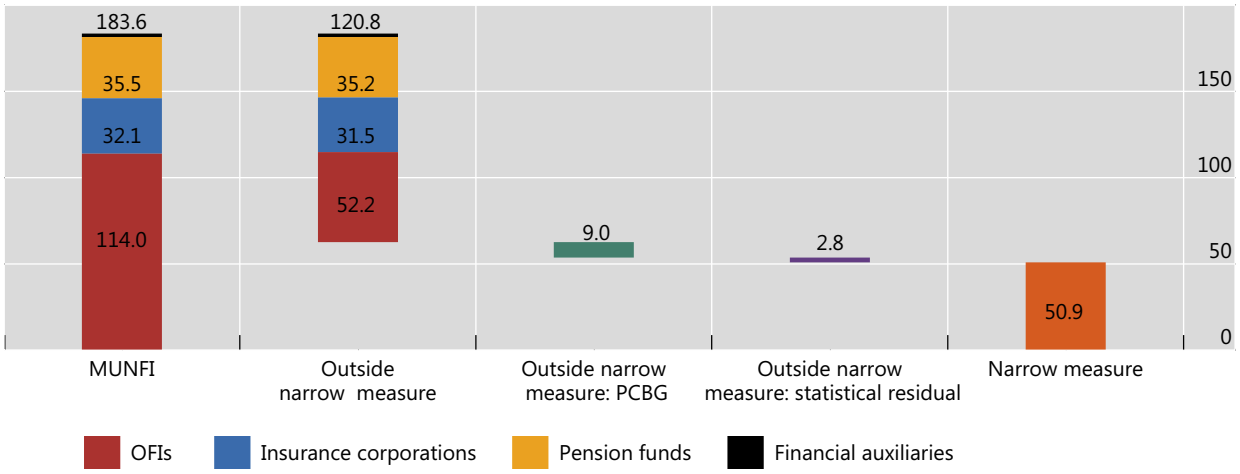
[62] Credit hedge funds are hedge funds that invest primarily in credit assets (eg bonds, loans).

[63] The FSB's 2015-16 shadow banking peer review also stressed the importance of resolving material differences of view, thereby promoting greater consistency in the classification of non-bank financial entities. See Box 4-1 of FSB (2017b).

(ii) *Entities prudentially consolidated into banking groups are excluded*. These entities are part of a banking group and already subject to consolidated prudential regulation and supervision (ie Basel II/III framework), including for maturity/liquidity transformation, leverage, and imperfect credit risk transfer, and are therefore excluded from the narrow measure.[64] These banking group consolidated entities typically include bank-owned/affiliated broker-dealers, finance companies and SFVs. Self-securitisation (or retained securitisation) assets are also excluded from the narrow measure, as under prudential consolidation rules they are treated as banking groups' own assets.[65] The amount of prudentially consolidated assets, including self-securitisation, as of end-2018 was $9.0 trillion.

Narrowing down from MUNFI

29 jurisdictions at end-2018, in USD trillion Exhibit 4-2




PCGB = assets of classified entity types which are prudentially consolidated into a banking group; Statistical residual = reported residual OFIs generated by the difference between total OFIs and the sum of all known sub-sectors therein.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

(iii) The *statistical residual* category, consisting of residuals generated in some jurisdictions' national financial accounts (NFA), is excluded from the narrow measure. These residuals are the difference between a jurisdiction's total OFI financial assets, as they are published in sectoral balance sheet statistics, and the sum of all known sub-sectors therein. While in theory this residual should be zero, in practice it is quite large in some jurisdictions. This may be the consequence of inconsistencies between "top-down" NFA estimates and "bottom-up" coverage of OFI sub-sectors, as well as challenges in aligning these two approaches, and differences in data granularity. These residuals totalled $2.8 trillion at end-2018 (1.5% of MUNFI assets). While further understanding of the identified residuals is needed going forward, the narrow measure excludes

[64] Non-bank entities that are not prudentially consolidated into banking groups, but are individually subject to Basel-equivalent regulation, are not excluded from the narrow measure in this step.

[65] Self-securitisation/retained securitisation vehicles take loans from a bank and turn these into debt securities to be used by the same bank as collateral, should the need arise, for accessing central bank funding.

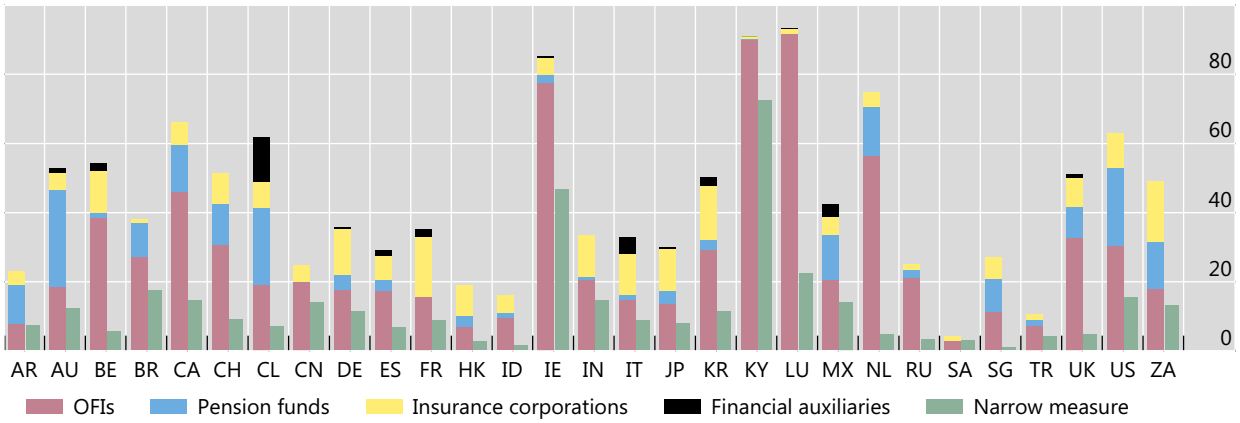
these residuals, given uncertainty about the actual entities/activities included in this residual, and in order to avoid major inconsistencies across jurisdictions.[66]

In addition to the five EFs, the narrow measure also includes about $1.1 trillion of assets which are included in an "unallocated" category. This category includes non-bank financial entities that authorities did not clearly assign to a specific EF, but either assessed these entities to be involved in credit intermediation or could not determine that they should be excluded from the narrow measure.[67]

The resulting narrow measure was $50.9 trillion at end-2018 representing 27.7% of MUNFI assets and 13.6% of total financial assets. In general, the narrow measure amounted to a larger share of MUNFI in EMEs than in advanced economies; however, this varied significantly across jurisdictions (eg ranging from 3.2% in Singapore to 79.5% in the Cayman Islands). Exhibit 4-3 compares the components of MUNFI to the narrow measure by jurisdiction, each displayed as a percentage of total national financial assets.

Narrowing down by jurisdiction

*29-Group*, end-2018; as a percentage of total financial assets — Exhibit 4-3




Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

[66] Residuals were reported by Germany, Ireland, Italy, Japan, the Netherlands, Russia, and Switzerland. The $2.8 trillion includes assets of OFIs that were neither classified into the narrow measure nor identified by jurisdictions as being outside the narrow measure. However, if conservatively assessed, this statistical residual of $2.8 trillion may be added to the $50.9 trillion narrow measure. The statistical residual should be distinguished from the unallocated category described below, through which authorities included entities in the narrow measure that could not clearly be assigned to a specific EF.

[67] Over time the size of this unallocated NBFI category may decrease to some extent as authorities, with better data and analysis, will be able to classify them into one of the five EFs or exclude them from the narrow measure. In some cases, however, the entities or activities will remain in the unallocated category, as they are assessed to be involved in credit intermediation but do not fit into one of the EFs.

## 4.2. Narrow measure trends

### *4.2.1. Global trends*

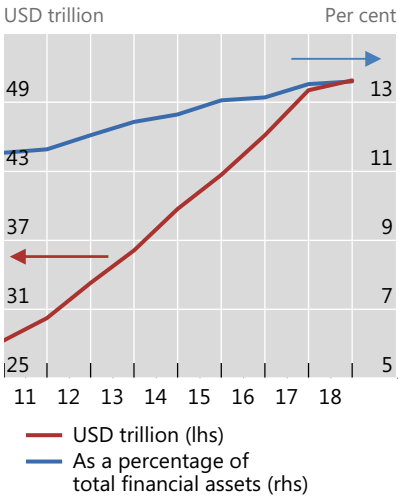
The total financial assets of entities in the narrow measure grew by 1.7% in 2018, compared to a 0.6% decline in MUNFI.[68] This growth rate is significantly lower than the average annual growth rate (8.5%) of the narrow measure over 2012-17.[69]

The narrow measure has grown faster than GDP since 2012, increasing to 77% of all participating jurisdictions' GDP in 2018 from 64% in 2012. This trend is observed in most jurisdictions, as indicated by the dots above the 45°-line in the right panel of Exhibit 4-4. Strong growth in the narrow measure reflects that EMEs, in particular, have seen increases in the provision of financial services, albeit from a low base. As a share of total global financial assets, the narrow measure has increased slightly to 13.6% at end-2018 from 12.1% in 2011 for the 29 jurisdictions.

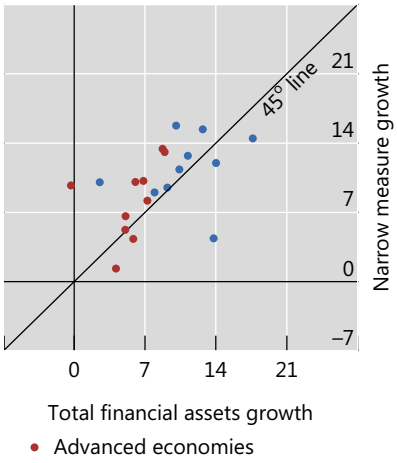
Narrow measure, total financial assets and GDP[1]

*29-Group* Exhibit 4-4

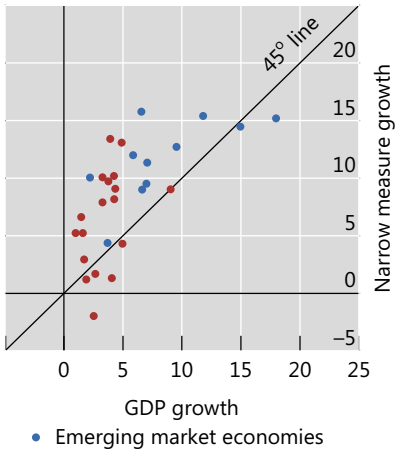
Narrow measure in USD trillion and relative to total financial assets




Total financial assets and narrow measure growth 2012-18




GDP growth and narrow measure growth 2012-18




[1] Changes in aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level. Due to data gaps, China's growth rate is based on data from 2013-18; Russia's and Argentina's growth rates are based on data from 2014-18.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *4.2.2 Developments across jurisdictions*

Out of 29 jurisdictions, 23 reported a lower annual growth rate for the narrow measure in 2018 than in 2017 (Exhibit 4-5). Eight jurisdictions reported a decline in the narrow measure, with the largest decline in dollar terms reported by China. This is mainly due to changes in EF5, discussed in more detail in Section 4.8.

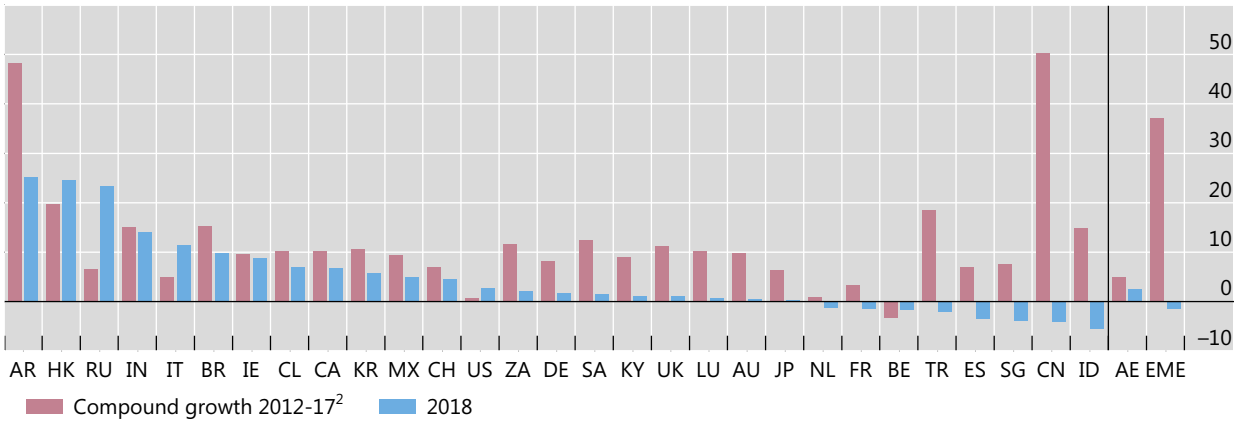
[68] Based on the *29-Group* sample.

[69] Growth rates have been calculated based on historical data included in jurisdictions' 2019 submissions. In some cases, particularly prior to 2011, changes in the value of cross-jurisdiction aggregates may also reflect improvements in the availability of data over time at a jurisdictional level.

The decline in China's narrow measure also drove the decline in the narrow measure of EMEs, while the narrow measure of advanced economies increased marginally, mainly as a result of an increase in the narrow measure of Ireland and the US. Five jurisdictions saw their narrow measure increase by over 10% (Argentina, Hong Kong, India, Italy and Russia). However, the increase in some of these jurisdictions partly reflects base effects, relatively high inflation rates or changes in data samples or coverage.[70]

Annual growth of the narrow measure[1]

By jurisdiction, in per cent — Exhibit 4-5




[1] Changes in aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level. Growth rates in Argentina reflect a high rate of inflation. [2] Growth rates for Russia are from 2014-17.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

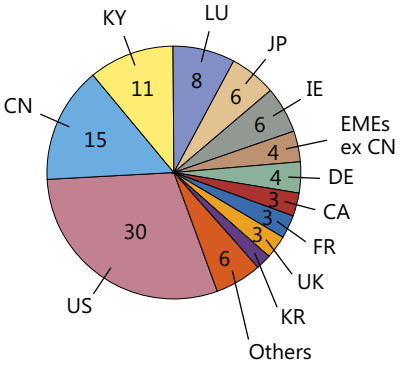
As in previous years, the US had the largest narrow measure, at $15.2 trillion in 2018, representing 29.9% of narrow measure assets reported by the 29 jurisdictions (Exhibit 4-6). The eight participating euro area jurisdictions comprised the next largest share (with a combined $12.0 trillion, 23.6%), followed by China ($7.8 trillion, 15.4%), the Cayman Islands ($5.5 trillion, 10.7%), and Japan ($3.0 trillion, 5.8%). The US share of the narrow measure has declined since 2014, whereas the shares accounted for by China and Ireland have increased over the same period.

[70] The increase in Hong Kong is entirely driven by growth in EF2 assets in 2018, which is mainly attributable to changes in data samples, making the figures of 2018 and 2017 not directly comparable. The increase in Russia's narrow measure is also due to changes in data: a new structure of investment funds' categories was established in Russia from end-September 2017 which made it impossible to keep the previous classification of entities within Russia's EF1 data.

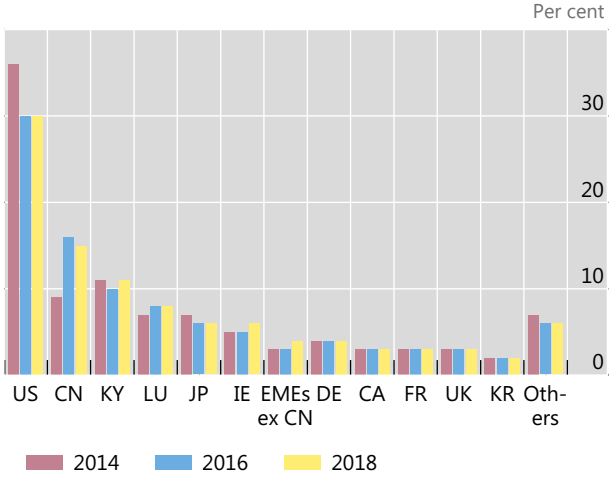
Share of the total narrow measure

*29-Group* Exhibit 4-6

At end-2018, in per cent[1]




Historical evolution of the shares by jurisdiction[1]




[1] Others include BE, CH, ES, HK, IT, KR, NL and SG. Changes in aggregated data may also reflect improvements in the availability of data over time at a jurisdictional level.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## 4.3. Composition of the narrow measure

Exhibit 4-7 details the size and recent growth of the narrow measure as well as its components, while Exhibit 4-8 illustrates the composition and growth of the narrow measure over time.[71]

The narrow measure by economic function

*29-Group* Exhibit 4-7

| | Narrow measure | EF1 | EF2 | EF3 | EF4 | EF5 | Unallocated[1] |
|---|---|---|---|---|---|---|---|
| **Size at end-2018** (USD trillion) | 50.9 | 36.6 | 3.6 | 4.5 | 0.3 | 4.7 | 1.1 |
| **Share of narrow measure** (%) | 100.0 | 72.0 | 7.0 | 8.8 | 0.6 | 9.3 | 2.3 |
| **Growth in 2018** (year-over-year, %) | 1.7 | 0.4 | 6.9 | 8.7 | 5.0 | 0.0 | 9.5 |
| **Growth 2012-17** (annualised growth, %) | 8.5 | 11.0 | 3.8 | 2.3 | 10.1 | 1.7 | 9.3 |

[1] Unallocated = assets of entities that were assessed to be involved in bank-like financial stability risks from NBFI, but which could not be assigned to a specific EF.

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

The individual EFs that make up the narrow measure continued to grow at different rates in 2018. EF2 assets (*loan provision that is dependent on short-term funding*) and EF3 assets (*intermediation of market activities dependent on short-term funding)* grew at the highest

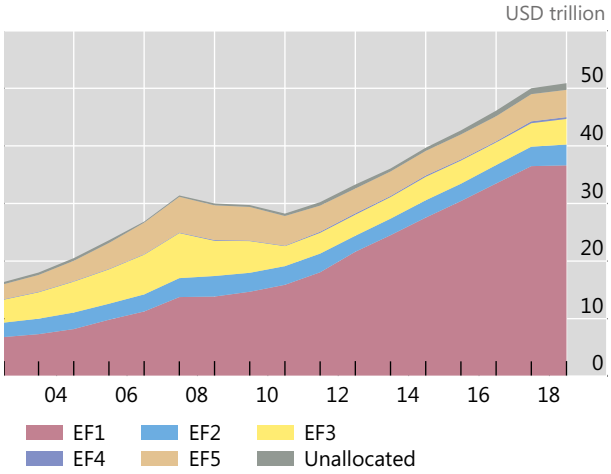
[71] The results reported here are not strictly comparable to those presented in previous Reports due to the addition of new jurisdictions, improvements in national sector balance sheet statistics, more granular reporting and revisions to historical data.

rates among EFs in 2018, at growth rates much higher than average annual growth rates between 2012 and 2017. In contrast, while EF1 assets (*management of collective investment vehicles with features that make them susceptible to runs*) grew at the highest annual growth rate between 2012 and 2017, the growth rate in 2018 was significantly lower. Similarly, the growth rate of EF4 assets (*facilitation of credit creation*) was lower in 2018, while EF5 assets (*securitisation-based credit intermediation and funding of financial entities)* remained unchanged.[72]

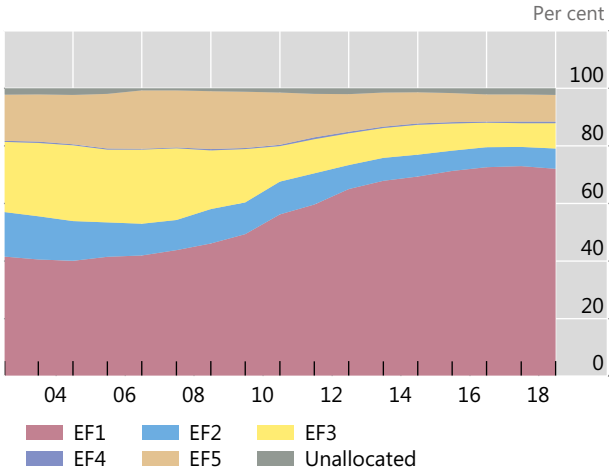
Classification by economic function[1]

*29-Group* Exhibit 4-8

Evolution of the narrow measure by economic function




Share of the narrow measure, per economic function




Unallocated = assets of entities that were assessed to be involved in NBFI, but which could not be assigned to a specific economic function.

[1] Net of entities prudentially consolidated into banking groups.

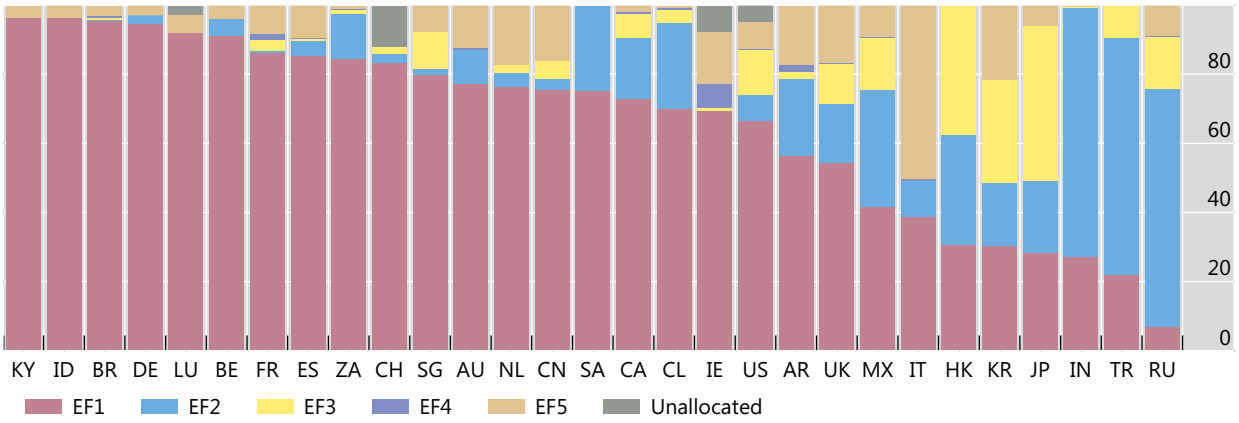
Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Since the financial crisis, growth of the narrow measure has been driven primarily by investment funds, as opposed to pre-crisis growth, which was driven to a large degree by entity types such as SFVs and broker-dealers that often received support from banks. As a result, EF1 assets have been increasing as a share of total narrow measure assets since the global financial crisis. Despite recording a significantly lower growth rate in 2018 than in earlier years, it remained the largest EF in aggregate and also in 22 jurisdictions at end-2018. However, EF2 continued to be the largest EF in India, Russia and Turkey. Meanwhile, EF3 remained the largest EF in Hong Kong and Japan (Exhibit 4-9). In the subsequent sections each of the economic functions are discussed in turn.

[72] The "unallocated" category grew by 9.5% in 2018, primarily driven by the US (due to growth of funding corporations).

Economic function classification by jurisdictions[1]

By jurisdiction, at end-2018, as a percentage of the narrow measure in each jurisdiction — Exhibit 4-9




Unallocated = assets of entities that were assessed to be involved in NBFI, but which could not be assigned to a specific economic function.

[1] Net of entities prudentially consolidated into banking groups.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

**Financial stability risk metrics** **Box 4-1**

To monitor and assess the potential risks to financial stability associated with the entity types classified into the different EFs, a set of on- and off-balance sheet data were collected in relation to: maturity transformation; liquidity transformation; imperfect credit risk transfer; and leverage.[73] These data were collected for 2016, 2017 and 2018, in order to obtain insights on how potential financial stability risks associated with these entity types may be evolving. These data were also collected for the five largest entities within an entity type in a jurisdiction, to help understand how risks may be concentrated. Exhibit 4-10 provides an overview of collected on- and off-balance sheet items and calculated risk metrics.

On- and off-balance sheet items and risk metrics* — Exhibit 4-10

| Examples of risk metrics | Definition and range |
|---|---|
| **Credit intermediation** (CI)<br>$CI1 = \frac{\text{credit assets}}{\text{total financial assets}}$<br>$CI2 = \frac{\text{loans}}{\text{total financial assets}}$ | These metrics compare the amount of credit assets and loans held by a particular entity type to its total assets (**CI1** and **CI2**, respectively). As loan assets are part of wider credit assets, CI2 can be viewed as a sub-set of CI1.<br>These metrics fall between 0 and 1, with higher values showing more involvement in credit intermediation while "0" indicating no involvement in credit intermediation. |

[73] For the largest three entity types classified into each EF (where assets exceed 1% of the total national financial assets), authorities were asked to report balance sheet items on a gross basis, ie reporting weighted averages of all entities making up a particular entity type. If gross reporting was not feasible, authorities reported the weighted averages of a sample pool (eg the largest three entities, by assets, for an entity type) for some entity types, or other relevant proxies.

| | |
|---|---|
| **Maturity transformation** (MT)<br>$\text{MT1} = \frac{\left(\begin{array}{c}\text{long-term assets} - \text{equity} \\ - \text{long-term liabilities}\end{array}\right)}{\text{total financial assets}}$<br>$\text{MT2} = \frac{\text{short-term liabilities}}{\text{short-term assets}}$ | **MT1** is the portion of long-term assets (>12 month maturity) funded by short-term liabilities (≤ 30 days) (ie not funded by equity or long-term liabilities), scaled by the entity type's total financial assets. It falls between −1 and +1, with 0 indicating no maturity transformation, and negative values implying negative maturity transformation.<br>**MT2** is the ratio of short-term liabilities (plus redeemable equity in the case of EF1 entity types) to short-term assets. A value of 1 indicates that short-term liabilities (plus redeemable equity for EF1) are fully covered with short-term assets. Above 1, increases in the ratio indicate that there could be short-term funding dependence. Ratios from 0 to 1 indicate negative maturity transformation. |
| **Liquidity transformation** (LT)<br>$\text{LT1} = \frac{\left(\begin{array}{c}\text{total financial assets} - \text{liquid assets (narrow)} \\ + \text{short-term liabilities}\end{array}\right)}{\text{total financial assets}}$<br>$\text{LT2} = \frac{\left(\begin{array}{c}\text{total financial assets} - \text{liquid assets (broad)} \\ + \text{short-term liabilities}\end{array}\right)}{\text{total financial assets}}$ | **LT** measures the amount of less liquid assets (total financial assets minus liquid assets) funded by short-term liabilities (and/or shares redeemable for cash or underlying assets in the case of CIVs), approximated by short-term liabilities minus liquid assets (under a narrow definition for **LT1** and a broad definition for **LT2**).** Total financial assets are also added to the numerator to obtain interpretable results, with a value of "1" indicating no liquidity transformation (ie all near-term demands on liquidity are supported by liquid assets) and "2" indicating that assets are less liquid and are funded by short-term liabilities, including redeemable equity. |
| **Leverage** (L)<br>$\text{L} = \frac{\text{total financial assets}}{\text{equity}}$ | **L** is the ratio of total financial assets to equity (or AUM to NAV in the case of CIVs). The results can be interpreted as a financial leverage ratio or equity multiplier; however, these are not risk-based measures. Although this measure enables comparisons across entity types, it does not take into account non-bank financial entities' leveraging or de-leveraging through the use of derivatives and other off-balance sheet transactions (ie synthetic leverage). |
| * For EF1 entity types, the collected balance sheet data and calculated risk metrics were expanded to also include assets under management (AUM) instead of total financial assets, Gross Notional Exposure and Net Asset Value (to calculate leverage ratios), and non-/redeemable equity (as a form of long-/short-term liability). Ratios related to imperfect credit risk transfer were also considered in past monitoring exercises. However, collected data were not sufficient to allow any meaningful conclusions. In particular, off-balance sheet data items such as off-balance sheet credit exposures were often not available across jurisdictions. ** Liquid assets are difficult to measure as the liquidity of an asset at any given time is contingent on a number of external factors. For the purposes of the FSB's monitoring exercise, liquid assets are considered to be all assets that can be easily and immediately converted into cash at little or no loss of value during a time of stress (see also characteristics and definition of High Quality Liquid Assets (HQLAs) in Part 1, Section II.A in BCBS (2013). Two definitions of liquid assets are used in this exercise: in the narrow definition, liquid assets only include cash and cash equivalents; in the broad definition, liquid assets include HQLAs, which can include cash and cash equivalents, but also certain debt and equity instruments that meet certain liquidity characteristics (subject to concentration limits and haircuts). | |

Although the reporting of on-balance sheet data for classified entity types has improved compared to the 2018 monitoring exercise, gaps remain in reported data particularly in relation to off-balance sheet data.[74] Some jurisdictions continue to face significant challenges collecting these data, in part because regulatory data collection of various non-bank financial entities is not sufficiently granular, and sectoral balance sheet data often do not provide specific breakdowns with respect to maturity and liquidity factors.[75] For particular entities and entity types, some jurisdictions were not able to distinguish between their credit intermediation (and hence related risks) and their non-credit intermediation activities, which may affect the calculated risk metrics.[76] In addition to data gaps, differences in the accounting

[74] For definitions of the balance sheet items used to compute risk metrics, please see the reporting templates that are published on the FSB website with this Report.

[75] Where only some jurisdictions are able to provide risk metrics, the collected sample may reflect selection bias.

[76] For example, some jurisdictions reported data for all funds, rather than only funds involved in credit intermediation. This may result, for example, in lower credit intermediation metrics.

standards and the treatment of certain aspects of risk data also posed challenges in comparing financial stability risks posed by similar entity types in different jurisdictions.[77]

The sample size for calculating risk metrics represents national aggregates rather than individual entities. Thus, one jurisdiction's data submission of sector aggregates would typically include many individual entities that range from large to small entities. Due to data limitations, some of the exhibits and results presented in Sections 4.4-4.8 come from a sub-sample of jurisdictions and should therefore not be extrapolated to describe the entire sample of jurisdictions. More specifically, any conclusion from the data related to the sub-sample may not apply to all of the jurisdictions that are covered in this Report. However, to the extent possible, this Report discusses observations and trends that can be gleaned from the reported data.

The FSB will continue to advance the work on the risk analysis in future monitoring exercises, through focused work to refine risk metrics so that they are better tailored to the business models of the entities in each of the EFs. The FSB will also seek to make better use of widely available data, minimise the challenges presented by significant data gaps, and better assess the bank-like risks that NBFI may pose to financial stability.

## 4.4. Economic Function 1

EF1 comprises collective investment vehicles (CIVs) with features that make them susceptible to runs (eg fixed income funds, mixed funds, MMFs, credit hedge funds, real estate funds and exchange-traded funds (ETFs)). CIVs may act as shock absorbers in the financial system as losses from an entity's distress or insolvency or from adverse financial market conditions are shared among a disparate group of investors. In extreme circumstances, however, some CIVs with maturity/liquidity transformation and/or leverage can be susceptible to runs. To address potential run risk, many jurisdictions have mandated risk mitigating features for some or all of their EF1 entities.[78]

### *4.4.1. Trends in Economic Function 1*

In 2018, EF1 assets grew by 0.4%, significantly slower than in past years (Exhibit 4-11), to $36.6 trillion or 72.0% of the narrow measure. EF1 assets declined in 13 out of 29 jurisdictions in 2018. As valuation effects typically constitute a significant driver of EF1 assets growth (see Case Study 5.1), this development has to be considered in the context of the challenging financial market conditions in the reporting period.

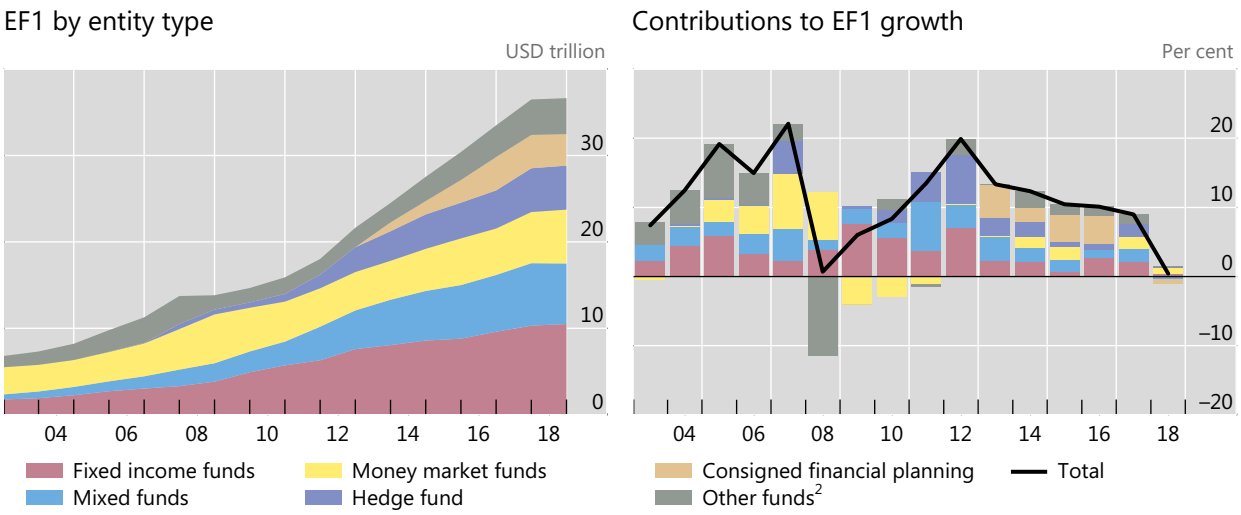
[77] For example, some risk metrics include data from entities prudentially consolidated into banking groups, as some jurisdictions' granular data do not distinguish between consolidated and non-consolidated entities. Also, some jurisdictions classified the equity assets of funds as long-term assets, while others treated them as short-term assets. Furthermore differences arose for example because some jurisdictions reported total financial assets, while others reported total net assets for EF1 entities. This contributes to the challenges in comparing calculated risk metrics. The FSB, through the Experts Group, has been working on improving consistency and will continue to do so going forward.

[78] For example, structural features that mitigate risk include asset allocation requirements, liquidity risk management-requirements, leverage limits, and loan origination bans. Post mitigant tools designed to limit the probability and impact of stressed scenarios include redemption fees, withdrawal gates, and swing pricing.

The largest share of EF1 assets are held in the US (with 27.5% of total EF1 assets), China (16.1%), the Cayman Islands (14.3%), and Luxembourg (9.6%). The share of EF1 assets held by EMEs has remained constant over the past three years (20%).

Economic Function 1 trends and composition[1]

*29-Group* Exhibit 4-11




[1] Changes in EF1 assets may also reflect improvements in the availability of data over time at the jurisdiction level. [2] Other funds include investment funds not displayed separately such as referenced investment funds, external debt investment funds, ETFs, equity funds, currency funds, asset allocation funds, other closed-ended funds, funds of funds, REITs, and trust companies. Equity funds include open ended equity funds holding more than 20% credit assets.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

In 2018, the assets of fixed income funds, MMFs and hedge funds, real estate funds and ETFs increased, whilst those of mixed funds, consigned financial planning and trust companies decreased. Despite the divergent growth rates, the breakdown by EF1 entity types has remained relatively unchanged since 2016, with fixed income funds, mixed funds and MMFs remaining the three largest EF1 entity types.

The majority of fixed income fund assets are held in the US (39% of global fixed income assets), Luxembourg (15%) and Ireland (6%). The US holds the largest share of global mixed fund assets (20%) with Luxembourg and Germany holding 16% each and the Cayman Islands 9%.

The majority of MMF assets are held in the US (53% of global MMF assets), China (18%), Ireland (9%), France (6%) and Luxembourg (6%). US government MMFs[79] comprised most of the assets of the US MMF sector, reflecting a shift in assets from prime MMFs (which invested primarily in corporate debt securities) to government MMFs, following the US MMF regulatory reforms that came into effect in 2016. The regulatory structure of US government MMFs requires these funds to primarily hold government securities, repos backed by those securities, and cash.[80] Funds offering constant (stable) net asset value (NAV) accounted for 33% of global MMF assets, and represented the largest type of MMFs

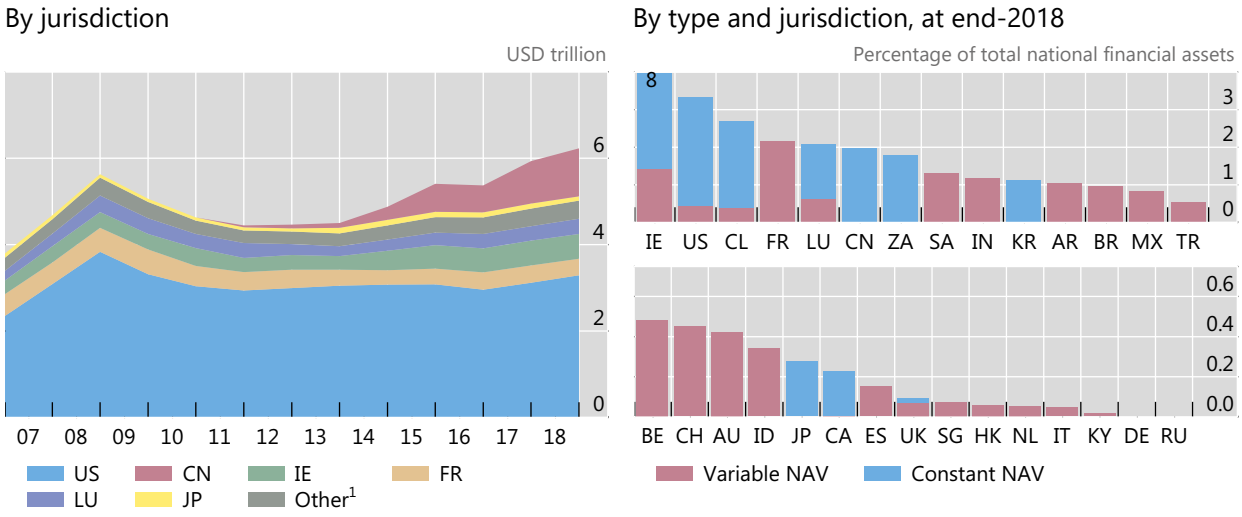
[79] US government MMFs include US Treasury MMFs, which are required to invest: (i) 99.5% of their assets in US government securities, or repos collateralised by US government securities or cash; and (ii) at least 80% of their assets in US Treasury securities or repos collateralised by US Treasury securities or cash.

[80] See Box 2-2 in FSB (2018a).

in nine jurisdictions (Exhibit 4-12). In 2018 MMF asset growth has continued, largely driven by growth in China and the US where MMF assets increased by 13% and 5%, respectively. Across jurisdictions, growth varied significantly, with MMF assets declining in 10 jurisdictions, including in France, Japan and Korea.

Assets of MMFs

*29-Group* Exhibit 4-12




[1] Other = Other jurisdictions in *29-Group* not displayed separately

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *4.4.2 Financial stability risk metrics for EF1*

For the 2019 monitoring exercise, more jurisdictions submitted the data elements used to calculate risk metrics for most EF1 entity types, compared to previous exercises. Due to differences in the business models of the three largest EF1 entity types, there are significant differences across EF1 entity types in the statistical distribution of the risk metrics measuring credit intermediation, maturity transformation, liquidity transformation and leverage. In general, MMFs and fixed income funds show higher levels of credit intermediation than mixed funds, while the level of maturity transformation is the highest for fixed income funds and mixed funds. The dispersion of the maturity transformation metrics is also high for these funds. Furthermore, the liquidity transformation metrics are high (close to the upper bound of 2) for major EF1 entity types, in particular for fixed income funds. This indicates that these funds have short-term liabilities and short-term redeemable equity (shares) in excess of liquid assets. Entities in many jurisdictions (particularly EMEs) had much lower levels of liquidity transformation when taking into account a broader class of liquid assets.[81] This may imply that liquidity risk management would be more challenging for some funds during times of market stress.

[81] In some cases, differences in the risk metrics across jurisdictions might also be caused by differences in the classification of asset classes (eg as liquid or less liquid assets) across jurisdictions. The FSB will continue to work on further improvements in risk metrics and their analysis.

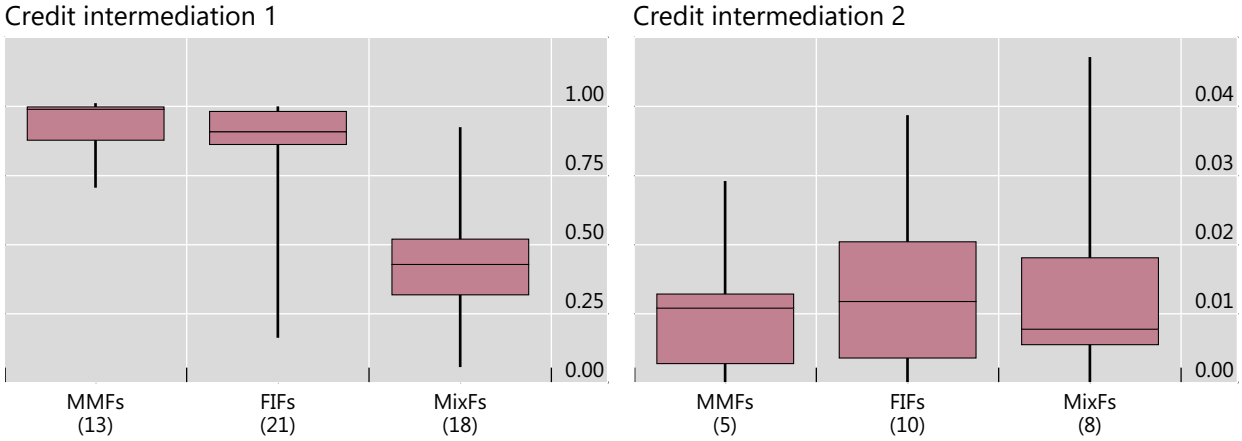
### *(i) Credit intermediation*

The credit intermediation metrics for the largest three EF1 entity types are shown in Exhibit 4-13. The ratio of credit assets to assets under management (AUM), CI1, continued to be higher for MMFs and fixed income funds than for mixed funds. This reflects the different business models of these funds: mixed funds hold a wider range of assets, including higher levels of non-credit assets such as equities. In comparison to 2017, the median values of CI1 increased for MMFs and fixed income funds, but decreased for mixed funds.

The ratio of loans to AUM, CI2, continued to be much lower and close to zero for all three entity types, indicating very limited direct lending by the largest EF1 entities.[82]

Credit intermediation

Sample size in parentheses[1] Exhibit 4-13




MMFs = money market funds; FIFs = fixed income funds; MixFs = mixed funds.

The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample.

[1] The sample size indicates the number of jurisdictions submitting the relevant data. Each jurisdiction's data submission reflects data from many individual entities within that jurisdiction.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(ii) Maturity transformation*

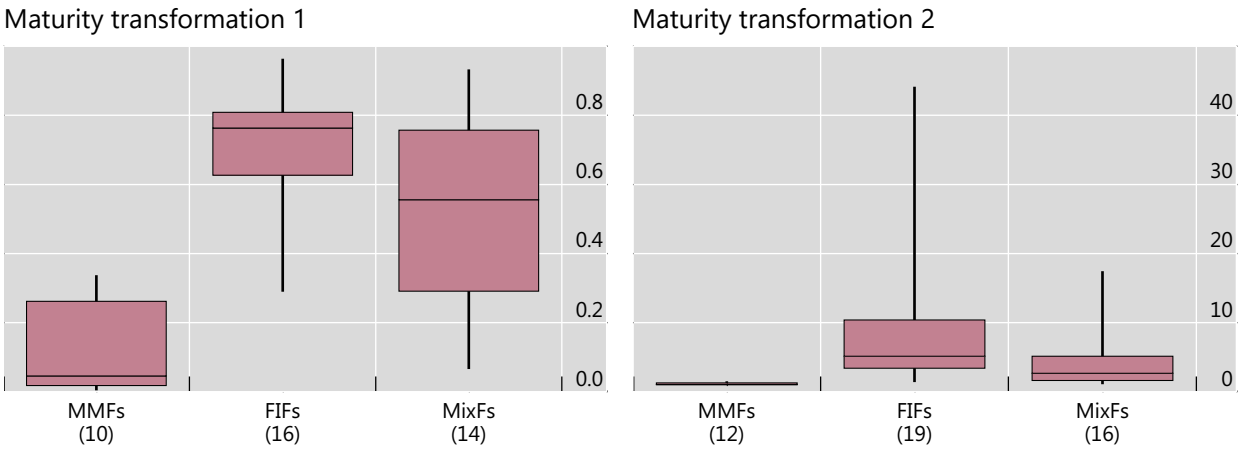
Most EF1 entity types were involved in some degree of maturity transformation as can be seen by the positive MT1 values (the ratio of long-term assets funded by short-term liabilities plus redeemable equity to total financial assets) across all fund types (Exhibit 4-14). Given divergent business models, the median MT1 value for MMFs (0.04) is significantly lower than for other funds (0.80 for fixed income funds and 0.53 for mixed funds) with considerable variance, especially for mixed funds, across jurisdictions.[83]

[82] Some funds invest in shares of loan funds or securities issued by CLOs, and are thus exposed to loan risks.

[83] Such variance may be caused by differences in the classification of asset classes (eg as short- or long-term assets) across jurisdictions. The FSB will continue to work on further improvements in risk metrics and their analysis.

Maturity transformation

Sample size in parentheses[1] Exhibit 4-14




MMFs = money market funds; FIFs = fixed income funds; MixFs = mixed funds.

The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample.

[1] The sample size indicates the number of jurisdictions submitting the relevant data. Each jurisdiction's data submission reflects data from many individual entities within that jurisdiction.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Another measure of maturity transformation, the ratio of short-term liabilities and redeemable equity to short-term assets (MT2), showed some of these funds, notably fixed income funds, to be funding a portion of their long-term assets with short-term liabilities. They thus may be vulnerable to periods of diminished market liquidity. MT1 and MT2 metrics increased slightly for fixed income and mixed funds compared to 2017, but remained largely unchanged for MMFs.

### *(iii) Liquidity transformation*

Fixed income funds, mixed funds and MMFs continued to have high liquidity transformation metrics. The median LT1 value (the ratio of less-liquid assets funded by short-term liabilities, using a narrow definition of liquid assets)[84] was near the upper limit of two for MMFs (1.76), fixed income funds (1.93) and mixed funds (1.90) in 2018. In all jurisdictions that reported the relevant data, LT1 is larger than 1 indicating that short-term liabilities and redeemable equity were in excess of liquid assets (Exhibit 4-15).[85]

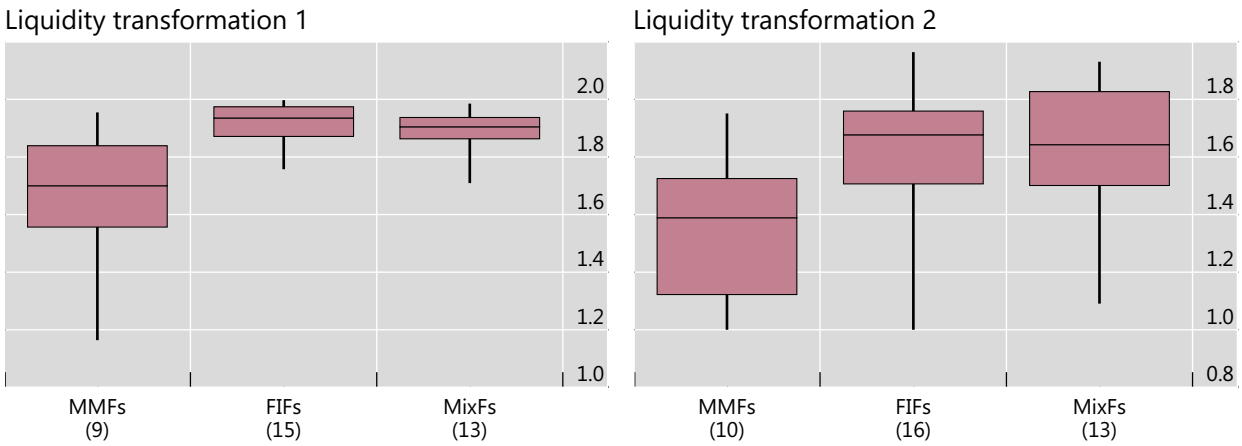
Median LT2 values (the ratio of less-liquid assets funded by short-term liabilities, using a broad definition of liquid assets) were higher than one, suggesting some degree of liquidity transformation for MMFs (1.39), fixed income funds (1.63) and mixed funds (1.64). Neither LT1 nor LT2 values changed much from 2017.

[84] For further details on the definition of liquid assets, see Box 4-1. As highlighted earlier, part of the variation in the risk metrics may also be caused by differences in data submission across participating jurisdictions.

[85] This ratio will be biased upwards for jurisdictions that reported total NAV in the total assets field, instead of total AUM without netting of any liabilities.

Liquidity transformation

Sample size in parentheses[1] Exhibit 4-15




MMFs = money market funds; FIFs = fixed income funds; MixFs = mixed funds.

The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample. [1] The sample size indicates the number of jurisdictions submitting the relevant data. Each jurisdiction's data submission reflects data from many individual entities within that jurisdiction.

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

In general, the relatively high LT1 and LT2 measures for EF1 entities can be attributed to the open-ended redemption structure of most of the funds classified into EF1 by jurisdictions.[86]

LT2 tends to be somewhat lower than LT1 as the types of "liquid assets" for LT2 to cover short-term liabilities and redeemable equity include high-quality liquid assets (HQLA), in addition to cash and cash equivalents. The difference between LT1 and LT2 as measured by the ratio between the two metrics varies across jurisdictions and EF1 entity types. However, similar to data reported for 2017, EMEs tend to have higher LT1 to LT2 ratios than advanced economies for MMFs and mixed funds.[87] Although more detailed analysis is needed, especially on what jurisdictions have included in HQLA in their submissions, this might indicate that funds in certain EMEs are more reliant on a broader category of assets other than cash for future potential liquidity needs. It may also imply that these funds may have more challenges in managing liquidity risk effectively during times of market stress compared to funds whose liquid assets are mostly cash or cash equivalent assets. Such potential challenges may be greater for funds with liquid assets that are mostly non-cash.

When looking at liquidity metrics (LT1) in combination with maturity transformation metrics (MT1 and MT2) for fixed income funds, a small subset of jurisdictions appear to display high levels of maturity transformation and liquidity transformation (Exhibit 4-16). However, this relationship does not seem to be particularly strong across jurisdictions. This

[86] Some jurisdictions classified closed-ended funds into EF1 for various reasons, such as insufficient information on the redemption structures of certain entity types, because the funds are leveraged or involved in credit intermediation, and/or the jurisdictions' regulations allow closed-ended funds to operate more like open-ended funds.

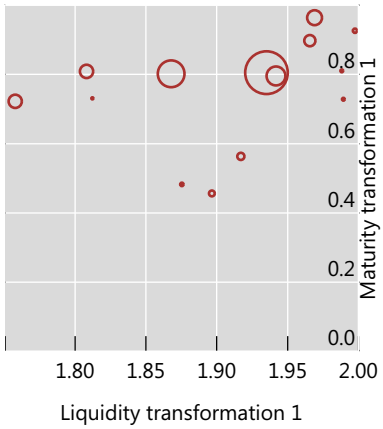
[87] The EME ratio of LT1 to LT2 tends to be higher for MMFs, followed by fixed income funds and then mixed funds, whereas the ratio for advanced economies tends to be broadly the same for all three entity types and lower than EMEs.

may, for example, indicate that funds in some jurisdictions invest in long-term assets that tend to have liquid markets, such as high-quality sovereign bonds.

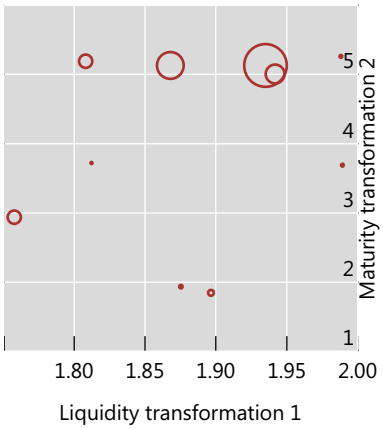
Risk metrics

At end-2018[1] Exhibit 4-16

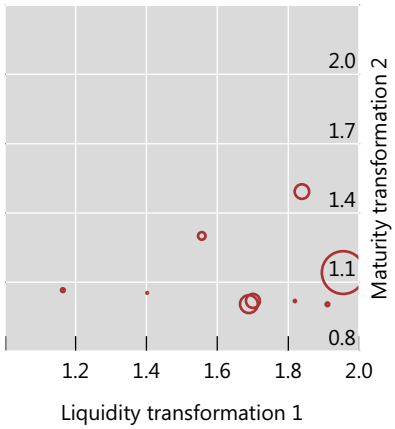
Fixed income funds - Liquidity transformation 1 vs maturity transformation 1




Fixed income funds - Liquidity transformation 1 vs maturity transformation 2




MMFs - Liquidity transformation 1 vs maturity transformation 2




[1] Size of bubble denotes the sector's absolute size.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(iv) Leverage*

Reported balance sheet leverage, as measured by AUM divided by NAV (or L1), continued to be low across the largest EF1 entity types (Exhibit 4-17): median L1 values were close to one for MMFs, fixed income funds and mixed funds, with little change from 2017. For these types of funds, many jurisdictions have regulatory limits on balance sheet leverage which lead to relatively low leverage. However, there was some cross-jurisdictional variation for fixed income and mixed funds.

As data on synthetic leverage (through the use of off-balance sheet transactions such as derivatives)[88] were only provided by some jurisdictions, examining the potential impact of synthetic leverage continues to be a challenge. Using the available data, LT2, which includes both on- and off-balance sheet leverage, shows similar cross-jurisdictional variation to LT1.

The L1 measure, for which more data is available, only provides a partial view of the leverage obtained by the relevant EF1 entities.[89] In this regard, in December 2019 IOSCO released its final recommendations on developing a framework for assessing leverage in funds in a consistent manner across jurisdictions. The report makes four recommendations to its members. Key amongst them is the use of a two-step framework, which calls for the use of either a gross notional exposure (GNE) or adjusted GNE (ie GNE adjusted for option contracts and interest rate derivatives) metric in Step One and more risk-based metrics, determined by individual jurisdictions, in Step Two. The recommendations also call on

[88] Derivatives are not necessarily accounted for off-balance sheet (see eg currency hedges with futures).

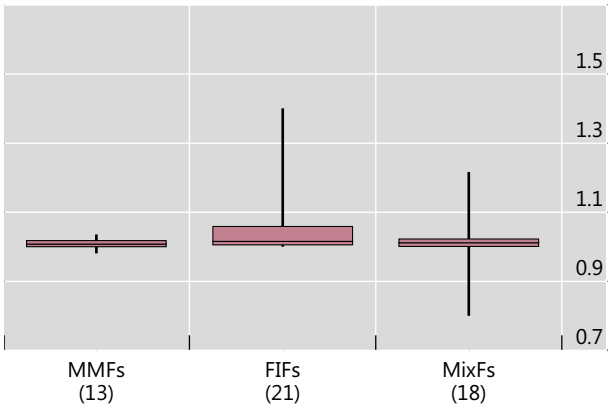
[89] For example see Box 2-3 of FSB (2018a) or IOSCO (2017) for synthetic leverage estimates for hedge funds in some jurisdictions.

IOSCO to begin collecting data in 2020. IOSCO envisages that its first leverage report will be published in 2021.

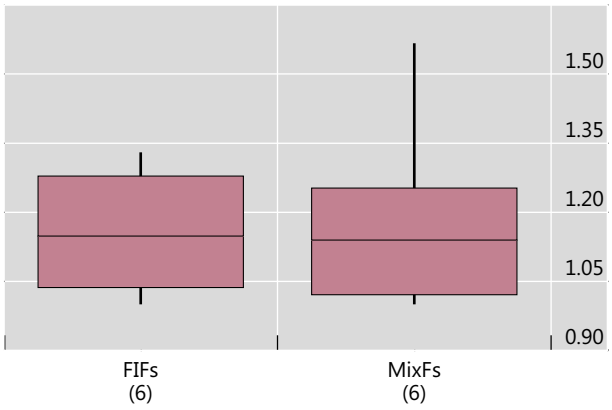
Leverage

Sample size in parentheses[1] Exhibit 4-17

Leverage 1[2]




Leverage 2[3]




MMFs = money market funds; FIFs = fixed income funds; MixFs = mixed funds.

The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample.

See Box 4-1 for metrics definitions.

[1] The sample size indicates the number of jurisdictions submitting the relevant data. Each jurisdiction's data submission reflects data from many individual entities within that jurisdiction. [2] Total financial assets/equity. [3] (Total financial assets + total off-balance sheet items)/equity

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

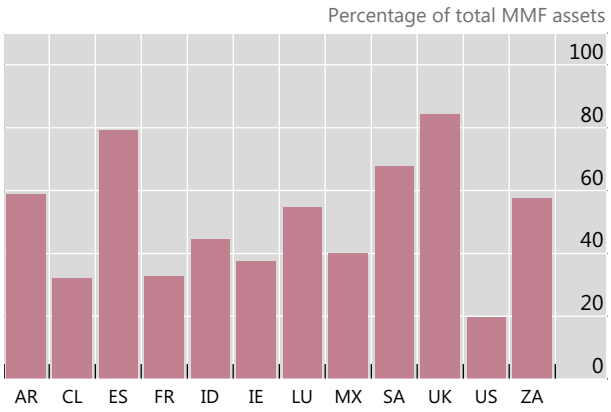
### *(v) Concentrations*

Data for the largest five EF1 entities in a jurisdiction in each entity type can help to assess market concentrations.

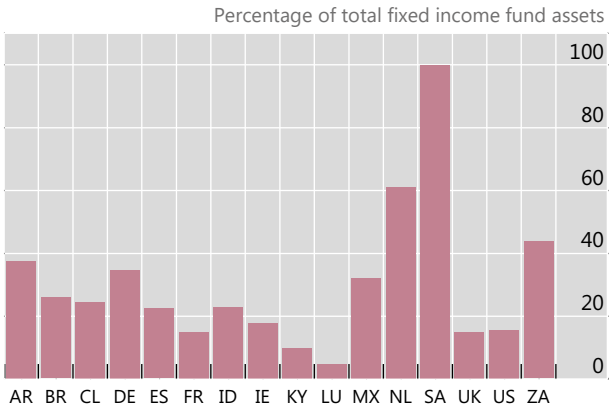
Five largest entities' share of total assets, by fund type and jurisdiction

*29-Group* Exhibit 4-18

MMFs




Fixed income funds




Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Data as at end-2018 were similar to 2017, showing large differences across jurisdictions but generally higher concentration levels for MMFs compared to fixed income funds (Exhibit 4-18). The largest five MMFs accounted for over 50% of total MMF assets in six out of the 12 jurisdictions that reported this data. However, for some of these jurisdictions the domestic MMF sector is small, and investors could be exposed to MMFs domiciled in other jurisdictions. On the other hand, fixed income funds were less concentrated in most jurisdictions, albeit highly concentrated in two jurisdictions (in which the largest five funds accounted for more than 60% of the total fixed income fund assets).

## 4.5. Economic Function 2

EF2 entities engage in loan provision that could be dependent on short-term funding (eg finance companies, leasing companies, factoring companies, consumer credit companies). Finance companies, the most prominent EF2 entity type, often specialise in areas such as consumer finance, auto finance, retail mortgage provision, commercial property finance, and equipment finance. These entities often concentrate their lending in specific sectors due to expertise and other reasons. This may create risks if the sectors they focus on are cyclical in nature. Such risks may be exacerbated if these entities are heavily dependent on short-term funding or wholesale funding, or are dependent on parent companies for funding and the parent companies are in the same cyclical sectors.[90]

### *4.5.1. Trends in Economic Function 2*

In 2018 EF2 assets grew by 6.9% to $3.6 trillion and represent 7.0% of the narrow measure (Exhibit 4-19, LHS). Finance companies[91] continue to represent the main entity type within EF2 with nearly 80% of total EF2 assets (Exhibit 4-19, RHS).

While most jurisdictions (23 out of 26 that classified entities into EF2) showed an increase in EF2 assets in 2018, the overall growth was largely driven by India and China, where EF2 assets rose by 17.4% and 15.0% respectively.[92] In contrast, EF2 assets fell significantly in the Netherlands (-8.4%).

In India, loan companies, a key type of non-bank finance companies, have expanded their lending portfolio in recent years, mainly against the backdrop of slow credit growth of commercial banks and easy liquidity. Reflecting this trend, loan companies continued to grow in 2018. The balance sheet of infrastructure finance companies, the other major category of non-bank finance companies, grew at a higher rate in 2018, because of increases in loans and advances to industries.

EF2 assets are mainly held in the US (with 30.7% of total EF2 assets), Japan (17.0%) and India (12.0%). EF2 assets in the US decreased by 0.6%, continuing a downward trend that

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90 As stated in Section 4.1, all entities classified into EFs exclude entities prudentially consolidated into banking groups.

91 In this section, the term finance companies is used to refer to a subset of the entire universe of finance companies included it in the macro-mapping section. The difference in size relates to the exclusion of prudentially consolidated entities and the more detailed breakdown provided in this section.

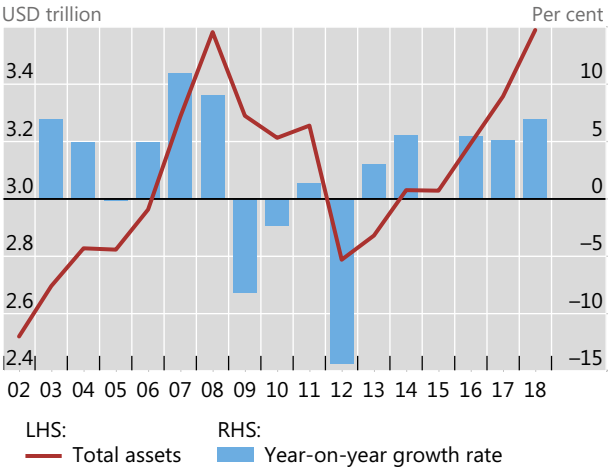
92 As noted earlier, Hong Kong also saw EF2 assets grow in 2018. However, the very high growth in EF2 assets in Hong Kong is mainly due to changes in data samples, making the 2018 figures not directly comparable to those for 2017 and earlier years.

started after 2014. The share of EF2 assets in EMEs, particularly in Asia, has continued to increase and represented 25% of total EF2 assets in 2018 (up from 16% in 2014).

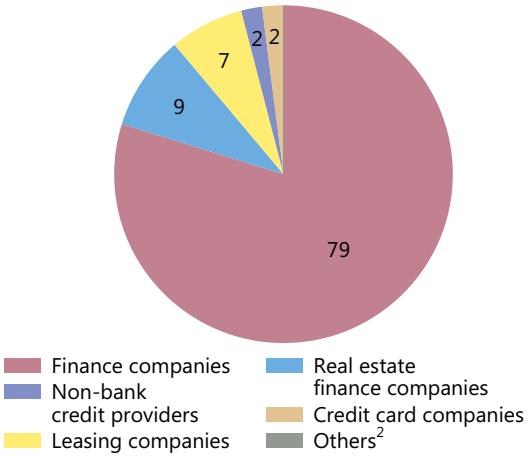
Economic Function 2 trends and composition

*29-Group* Exhibit 4-19

Financial assets level and growth[1]




Breakdown by entity type, in per cent




[1] Changes in EF2 assets may also reflect improvements in the availability of data over time at a jurisdictional level. Net of prudential consolidation into banking groups. [2] Others contains credit unions and venture capital firms.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *4.5.2. Financial stability risk metrics for EF2*

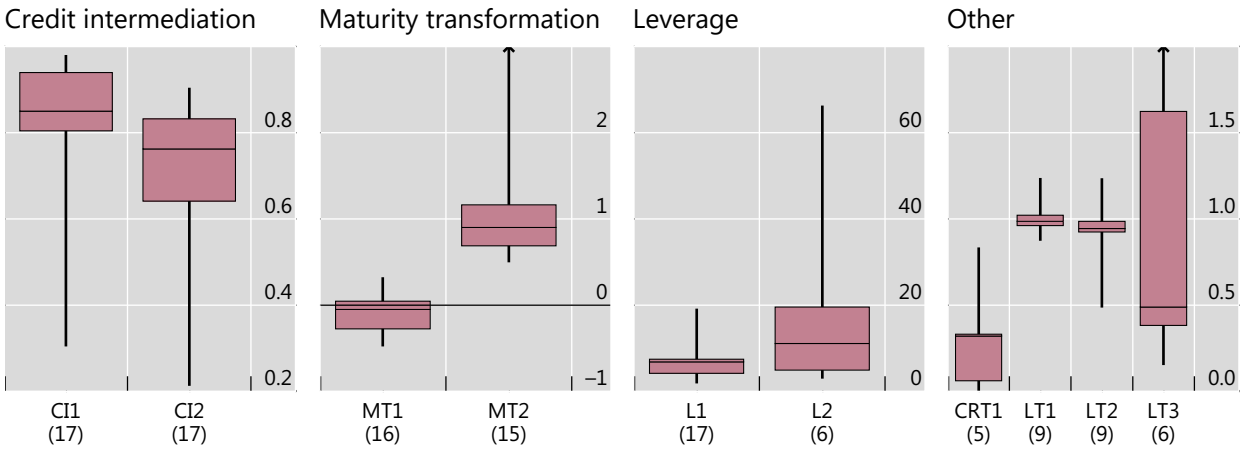
Risk metrics for finance companies, remained relatively unchanged between 2017 and 2018. The risk metrics indicate high levels of credit intermediation with a somewhat elevated degree of leverage when accounting for off-balance sheet exposures. On average it seems that finance companies are not generally involved in significant maturity transformation, however relatively high maturity transformation was observed in some jurisdictions.

#### *(i) Credit intermediation*

Finance companies continue to engage in a significant degree of credit intermediation, although the extent of credit intermediation has decreased slightly in most jurisdictions. The median values for CI1 (the ratio of credit assets to total financial assets) and CI2 (the ratio of loan assets to total financial assets) were 0.85 and 0.76 respectively in 2018, virtually unchanged from 2017.

Risk metrics for finance companies

End-2018 Exhibit 4-20




The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the vertical lines show the range of the entire sample. In some cases, arrows at the top of the vertical line indicate jurisdictions with ratios outside the range shown in the graph.

See Box 4-1 for metrics definitions. Some risk metrics included data from entities prudentially consolidated into banking groups, as some jurisdictions' granular data do not distinguish between consolidated and non-consolidated entities.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(ii) Maturity transformation*

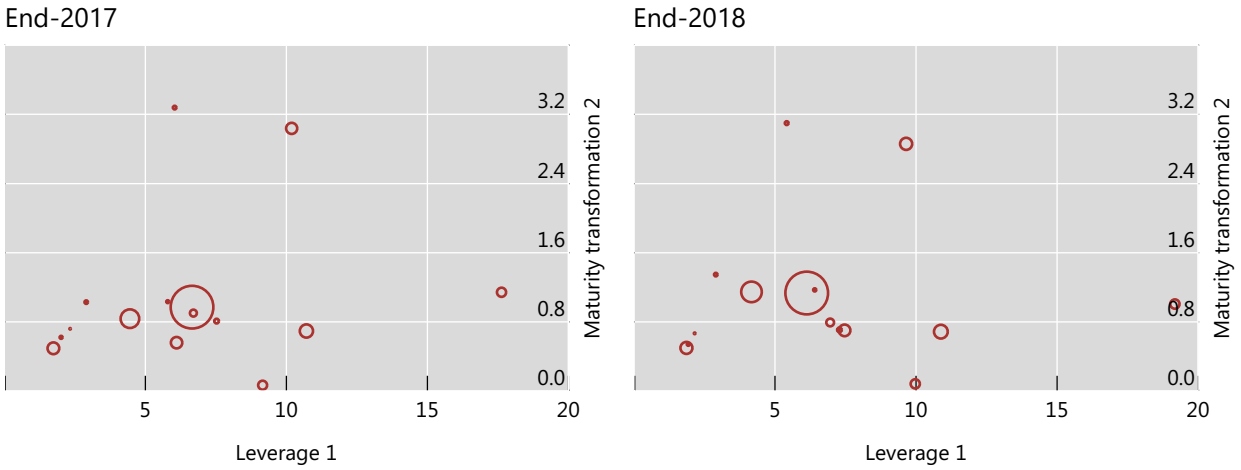
The median value for MT1 (the ratio of long-term assets funded by short-term liabilities) in 2018 remained similar to the median in 2017 (-0.10), indicating most finance companies do not engage in maturity transformation. The median value for MT2 (the ratio of short-term liabilities to short-term assets) decreased to 0.75 in 2018 from 0.82 in 2017, reflecting reductions in six jurisdictions. In contrast, MT2 increased in some of the jurisdictions with the largest EF2 assets. MT2 varied significantly across jurisdictions, showing a greater dispersion than other maturity transformation metrics.

### *(iii) Leverage*

The median leverage ratio, measuring the ratio of total financial assets to equity (L1) for finance companies was largely unchanged at around 6.8 in 2018, indicating a moderate amount of leverage. However, the higher median of the L2 ratio (ratio of total financial assets and total off-balance sheet exposures to equity) of 11.1 indicates that finance companies are likely taking on leverage through off-balance sheet exposures (or synthetic leverage).[93] Moreover, there was significant variance in the degree of leverage across jurisdictions, with L1 ranging from 1.8 to 19.2, and L2 ranging from 3.0 to 66.3. Jurisdictions that displayed higher levels of maturity transformation tended to also have higher levels of leverage (Exhibit 4-20).

[93] The 2019 monitoring exercise again showed that collecting off-balance sheet data for finance companies is challenging.

Finance Companies - Maturity transformation (MT2) vs leverage vs size[1] Exhibit 4-21




[1] Size of bubble denotes the sector's absolute size. Only jurisdictions which provided data for both the Leverage 1 metric and the Maturity Transformation 2 metric appear in this chart.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(iv) Liquidity transformation*

The median values for LT1 (the ratio of less-liquid assets funded by short-term liabilities, using a narrow definition of liquid assets) and LT2 (the ratio of less-liquid assets funded by short-term liabilities, using a broad definition of liquid assets) were slightly below 1 (0.99 and 0.94, respectively) across the nine jurisdictions that provided these metrics (Exhibit 4-20, RHS). These values indicate that short-term liabilities are roughly equivalent to liquid assets for these jurisdictions (ie there is no evidence that liquidity transformation is taking place). While the median LT3 value (the ratio of less than 30-days liabilities to liquid assets, using a broad definition of liquid assets) was low (0.69), one jurisdiction reported an extreme value of 5, which indicates that finance companies in this jurisdiction may be vulnerable to liquidity shocks during times of market stress.

### *(v) Short-term funding and liability structure*

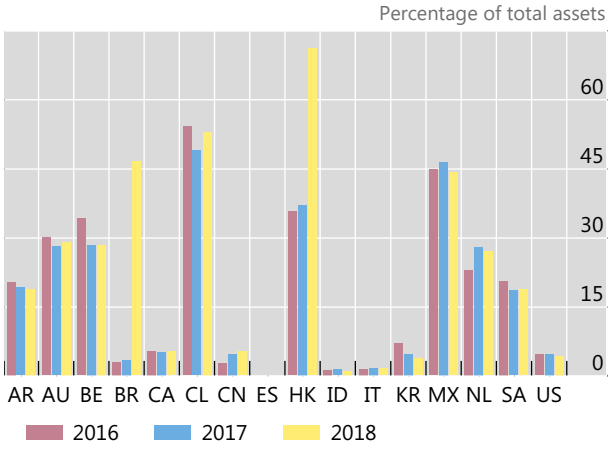
The use of short-term wholesale funding by finance companies in 2018 decreased relative to total assets in more than half of the jurisdictions that provided such data (Exhibit 4-22, LHS).[94] Short-term wholesale funding as percentage of total assets averaged 11.9%, but was over 30% in four jurisdictions (Brazil, Chile, Hong Kong and Mexico).[95]

[94] The exception in the case of Hong Kong is mainly due to changes in the data sample over time, making the 2017 and 2018 figures not directly comparable.

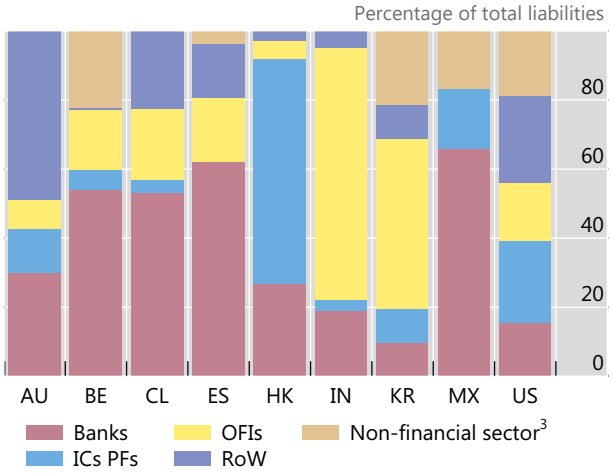
[95] In the case of Brazil, the substantial increase of short-term funding of finance companies as a per cent of total assets is related to a new regulation issued by Banco Central do Brasil (BCB) in 2016. Bonds issued by leasing companies were used by related banks as collateral for repurchase agreements. At that time, the BCB prohibited new transactions in order to mitigate the possibility of operations in which the value of the collateral has a high correlation with the credit risk of the counterparty receiving liquidity. As these operations were relevant to leasing companies, their financial assets declined and funding has shortened.

Finance company short-term funding and liability structure Exhibit 4-22

Short-term funding of finance companies[1]




Finance company liabilities to other entity types[2]




Note: The left panel only includes jurisdictions that provided short-term wholesale funding data for all three years; the right panel only includes jurisdictions that provided a breakdown of finance company interconnectedness data.

[1] For some jurisdictions, these high levels of funding from banks may be due to a large share of finance company liabilities reflecting funding in the form of intra-group loans from related (parent) banks as these finance companies are a part of wider banking groups (these entities are excluded from the narrow measure). [2] Claims on finance companies from other sectors. [3] Data on claims from the non-financial sector (non-financial corporations, government and households) were collected in the 2019 monitoring exercise for the first time on best-effort basis. Therefore, claims from this sector are not presented for some jurisdictions in the panel.

Source: Historical data included in Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Finance company liability structures differ across jurisdictions. As such, the interconnectedness between finance companies and the rest of the financial system, and associated risks, are quite varied across jurisdictions (Exhibit 4-22, RHS). Banks were the largest single source of finance company liabilities in Mexico (66% of total finance company liabilities), Spain (62%), Belgium (54%) and Chile (53%), while OFIs were the largest source in India (73%). For some of those jurisdictions (for example, Spain), high levels of funding from banks are due to intra-group funding from related (parent) banks, as these finance companies are a part of wider banking groups (such entities are excluded from the narrow measure). The rest of the world represented a relatively important source of funding for Australia, Chile and the US.

## 4.6. Economic Function 3

EF3 involves the intermediation of market activities that is dependent on short-term funding, including secured funding of client assets and securities borrowing and lending.

EF3 entities such as broker-dealers fulfil several important functions, including providing short-term credit to their clients in covering their positions, supplying liquidity through market-making activities, facilitating trading activities, providing investment advice to clients, publishing investment research and helping raise capital for corporates.[96]

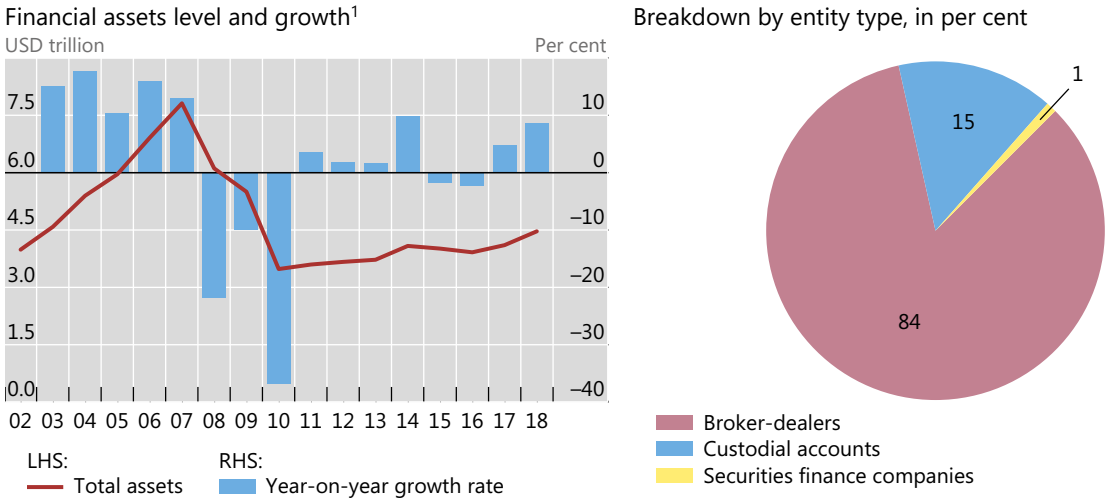
[96] EF3 entities' intermediation activity may also include securities brokerage services (ie buying and selling of securities and derivatives on- and off-exchanges including in a market-making role) as well as prime brokerage services to hedge funds.

### *4.6.1 Trends in Economic Function 3*

Of the 29 participating jurisdictions, 26 classified entities into EF3. In 2018, the vast majority of EF3 assets continued to be located in a few jurisdictions, with five jurisdictions accounting for almost 90% of total EF3 assets (China, Japan, Korea, the UK and the US). Three jurisdictions (China, Japan and the US) accounted for more than 75% of the total growth over the year.

Economic Function 3 trends and composition

*29-Group* Exhibit 4-23




[1] Changes in EF3 assets may also reflect improvements in the availability of data over time at a jurisdictional level. Net of prudential consolidation into banking groups where data are available. The post-crisis decline in EF3 assets seen in the left panel above was to some extent due to changes in the regulatory status of some large broker-dealers, which converted to bank holding companies or others that were consolidated into banking groups with regulatory/supervisory changes.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Broker-dealers[97] makes up 84% of total EF3 assets, with other EF3 entity types including custodial accounts (15%) and securities finance companies (1%). Where data permits, broker-dealer assets included into EF3 are net of prudential consolidation into banking groups, which represents a subset of the broader category of broker-dealers that is discussed in the macro-mapping section.

In 2018, EF3 assets grew by 8.7% to $4.5 trillion, representing 8.8% of the narrow measure (Exhibit 4-23). EF3 assets increased in 16 out of the 26 jurisdictions that classified entities into EF3 with the highest growth rates recorded in Brazil (95%),[98] Argentina (72%),[99] India (71%) and Ireland (51%). Growth of EF3 assets in EMEs (31%) outpaced that of AEs (7%), primarily driven by China. EF3 assets in 2018 declined in nine out of 26 jurisdictions in 2018, with the largest declines observed in the Cayman Islands (41%) and in Luxembourg (35%).

[97] Broker-dealers and entities with similar structures, such as securities companies and money market broker-dealers.

[98] This increase is mainly due to a single institution that has been expanding its activities. However, this market is very small in Brazil.

[99] This significant nominal change is mostly related to high inflation rates in Argentina.

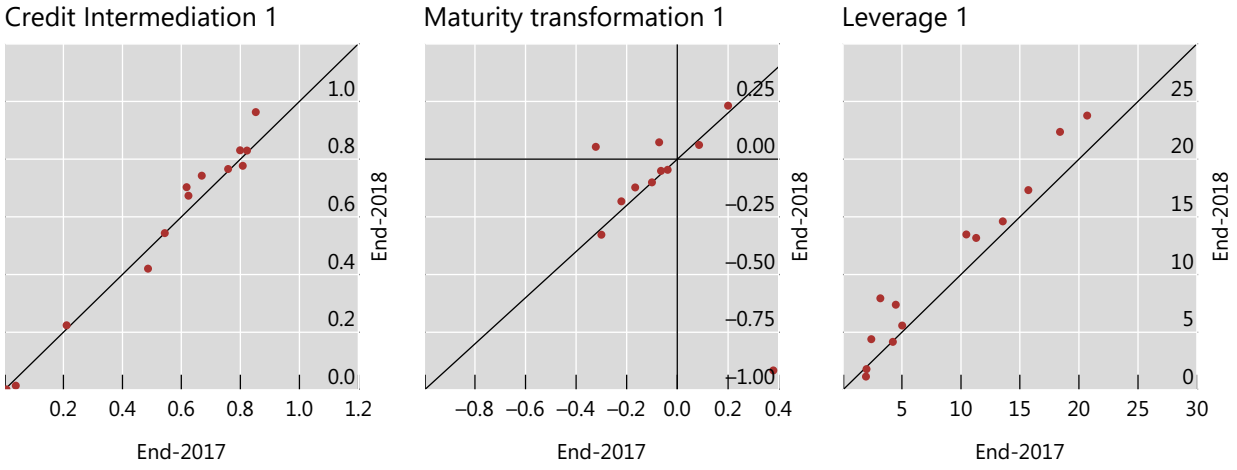
### *4.6.2 Financial stability risk metrics for EF3*

This section focuses on the risk metrics for broker-dealers,[100] given that these are the predominant EF3 entity type. Broker-dealers with significant degrees of leverage and maturity/liquidity transformation could: (i) amplify or cause runs if general market and/or asset price conditions deteriorate; and (ii) become subject to viability concerns if funding providers become concerned over the price deterioration of collateral supporting short-term borrowing.[101] Depending on these entities' funding models, these activities may involve liquidity risks, including intra-day liquidity risk. These entities may also be vulnerable to roll-over risk or runs by lenders if they are leveraged, particularly if their funding is primarily dependent on wholesale funding (eg repos).

The risk metrics for broker-dealers in 2018 were, overall, similar to those in 2017 (Exhibit 4-24), with the exception of the leverage measure which increased in almost all reporting jurisdictions and continues to be above the median value in six jurisdictions. In some cases, credit intermediation and maturity transformation metrics increased slightly in 2018. Repo liabilities increased as a share of total liabilities for all jurisdictions that reported both data points.

Broker-dealers

End-2018 versus end-2017 Exhibit 4-24




Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

#### *(i) Credit intermediation*

The median CI1 value (the ratio of credit assets to total financial assets) for broker-dealers was 0.70 in 2018, slightly higher than in the previous two years, while the median CI2 value (the ratio of loans to total financial assets)[102] was 0.13 in 2017 and 0.17 in 2018.[103] Three

[100] In some cases, differences in the risk metrics across jurisdictions might be caused by differences in whether prudentially consolidated broker-dealers are included in the data inputs or not. This may also result in differences as compared to the narrow measure of EF3, which only considers non-prudentially consolidated broker-dealers. The FSB continues to work on further improvements in risk metrics and their analysis.

[101] In some jurisdictions (eg the US), the risks of broker-dealers are generally mitigated by the fact that the transactions are secured with liquid securities as collateral (ie securities that have a ready market) and the balance sheet of the broker-dealer is comprised almost exclusively of cash and liquid securities.

[102] Excluding reverse repos (or repo assets).

[103] Jurisdictions reporting total assets instead of financial assets may have biased these two risk metrics downwards.

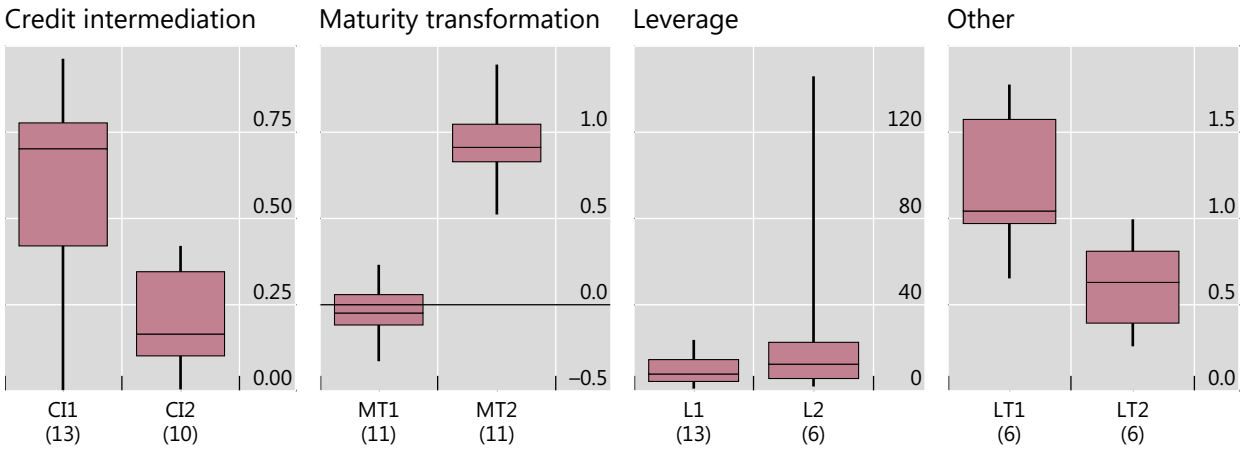
jurisdictions have CI1 metrics above 0.80, and three jurisdictions reported CI2 metrics around 0.40, indicating that most broker-dealers' credit intermediation activities are largely through debt securities and reverse repos, with only a fraction involving direct lending.

### *(ii) Maturity transformation*

Maturity transformation is not a major activity of most broker-dealers with more than half of the reporting jurisdictions reporting negative MT1 ratios (the ratio of long-term assets funded by short-term liabilities). This indicates that long-term liabilities could be financing both long-term credit and non-credit assets (eg equities). The median MT2 value (the ratio of short-term liabilities to short-term assets) was 0.91 in 2018, compared to 0.86 in 2017, indicating negative maturity transformation in general with the exceptions of three jurisdictions.

Risk metrics for broker-dealers

At end-2018 Exhibit 4-25




The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample.

See Box 4.1 for risk metrics definitions.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

### *(iii) Liquidity transformation*

The median LT1 value (the ratio of less-liquid assets funded by short-term liabilities, using a narrow definition of liquid assets) remained low and relatively unchanged between 2017 and 2018 (at 1.04 in 2018, compared to 1.00 in 2017), while the median LT2 value (the ratio of less-liquid assets funded by short term liabilities, using a broad definition of liquid assets) increased to 0.63 from 0.58. Together, these metrics imply that short-term liabilities broadly equalled liquid assets under the narrow definition, and short-term liabilities included far more than liquid assets under the broad definition. The LT1 for two jurisdictions, however, were above 1.7, indicating significant liquidity transformation in these jurisdictions.

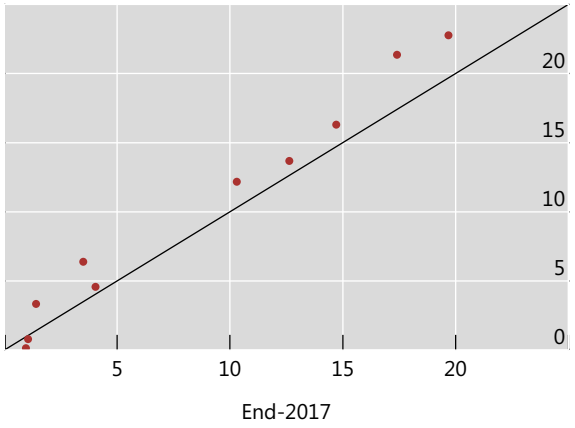
### *(iv) Leverage, debt-to-equity ratios and repo market activity*

The median value of L1 (the ratio of total financial assets to equity capital) was 7.9 in 2018, increasing from 7.7 in 2017, with three jurisdictions reporting L1 above 15. At the same

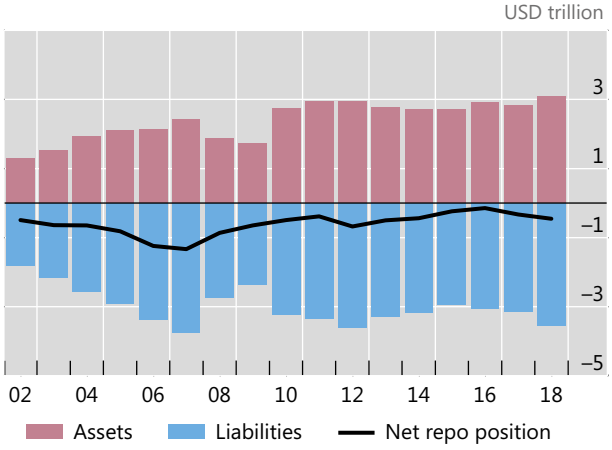
time, the debt-to-equity ratio increased moderately in almost all jurisdictions. The median debt-to-equity ratio was 9.3 in 2018, compared to 7.2 in 2017 (Exhibit 4-26). Meanwhile, the median L2 value (the ratio of total financial assets and total off-balance sheet exposures to equity)[104] increased to 12.5 in 2018 from 10.4 in 2017 with two jurisdictions having L2 well above the median. Together, the increases in these metrics indicate that broker-dealers continue to use balance sheet leverage, and also imply that some take on further leverage through off-balance sheet exposures. The longer time-series of risk metrics (where data are available) shows that while leverage in the system did increase moderately, overall systemic leverage remains below pre-crisis levels because of significant post-crisis deleveraging in one large jurisdiction. The relationship between leverage and maturity transformation was broadly unchanged.

Debt-to-equity ratios and repo market activity of broker-dealers — Exhibit 4-26

Debt-to-equity ratios[1]




Broker-dealers repo assets and liabilities[2]




[1] For AR, CA, FR, HK, IN, JP, KR, MX, RU, SG and the US. [2] For AU, BR, CL, ES, FR, ID, JP, KR, MX, SG, UK and the US.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

Broker-dealers are active in repo markets. While jurisdictions reported an increase in both aggregated repo assets and liabilities, the growth in repo liabilities was higher than that of assets (Exhibit 4-26, RHS). This resulted in a slight further decline in broker-dealers' net repo position (repo assets minus repo liabilities), indicating that broker-dealers continued to be somewhat greater net recipients of funding from repo markets in 2018.[105] This behaviour follows the break in trend already seen in 2017 compared to the 2012-16 period, where broker-dealers had obtained steadily less funding from repo markets.

## 4.7. Economic Function 4

EF4 comprises entities that insure or guarantee financial products by writing insurance on structured securities, effectively providing credit enhancements to loans (eg guarantees or credit derivatives) made by banks as well as non-bank financial firms. For example, financial

[104] The sample size for this metric is less than half of that for L1. This metric may overstate risks associated with leverage as it includes total off-balance sheet positions, without accounting for hedging or netting.

[105] While 13 jurisdictions provided data on broker-dealers' repo assets and liabilities and only seven provided risk metrics data, reporting has improved in general. In most of the 13 jurisdictions that provided this data, broker-dealers were net recipients of funding, except in Brazil, Indonesia, Spain and the UK.

guarantors or monoline insurers extend guarantees to bank and non-bank financial firms, using off-balance sheet commitments and derivatives.

By doing so, EF4 entities may facilitate credit creation by attracting lenders interested in increasing the probability of full repayment, even if the borrower cannot meet their obligations. The pricing of insurance protection should in principle reflect the creditworthiness of both the borrower and guarantor, but asymmetric information or other market frictions can cause imperfect credit risk transfer. If credit, liquidity or counterparty risks are mispriced, or incentives are misaligned, EF4 entities may help create excessive risk-taking, potentially contributing to boom-bust cycles.[106] [107]

The analysis here relies on credit insurers' balance sheets, which are often modest (given the nature of their business). As a result, EF4's impact and importance may be significantly understated due to the difficulty of adequately capturing off-balance sheet exposures. In addition, risk metrics for EF4 are not published due to the difficulty in interpreting the relatively sparse risk data provided by jurisdictions.[108]

### *4.7.1 Trends in Economic Function 4*

In 2018, EF4 assets grew by 5.0% to $329.6 billion, but still represented the smallest share of the narrow measure (0.6%) (Exhibit 4-27).[109] While overall EF4 assets grew in 2018, assets declined in 10 of the 19 jurisdictions that classified entities into EF4, with the US showing the largest nominal decline ($3 billion or 7.1%). The growth in EF4 over the past two years was mainly driven by the reclassification by Ireland of investment funds from EF1 to EF4 due to an increased use of credit derivatives (credit default swaps).[110] That trend has also impacted the composition of EF4, with investment funds accounting for half of total EF4 assets in 2018. Insurance corporations, financial guarantors and mortgage insurers together accounted for 35% of total EF4 assets.

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[106] See FSB (2013).

[107] Indeed, credit facilitators played a significant role during the period leading up to the global financial crisis. For example, by enhancing the credit quality of subprime mortgages or tranches of mortgage-backed securitisation (eg collateralised debt obligations (CDOs)), they facilitated credit and thus contributed to the build-up of excessive leverage in the financial system.

[108] Argentina, Canada, Chile, France, India, Korea, and the UK provided enough data to calculate at least one risk metric. Jurisdictions do not need to report risk metrics if an entity type's aggregate size is below 1% of their jurisdiction's total financial assets.

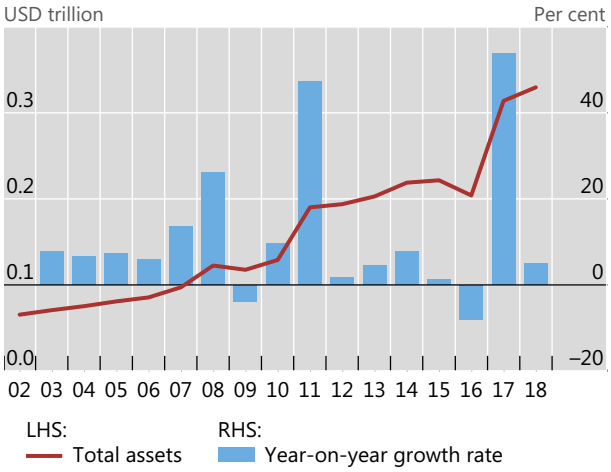
[109] Some jurisdictions have revised their historical data to provide a more accurate picture of changes in different OFIs assets net of prudential consolidation. Due to data source limitations, it is challenging to obtain assets net of prudential consolidation before 2009 but some jurisdictions (eg. FR for EF4 and UK for EF5) have made an effort in the 2019 monitoring exercise to extend back their time series which has impacted historical trends. In particular, the reclassification of some investment funds by Ireland from EF1 to EF4 has also substantially changed the broad aggregates for EF4 assets for 2017.

[110] Investment funds holding credit derivatives in excess of 5% of total assets are classified in EF4. A number of investment funds in Ireland passed this threshold during 2017 and they have been reclassified from EF1 to EF4.

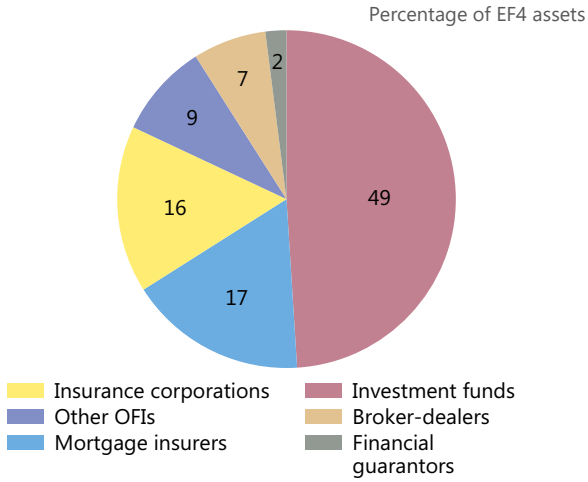
Economic Function 4 trends and composition

*29-Group* Exhibit 4-27

Financial assets level and growth[1]




Breakdown by entity type[2]




[1] Net of prudential consolidation into banking groups. Changes in EF4 assets may also reflect improvements in the availability of data over time at a jurisdictional level, see also footnote 109 for details on revisions of historical data. [2] At end-2018. SFVs and SPVs are among the entities included in "Other OFIs".

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

### *4.7.2 Financial stability risk metrics for EF4*

Due to the small size of EF4 assets, the relatively sparse risk data provided by jurisdictions (jurisdictions do not need to report risk metrics if an entity type's aggregate size is below 1% of their jurisdiction's total financial assets)[111] and the unique nature of EF4, it is currently difficult to interpret the risk metrics of EF4.

## 4.8. Economic Function 5

EF5 includes entities that are involved in securitisation-based credit intermediation (such as CLOs) or funding of financial entities through investment funds (or other similar structures, such as trust companies) to finance illiquid assets by raising funds from markets. Both bank and non-bank financial intermediaries use securitisation for funding (with or without the transfer of assets and risks from the securitisation entities), to improve their lending portfolios and for capital management. By facilitating the transfer of credit risk off-balance sheet, securitisation reduces funding costs for both bank and non-bank financial entities, and facilitates the availability of credit to the real economy. Nonetheless, securitisation could contribute to a build-up of excessive credit, maturity/liquidity transformation, leverage, or regulatory arbitrage in the system. This may be a greater risk in financial systems with relatively weak lending standards. The securitisation market is also sensitive to sudden reductions in market liquidity, particularly in the case of complex or opaque securitisations.

[111] Argentina, Canada, Chile, France, India, Korea and the UK provided enough data to calculate at least one risk metric.

### *4.8.1 Trends in Economic Function 5*

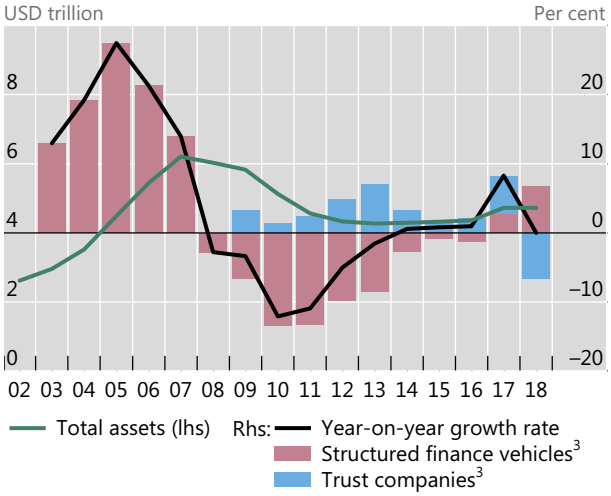
EF5 assets remained unchanged in terms of nominal value at $4.7 trillion at end-2018 and amounted to 9.3% of the narrow measure (Exhibit 4-28). A decrease in assets primarily driven by Chinese trust companies (which declined by 21.7%) was offset by the growth in SFVs[112] (9.7%). The growth in SFVs was a common trend in most jurisdictions (including China). Nonetheless, as in previous years, trust companies still account for a significant share of total EF5 assets in 2018, reflecting the strong growth seen during the previous eight years.

The decline in the assets of Chinese single trusts (which mostly serve as funding vehicles for financial institutions) was driven by a new policy that was issued by the China Banking Regulatory Commission in November 2017 to regulate banks and trusts corporations, requiring that trust companies do not provide financial institutions with a conduit service for the purpose of avoiding regulations such as investment or leverage constraints.[113] Meanwhile, the China Banking and Insurance Regulatory Commission strengthened the monitoring of conduit trusts and took enforcement action against violations.

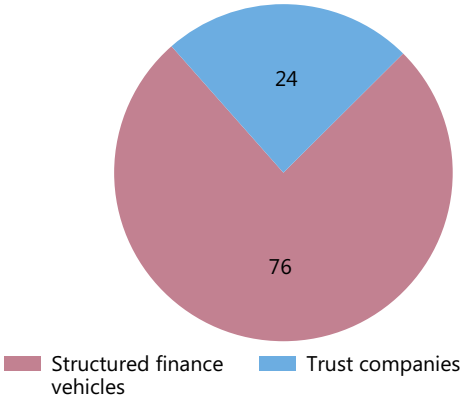
Economic Function 5 trends and composition

*29-Group* Exhibit 4-28

Financial assets growth[1,2]




Breakdown by entity type, in per cent[2]




[1] Changes in EF5 assets may also reflect improvements in the availability of data over time at the jurisdiction level, see also footnote 109 for details on revisions of historical data. Net of prudential consolidation into banking groups [2] At end-2018. Mortgage REITs and funds are primarily classified in EF1, but jurisdictions may also classify mortgages REITs and funds into EF5 if they also meet the criteria for this economic function. EF5 includes other entity types such as synthetic ETFs that are immaterial. [3] Contribution to growth.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

[112] In this section, the term "SFVs" is used to refer to a subset of the entire universe of SFVs included in the macro-mapping section. The difference in size ($5.0 trillion in macro-mapping compared to $3.6 trillion in EF5) and growth (5.7% in macro-mapping compared to 9.7% in EF5) relates to the exclusion of prudentially consolidated entities from EF5 and the fact that some SFVs are instead classified in EF4 or outside the narrow measure.

[113] The mentioned policy issued in 2017 was followed by a series of guidelines for regulating the asset management businesses of financial institutions that were released jointly by the People's Bank of China, China Banking and Insurance Regulatory Commission, China Securities Regulatory Commission, and the State Administration of Foreign Exchange in April 2018.

SFVs, which represent the largest share of EF5 assets (76%), continue the upward trend seen since 2017. This increase reflects growth in 16 of 25 jurisdictions reporting SFVs, but was driven mainly by some countries in the euro area (namely France, Ireland, Italy and Luxembourg) and the Cayman Islands. The Cayman Islands, India and Italy experienced the highest growth rates, increasing by 44.2%, 35.7% and 29.7% respectively. Nonetheless, some large markets such as the US continued to see declines in SFV assets.

The drivers of the growth in SFVs assets vary across jurisdictions. In the Cayman Islands, the stock exchange CSX has increased marketing initiatives of "specialist debt", one of the largest shares of new listings during 2018. This includes CLOs, aircraft asset-backed securities deals and synthetic securitisations. In France, the rise in outstanding amounts can be partly attributed to preparations by new and existing entities ahead of the new framework for European securitisations that took effect in January 2019.[114] In Ireland, smaller securitisation vehicles sponsored by non-banks have replaced traditional large mortgage pool vehicles linked to banks or resolution entities. Part of the increase in Ireland is also explained by assets of Irish CLOs having grown significantly during the period.[115] In Italy, a new law on public guarantees, operating since June 2016, has helped revitalise the Italian SFV market, which has had a renewed appeal for banks seeking to sell off non-performing loans. Similarly, in India, the growth in assets of SFVs was largely driven by the acquisition of non-performing assets from banks.

### *4.8.2. Financial stability risk metrics for EF5*

SFVs account for 76% of EF5 assets, and thus the analysis in this section focuses on SFVs and their risk metrics. Risk metrics for SFVs remained relatively unchanged between 2017 and 2018 and continue to show a significant degree of credit intermediation. However, in 2018 there was a higher degree of leverage.[116]

#### *(i) Credit intermediation*

SFVs classified into EF5 continue to engage in a significant degree of credit intermediation. The median value for CI1 (the ratio of credit assets to total financial assets) remained at 0.91 in 2018 (with some variation across jurisdictions), while the median value for CI2 (the ratio of loans on the asset side of the balance sheet to total financial assets) increased slightly from 0.71 in 2017 to 0.73 in 2018. The high values for CI2 indicate that SFVs intermediate more loans than bonds.

#### *(ii) Maturity transformation*

The SFVs in 10 of 12 jurisdictions displayed low levels of maturity transformation while the SFVs of the remaining two jurisdictions displayed substantial maturity transformation (greater than 0.5 for MT1 and greater than 5 for MT2). Maturity transformation of SFVs in one large jurisdiction declined significantly from an MT2 of over seven in 2006 to under

[114] This framework introduced rules for issuing simple, transparent and standardised securitisation transactions.

[115] For more details on the Irish CLO market, see McCarthy et al. (2019) 'The Who's Who of Irish Collateralised Loan Obligations', *Central Bank of Ireland Behind the Data Series.* November 2019.

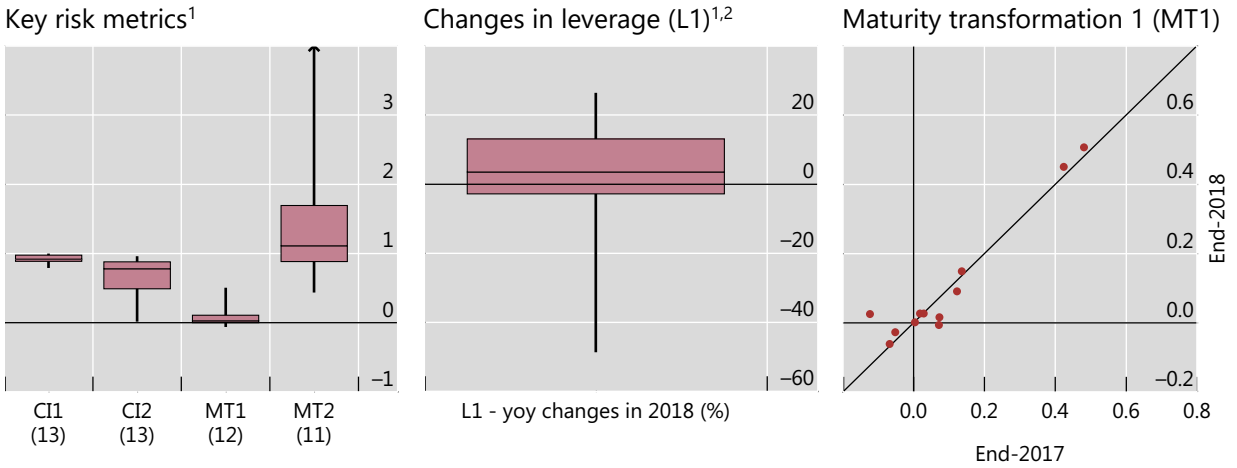
[116] Measured as the ratio of total financial assets to the equity tranches.

two since 2010,[117] while SFV assets declined overall between 2008 and 2016 (Exhibit 4-28 LHS red bar). Over the past two years, SFV growth has recovered, but maturity transformation has not increased significantly (Exhibit 4-29 RHS).

### *(iii) Leverage*

Although SFVs' leverage (L1 - the ratio of total financial assets to the equity tranches) has been considerably lower than before the global financial crisis, there are some indications of increasing leverage ratios in some jurisdictions.

Risk metrics for structured finance vehicles — Exhibit 4-29




[1] The median value is represented by a horizontal line, with 50% of the values falling in the 25th to 75th percentile range shown by the box. The upper and lower end points of the thin vertical lines show the range of the entire sample. In some cases, arrows at the top of the vertical line indicate jurisdictions with ratios outside the range shown in the graph. The numbers in parenthesis indicates the number of jurisdictions that reported such risk metrics. [2] Year-over-year changes in 2018 for the ten jurisdictions that reported such risk metrics.

See Box 4.1 for risk metrics definitions. Each jurisdiction's data submission reflects data from many individual entities within that jurisdiction. Some risk metrics included data from entities prudentially consolidated into banking groups, as some jurisdictions' granular data do not distinguish between consolidated and non-consolidated entities.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

[117] The 2019 monitoring exercise was the first year that an extended time series for risk metrics was collected. It was done on a best efforts basis.

# 5. Case studies

## 5.1 Distinguishing between flow and valuation effects in the investment fund sector[118]

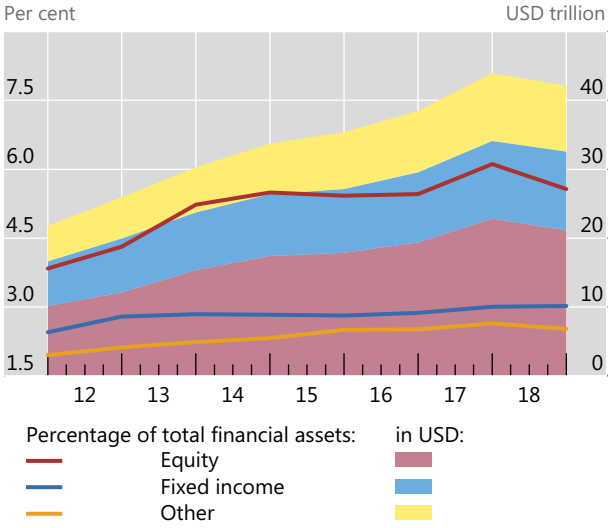
Since the global financial crisis through 2017, non-bank financial intermediation and, in particular, Other Financial Intermediaries' (OFIs) assets grew faster than banks' assets. Between 2012 and 2017, global OFI assets also grew faster than those in the total financial system (Exhibit 2-1). However, OFI assets declined in 2018. As explained in Section 2, investment funds are the largest OFI sub-sector and have been the primary driver of its growth in recent years. Against this background, this case study focuses on the expansion of the global investment fund sector and the main drivers of its growth. In particular, this case study assesses to what extent flow or valuation effects account for the sector's longer-term expansion and whether the decline in total assets towards the end of 2018 was due to a drop in valuations or to outflows. The fact that investment fund assets are usually marked-to-market can lead to higher volatility and growth in total assets, eg compared to bank assets.

Exhibit 5-1 (LHS) shows the evolution of global funds' total assets for the *21 + EA-Group* since 2012, while Exhibit 5-1 (RHS) shows the main drivers of that growth for the euro area, Japan, the UK and the US during that period.

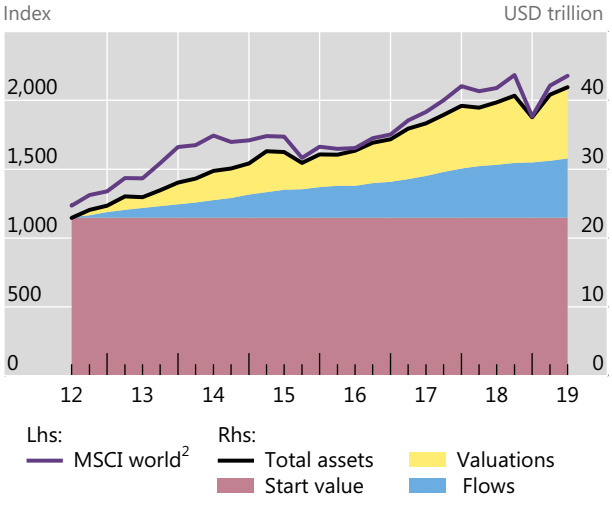
Investment fund growth

Exhibit 5-1

Other investment funds (OIFs)[1], *21+EA Group*




Total investment funds for EA, JP, UK and US




[1] OIFs = Other investment funds ie investment funds excluding hedge funds and MMFs. [2] The MSCI World Index is a broad global equity index that represents large and mid-cap equity performance across all 23 advanced economies.

Sources: Bank of Japan Flow of Funds accounts; ECB Investment Fund Statistics and ECB calculations; UK Office for National Statistics; US Financial Accounts and US Federal Reserve Board calculations; Datastream; FSB.

[118] This case study was prepared by Grace Brang (FRB), Katharina Cera (ECB), Steven Dodkins (BoE), Carlo Gola (Bank of Italy), Esti Kemp (FSB Secretariat), Jose Alonso Olmedo (Bank of Spain), David Rappoport (FRB), Yasushi Shiina (FSB Secretariat), Alexandros Vardoulakis (FRB), Christian Weistroffer (ECB), and Shane Worner (IOSCO).

The investment funds sub-sector analysed in this case study comprises mainly equity funds, fixed income funds and mixed funds, and excludes hedge funds and MMFs. This sub-sector is referred to as Other Investment Funds (OIFs) in this Report. Exhibit 5-1 (LHS) shows that for the *21+EA-Group* sample, OIF assets have increased significantly since 2012. Total financial assets of OIFs grew at an average annual rate of 11% between 2012 and 2017. Despite the decline experienced in late 2018, OIF assets reached $42.1 trillion in 2018. While equity funds remain the biggest fund category, all the main categories (equity, fixed income and mixed funds) have contributed to this growth in absolute terms.

Several factors may have contributed to the growth of this sector, by affecting either asset valuations or flows, or both. For example, the expansion of the global economy since 2010 and accommodative monetary policy may have contributed to rising asset prices, while at the same time, expectations for higher growth and corporate profits may have attracted net inflows into equity funds. This case study tries to disentangle trends in flow and valuation effects, but it will not assess how the underlying factors may have weighed differently on flows and valuations.

Exhibit 5-1 (RHS) shows to what extent total growth can be attributed to growth from flows and growth from valuations for investment funds in the euro area, Japan, the UK and the US, which together account for 80% of the global OIF sector in 2018. Our sample starts in 2012 due to data availability issues prior to this date. Exhibit 5-1 (RHS) shows that both flows and valuations have contributed similarly to total growth over this time period. However, while the increasing trend for flows is relatively steady and smoother, the time series for valuation effects shows more volatility. In particular, the decline in OIFs' assets at the end of 2018 was due to valuation effects rather than a slowdown in flows to the sector, while valuations partly recovered in the first half of 2019. Using financial accounts data (flow-of-funds), we devise a methodology for the decomposition of flow and valuation effects in the growth of investment fund assets. Such decomposition allows the tracking of developments over time, including by region and type of funds. It can be used to assess, for instance, to what extent the sector's expansion can be attributed to rising asset valuations and which parts of the sector have attracted net inflows.

Section 5.1.1 outlines the methodology we employ to disentangle the two sources of growth, while Section 5.1.2 applies the methodology to US and euro area data and discusses the results. Section 5.1.3 summarises the key takeaways.

### *5.1.1 Methodology*

The contribution of valuation effects to the growth of funds' assets is approximated as the residual from subtracting the cumulative flows from total assets. The cumulative flows are computed as the cumulative net changes in funds' shares. US data are taken from the Financial Accounts of the US (quarterly frequency), euro area data from the ECB's primary statistics for investment funds (IVF) (monthly frequency), Japan data from the Flow of Funds accounts (quarterly frequency), and UK data from the Office for National Statistics (quarterly frequency).

The computed series could be over- or understating the flow effects for countries which do not account explicitly for changes in leverage. The reason is that investment funds could increase (decrease) their total assets by leveraging up (deleveraging) or through derivatives

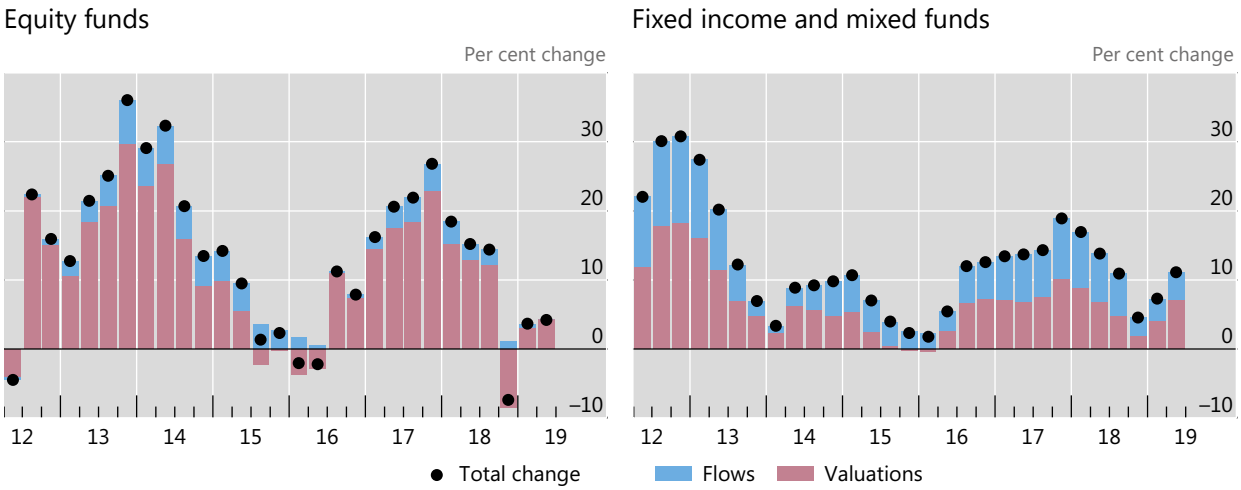
positions, which would be attributed to the flow effects under the current methodology. Unfortunately, we do not have data for the funds' leverage and derivatives positions with the exception of the euro area. However, these considerations should not introduce considerable biases in our computed series, because the changes in leverage are not extensive for most types of funds. Another caveat stems from the fact that valuation effects are calculated as a residual, which may in some cases be affected by sample problems due to the reclassification of some funds. With these caveats in mind, we examine in the next section how the flows and valuation effects move over time for the two largest regions in our sample.

### *5.1.2 Valuation effects across fund types and regions*

Exhibits 5-2 and 5-3 report the rolling yearly changes in funds' assets split into flow and valuation effects for the US and the euro area.[119] The split is informative because intuitively the relative importance of flow and valuation effects should differ across fund types. There are three high-level observations we can make from looking at these charts.

United States

Yearly percentage change (quarterly frequency) Exhibit 5-2




Notes: Flows are approximated by net transactions of "shares issued"; valuations are calculated as a residual by decomposing changes in total assets according to the following identity: $\Delta total\ assets = flows + adjustments + \Delta$valuations $(residual)$

Cumulative flows are computed as the cumulative changes in funds' shares, plus reinvested capital distributions.

Sources: US Financial Accounts and US Federal Reserve Board calculations.

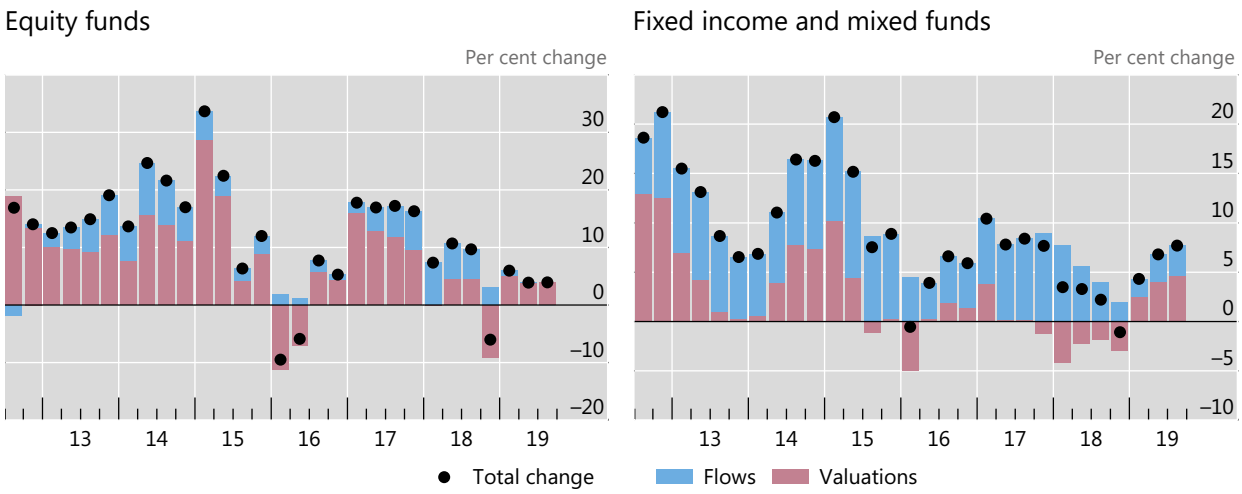
First, both flow and valuation effects contribute to the growth in OIFs, but the relative contribution differs across fund categories where effects can be studied by asset class. For equity funds both in the US and in the euro area, the growth as well as the volatility in total assets can be predominantly attributed to changes in valuations. The greater impact of valuation effects on equity funds is to be expected as equities are generally riskier assets than bonds, and valuation is more volatile. Valuation effects are smaller for fixed income and mixed funds than for equity funds, but still significant, which may be driven by the equity holdings of mixed funds. Valuation effects are roughly equal to flow effects for US

[119] A split of flow and valuation effects by asset class and fund type for Japan is available, though not for the UK. In the interest of space, we do not report the rolling yearly changes for these jurisdictions.

bond funds, whilst flow effects have played a more significant role in the growth in euro area fixed income and mixed funds.

Euro area

Yearly percentage change (quarterly frequency) Exhibit 5-3




Notes: Flows are approximated by net transactions of "shares issued"; valuations are calculated as a residual by decomposing changes in total assets according to the following identity:$\Delta total\ assets = flows + \Delta \text{borrowings} + adjustments\ for\ derivatives + \Delta \text{valuations}\ (residual)$

Sources: ECB Investment Fund Statistics and ECB calculations.

Second, net flows in equity, fixed income and mixed funds tend to be correlated with valuation gains, which in turn follow price developments in the underlying asset markets. Total asset growth in the bond/mixed fund sector has displayed some cyclicality over time, with recurring periods of gradually increasing inflows and rising valuations, followed by weaker inflows and declining valuations are observed. Such patterns are less pronounced for equity funds, where changes in flows and valuations tend to develop more abruptly over time, especially for the US. While bond/mixed funds in the euro area have cyclicality over time, they more recently reflect greater flow effects.

Third, the slowdown in growth of equity, fixed-income and mixed funds in the US and euro area at the end of 2018 has been followed by a recovery. The slowdown and subsequent recovery of equity funds was due almost entirely to changes in valuation, while the pattern for fixed income and mixed funds was a product of both valuation and flow effects.

### *5.1.3 Key takeaways*

Disentangling flow and valuation effects in OIFs is important to understand the contributors to growth. Overall, OIF growth from flows and valuations is evenly split in aggregate since 2012 in the four regions we cover (see Exhibit 5-1).

Valuation effects are the predominant contributor of equity fund growth in the US and euro area, and an equal contributor to bond and mixed fund growth in the US, but are less prominent for fixed income and mixed funds in the euro area. The reduction in OIFs' assets at the end of 2018 and subsequent recovery in equity funds in the US and euro area and in bond funds in the euro area was due to valuation effects rather than a slowdown in flows. Finally, valuation gains and net inflows are often positively correlated in the US and euro

area for equity funds and for bond and mixed funds in the US; noting the role of the monetary and macroeconomic environment deserves further attention in future work.

## 5.2. The role of non-bank financial institutions in providing financing to commercial real estate[120]

This case study focuses on the role of non-banks in providing financing to commercial real estate (CRE) and its potential financial stability implications. Given the importance of CRE markets in many countries, and the past experience of these markets causing financial instability and wider economic difficulties,[121] the growing role of non-bank financing in these markets warrants close monitoring and analysis. This case study has been informed by a recent survey of non-bank CRE financing across 17 jurisdictions.[122] Databases sourced from private companies (Real Capital Analytics (RCA) and Morgan Stanley Capital International (MSCI)) were also used. The case study focuses on the "professionally managed" CRE market, defined by MSCI as real estate assets held as investments for the purposes of delivering a mix of income and capital returns.[123]

### *5.2.1 CRE market and non-bank financing*

The global stock of CRE held for investment purposes has been estimated at almost $10 trillion by MSCI.[124] The total global stock of CRE, both professionally managed (also "invested") and non-invested, has been estimated to be $33 trillion in 2017. In contrast, it is estimated that the total global stock of residential real estate (RRE) is much larger, at $221 trillion in 2017.[125]

The most common type of non-banks with CRE exposures are real estate investment trusts (REITs) and real estate investment funds (REIFs). Of the 17 survey respondents, REITs and REIFs were reported by 12 jurisdictions. Insurance companies were reported by nine jurisdictions and pension funds by 10 jurisdictions, while only four jurisdictions reported finance companies as having CRE exposures. Exhibit 5-4 provides an overview of the type of non-banks with CRE exposures across the 17 survey respondents.

The type of CRE financing provided differs between the different types of non-banks. While there are differences among reporting jurisdictions, REITs typically invest in CRE property directly and the REITs are often held by retail investors while REIFs invest in CRE property both directly and indirectly (ie through shares and/or bonds of CRE companies) and the REIFs are mostly held by institutional (professional) investors. A number of jurisdictions also indicated that other investment funds beyond REIFs have CRE exposures (BE, HK, JP, MX and TR). REITs are usually publicly traded but one jurisdiction also mention private REITs (JP). Finance companies provide *debt* financing to CRE companies, in contrast to

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[120] This case study was prepared by Pierce Daly, Cian Murphy, Neill Killeen (CBoI); Claire Océane Chevallier, Stephanie Heck, Dimitra Michala (CSSF Luxembourg); Mustafa Yuksel (RBA); Barbara Jarmulska (ECB).

[121] See Ellis, L and C Naughtin (2010); ESRB (2015); and Sveriges Riksbank (2017).

[122] Any results and conclusions in this case study should be considered with the caveat that they are, to a large extent, based on only a limited survey of Experts Group-jurisdictions, which excluded a number of other Experts-Group jurisdictions, often with large CRE markets. Survey respondents are Australia (AU), Belgium (BE), Brazil (BR), Germany (DE), Hong Kong (HK), India (IN), Ireland (IE), Japan (JP), Luxembourg (LU), the Netherlands (NL), Mexico (MX), Russia (RU), Saudi Arabia (SA), Singapore (SG), South Africa (ZA), Spain (ES), and Turkey (TR).

[123] Real Estate Market Size 2018 report, MSCI. This is notwithstanding the fact that other, sometimes broader, definitions are preferred by some jurisdictions.

[124] Real Estate Market Size 2018 report, MSCI.

[125] See Savills (2018). The total estimate excludes local commercial properties, workshops, workspaces, shops and small business premises, since they were not able to be valued at a global level.

REITs, REIFs, insurance companies and pension funds, which are traditionally more active in CRE *equity* financing.

Stylised overview of CRE non-bank financing by survey respondents Exhibit 5-4

| Non-bank entity type | Jurisdictions in which present | Debt or equity financing | Investors/Creditors |
|---|---|---|---|
| REITs | AU, BE, ES, IE, JP, HK, MX, NL, SA, SG, TR and ZA | Equity (mostly physical property, shares possible) | Investors are banks, retail investors (ie households), non-financial companies, and other investment funds.<br>Leverage comes mainly from banks in the form of loans. |
| REIFs | AU, BR, DE, ES, IE, JP, LU, NL, RU, SA, TR and SG | Mostly equity (shares, physical property possible) | Investors are insurance companies, pension funds, investment funds, banks, high net-worth individuals, family trusts/offices and offshore investors. Sometimes retail investors.<br>Leverage comes mainly from banks in the form of loans. |
| Insurance corporations | BE, DE, HK, IE, JP, LU, MX, NL and ZA | Generally equity, debt financing possible | Retail investors/households, through premiums, mainly from life insurance contracts. |
| Pension funds | AU, BR, HK, IE, JP, MX, NL, RU, TR and ZA | Generally equity, debt financing possible | Retail investors/households, through compulsory and/or voluntary employer and employee contributions. |
| Finance companies | AU, HK, IN and SA | Mostly debt | Equity comes from shareholders' funds (composition information not available).<br>Debt comes from banks in the form of loans, intragroup loans. |
| Special purpose entities (SPEs) | IE | Entirely debt | Debt financing comes from noteholders of debt securities issuance, as well as in the form of loans from affiliated companies. |

Source: Survey of the Experts Group

While banks still tend to play an important role in CRE financing, data on the share of banks' versus non-banks' CRE exposures are generally not available.

### *5.2.2 Jurisdiction-specific evidence in methods of non-bank CRE financing*

Non-bank CRE exposures represent less than 3% of total financial assets[126] for nearly all of the 17 survey respondents. In Exhibit 5-5, the CRE non-bank exposures for the bulk of survey respondents as at end Q4 2018 are presented in absolute terms (LHS) and also as a share of financial assets and GDP (RHS). In the paragraphs that follow, specific details are provided for selected jurisdictions in which non-banks' CRE exposures are more relevant for their economy.

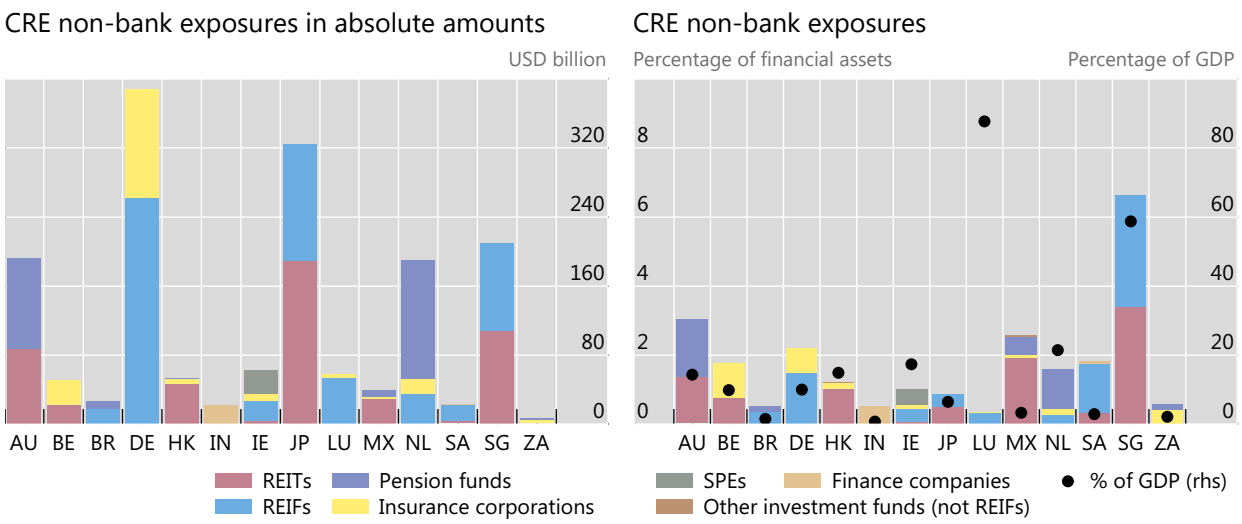
In **Australia**, non-banks with CRE exposures are REITs, REIFs, family trusts, pension funds, and finance companies. Data are available for REITs and pension (superannuation) funds. Exposures as at end Q4 2018 were AUD124.0 billion and AUD148.1 billion, respectively. REITs are typically listed and take equity ownership on a wide range of CRE assets,

[126] That is, total financial assets of all financial corporations (the sum of banking and non-banking financial assets).

particularly offices. REIFs and pension funds also hold equity stakes in CRE, but also have debt exposures. REIFs debt exposures have been typically in the form of mezzanine finance, but are increasingly including senior loans (mostly to developers).

In **Germany**, direct CRE exposures for REIFs represent around 70% of their total CRE exposures. Their total CRE exposures reached €228.7 billion as at end Q4 2018. For insurance companies, direct CRE exposures amount to €29.1 billion and indirect CRE exposures (debt and equity financing together) amount to €80.5 billion as at end Q4 2018.

CRE non-bank exposures per survey respondent (Q4 2018)[1] Exhibit 5-5




Notes: No data available for Russia, Spain and Turkey. These countries mostly submitted qualitative information. The graphs above may contain an element of double counting as, for example, REITs may include investments in pension funds or other entities that in turn have property exposures. The graphs above cover domestic and non-domestic exposures of both physical ownerships of CRE assets, as well as debt and equity financing of CRE. Several responding jurisdictions mentioned that figures reported above may be affected by data gaps.

[1] For Hong Kong, pension fund data refer to Q1 2019 and insurance companies data refer to Q4 2018. For Mexico data refer to Q2 2019. For Luxembourg, insurance sector data include both RRE and CRE exposures.

Source: Survey replies and authors' calculations.

In **Hong Kong**, pension funds mainly have an indirect exposure by financing CRE equity through REITs – this exposure amounts to HKD3.1 billion as at end Q1 2019 (77% of which is invested into domestic REITs, while the remainder is invested into overseas REITs). As at end Q4 2018, insurance companies have a total exposure amounting to HKD 52.2 billion, with immaterial indirect exposure. Meanwhile, Hong Kong REITs have a total net asset value of HKD364 billion.

In **Ireland**, REIFs and REITs mainly invest in domestic physical CRE assets, with total exposures of €20 billion and €3.6 billion, respectively, as at end Q4 2018. SPEs also invest in significant sums of CRE loans, primarily secured on domestic property, totalling €24 billion as at end Q4 2018. These are generally purchased from other originators. Exposures of insurance companies and pension funds to physical CRE collectively totalled €7.2 billion as at end Q4 2018.

In **Japan**, public REITs and private investment funds play important roles with total market exposures of ¥17.9 trillion and ¥14.8 trillion respectively, as at end Q4 2018. The exposure of private REITs was ¥2.9 trillion. Public and private REITs have been growing steadily since 2011, gaining market share from investment funds. These entities mostly have exposures in physical CRE property.

In **Luxembourg**, CRE REIFs account for €46.9 billion net assets as at end Q4 2018. Out of these, €44.5 billion provide a breakdown of their assets into different instruments, and around 68% of these assets is invested in physical CRE property. Investments in RRE and CRE by insurance companies reached €4.1 billion as at end Q4 2018. Out of these €4.1 billion, €2 billion is debt financing (bonds, CMBS, loans, mortgages), €1.8 billion is equity financing (shares and funds) and the remaining €0.3 billion is physical CRE.

In **the Netherlands**, non-banks with CRE exposures are insurance companies, pension funds, REIFs and REITs. Insurance companies and pension funds invest in CRE increasingly in an indirect way via funds. Dutch pension funds in particular are the main shareholders in Dutch REIFs and REITs. Exposures as at end Q4 2018 were €15 billion for insurance companies, €120 billion for pension funds and €30.6 billion for REIFs/REITs.

In **Singapore**, non-banks with CRE exposures are REITs and REIFs. CRE exposures amount to SGD147 billion for REITs and SGD139 billion for REIFs as at end Q4 2018. Out of the SGD 147 billion for REITs, SGD90 billion is CRE equity financing while SGD48 billion is CRE debt financing (loans and bonds).

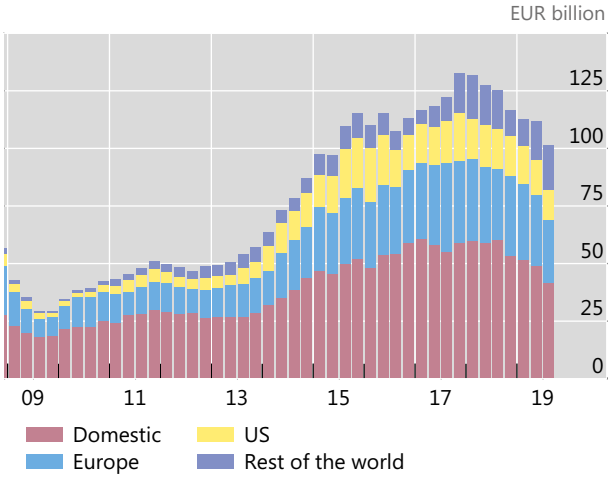
### *5.2.3. Cross-border financing of non-bank CRE exposures*

Data from RCA suggest that cross-border activity in CRE financing is increasing. In the euro area in particular, CRE markets have been recently characterised by strong transaction volumes, which increased especially from 2014 to 2017 (Exhibit 5-6, LHS). The increase in transaction volumes seems to be correlated with the increased activity of non-resident investors, including those from outside the euro area. The share of cross-border transactions has increased to over 55% from an average of 36% in 2009, when the recovery in transaction volumes started. Similarly, the share of investment from outside Europe has increased from 8% in 2009 to around 30% in mid-2019. US investors are a particularly relevant group of buyers in euro area CRE markets, though their share in foreign transactions fell from peak levels of 30% in 2017 to around 20% of foreign transactions in mid-2019. Investment funds are a main category of foreign investors in euro area countries (Exhibit 5-6, RHS).

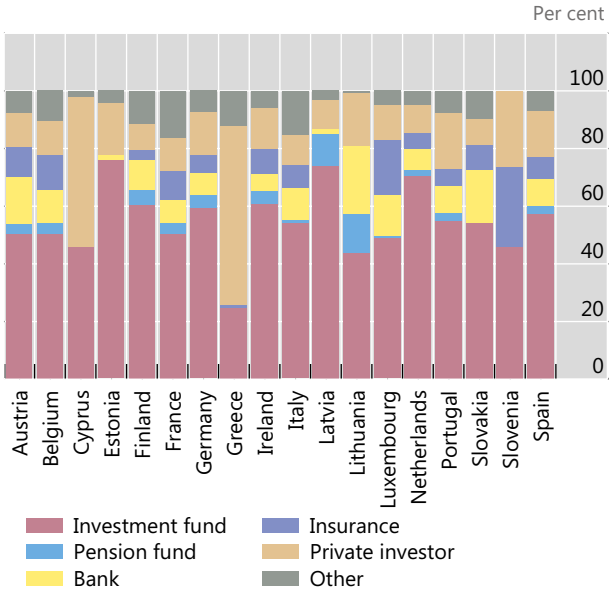
Some survey respondents also reported a large share of non-resident investment in CRE markets across regions. In certain cases, for example Australia and Spain, anecdotal evidence suggests foreign and non-bank investors may play an important role through direct investment in CRE, or indirectly through investment in REITs or REIFs. In Ireland, 60% of investors in REIFs are non-residents, mainly located in the EU. Similarly, foreign investment through REITs is also high. In Belgium, 64% of investment in REITs came from non-residents in 2018, mainly non-bank investors located in the US and Europe. Investors in Irish REITs are also generally located outside the euro area and represent 67% of the total. In Japan and Mexico roughly half of REIT investors are non-residents, at 52% and 54%, respectively. In contrast, non-resident investors represent only 1.5% of investors in REIFs in Brazil.

Direct acquisition of CRE property in the euro area Exhibit 5-6

Transaction volumes by origin




Foreign buyers' sectors per country, 2007-2019




Note : Investment Funds include the following categories provided by the RCA: Equity Fund, Investment Manager, Open-Ended Fund, Endowment, Non Traded REIT, REIT, REOC, Listed Funds and Sovereign Wealth Fund.

Sources: ECB calculations based on RCA.

### *5.2.4 Key takeaways*

The involvement of non-bank financial institutions in CRE financing may raise potential financial stability concerns. Although data gaps make it difficult to properly evaluate the level and evolution of such risks, the nature of the institutions involved may warrant attention in relevant jurisdictions. With respect to REITs and REIFs, it is important to evaluate the adequacy of liquidity management for open-ended funds and the use of leverage for closed-ended funds. Certain REITs and REIFs may engage in liquidity transformation, and if a sharp reversal in investor sentiment and/or market conditions led to investor withdrawals from those entities, it could potentially force them to sell underlying assets at depressed prices. This is less of an issue for publicly traded REITs where the fall in their share price would absorb negative market sentiment without an automatic pressure on the REIT to sell underlying assets. For REIFs, survey replies suggest that liquidity risk is limited given that funds are generally closed-ended (or similar to closed-ended funds) in their redemption conditions.[127] The entrance of non-traditional lenders such as insurance companies in the market may generate additional transmission channels of potential risk. Insurance companies may be vulnerable to price corrections and shifts in demand from commercial property tenants, thereby affecting anticipated future income flows. Finally, while growth in overseas investment may diversify risk, cross-border investment and funding may also increase the interdependence of global CRE markets and act as a channel of contagion during periods of market stress.

When it comes to mitigating regulation, survey replies suggest that usually there are no specific provisions applying to non-banks regarding their involvement in CRE markets,

[127] An exception is Turkey, where all REIFs are open-ended as there are no closed-ended funds in Turkey.

beyond the general regulatory framework.[128] This can reflect, in part, the view (eg in Belgium and Brazil) that the existing framework is sufficient/proportionate to the limited risks presented by non-bank CRE financing at this time. The general regulatory framework usually includes - for more typical non-bank intermediaries like finance companies - capital adequacy and governance requirements, while for funds, there are limits on borrowing, indebtedness, leverage and liquidity mismatch, along with redemption notification periods applicable to funds (such as through the EU's Alternative Investment Fund Managers Directive).

Overall, this case study suggests that the involvement of non-banks in CRE markets should be kept under regular review by the authorities. However, this requires that data gaps are addressed so that the risks posed by this activity can be effectively monitored. This case study found that authorities in some responding jurisdictions are often not in a position to identify CRE exposures of non-bank entities. They sometimes do not have enough information on the size, type and geographical distribution of CRE investment of their non-banks. They also usually lack data on the investors of these non-bank entities. Challenges also remain with respect to assessing the level of interconnectedness of these investors. The important presence of non-resident investors implies that cross-border linkages may also warrant closer attention by jurisdictions. Addressing data gaps in these and other areas would be important steps in boosting the monitoring of CRE financing.

[128] Only three respondents specified CRE-specific regulatory tools. In Germany, open-ended REIFs are subject to minimum holding periods and notification periods for fund share redemptions. In Hong Kong, the value of "land and buildings" (including physical CRE assets) must not exceed 30% of total eligible asset value of insurance companies carrying on general insurance business. In Mexico, REITs are subject to a leverage limit of 50% and a minimum debt service coverage ratio as defined by regulation.

## 5.3 The role of investment funds in cross-border capital flows[129]

Capital flows can both support and weigh on economic development.[130] For example, capital flows via NBFI may play a growing role in transmitting financial conditions of AEs to EMEs.[131] International fund flows differ from other types of capital flows in their procyclical behaviour and their sensitivity to "push" factors (global determinants, eg global risk, global liquidity indicators) and "pull" factors (jurisdiction-specific determinants, eg institutional quality and macroeconomic fundamentals of the recipient jurisdiction).[132] In addition, research suggests global economic forces seem to prevail over domestic forces in explaining movement in international portfolio flows.[133]

Cerutti et al (2017) and Sarno (2016) found that the nature of a country's foreign investor base and depth (or liquidity) of the local financial market play a significant role in explaining the cross-country differences in EM sensitivities to global push factors. In particular, EMEs with deep financial markets and a high exposure to "fickle investors", explain the higher sensitivity of some EMEs to global push factors.[134] Furthermore, on recent developments, there is an ongoing discussion on the influence of benchmark-driven investors to portfolio flows to EMEs. According to the IMF (2019), the growing role of benchmark-driven investors seems to have contributed to a higher sensitivity of portfolio flows to global factors and the correlation across countries.[135]

This case study uses public and private sector data to analyse cross-border linkages through investments by funds domiciled in the 29 jurisdictions covered in this Report.[136] It focuses on equity and bond funds, which together account for 77% of the "other investment funds" sub-sector of OFIs. First, we discuss the relative importance of OFIs to total portfolio flows, followed by an analysis of portfolio allocations of funds domiciled in specific jurisdictions as well as an overview of trends in bond and equity fund flows. In the last two sections, our

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[129] This case study was prepared by Steven Dodkins (BoE), Tom Fong (HKMA), Max Gehrend (BCL), Christoph Kaufmann (ECB), Tania Romero (FSB Secretariat).

[130] For example, a fifth of all surges in capital flows to emerging market economies (EMEs) have ended in financial crises. Surges are defined as a net capital flow observation that lies in the top 30th percentile of both the country-specific and the full sample's distribution of net capital flows, expressed in per cent of GDP. See Ghosh, A, J Ostry and M Qureshi (2016). See also: Raddatz, C and S Schmukler (2012).

[131] Puy, D. (2016).

[132] Some common push and pull factor cited in the literature of capital flows are: (i) push factors: global GDP growth rate, VIX, changes in the expected US policy rate, slope of the US yield curve. (ii) pull factors: exports and imports, the level of public debt, the level of foreign exchange reserves (as per cent of GDP), the foreign exchange regime and its average real GDP growth rate.

[133] Sarno, L, I Tsiakas and B Ulloa (2016).

[134] Cerutti, E, S Claessens and D Puy (2017).

[135] IMF, April 2019 Global Financial Stability Report. See also Converse, N, E Levy-Yeyati and T Williams (2018).

[136] Even though the focus of this case study is funds domiciled in the 29 jurisdictions covered in this Report, the sample of jurisdictions included in the analysis of each section may vary due to data availability.

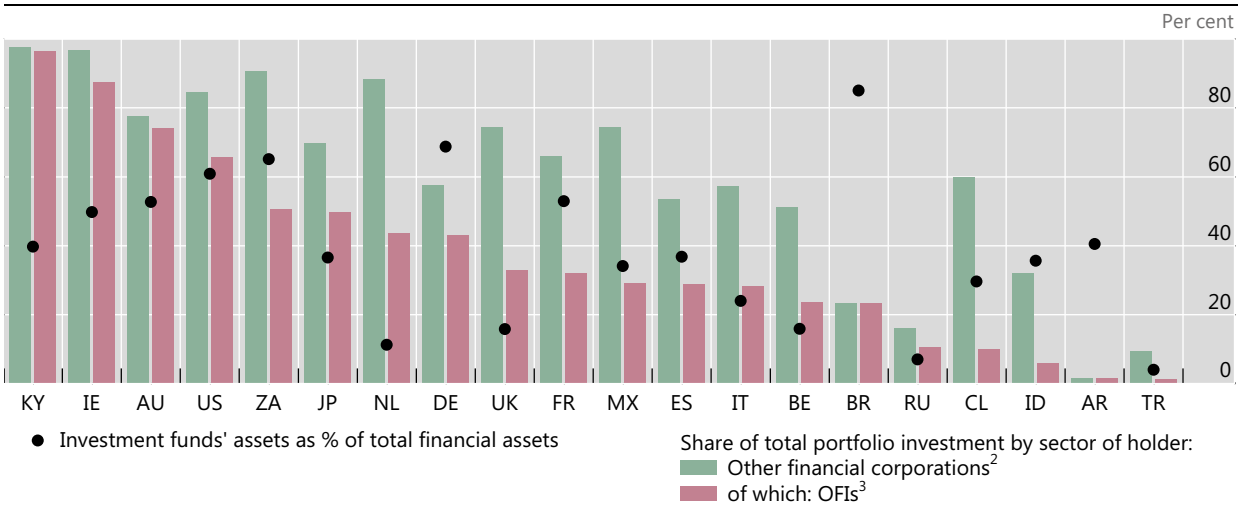
analysis focuses on jurisdictional-level flows[137] from funds domiciled in the 29 jurisdictions covered in this Report, sometimes grouping them into AEs and EMEs.[138]

The 2018 Report assessed interconnectedness not only among sub-sectors of the financial system, but also across jurisdictions.[139] The assessment of cross-border interconnectedness has highlighted that OFIs have significant cross-border linkages relative to their assets, driven to a large extent by investment funds. However, the monitoring exercise has not previously looked at the specific country allocations of investment funds. An analysis of investment fund allocation of assets in non-domestic jurisdictions contributes to an understanding of cross-border linkages through investment funds.

### *5.3.1 Importance of other financial corporations in cross-border flows*

Relative importance of other financial corporations in total portfolio investment

Total portfolio investment assets held by OFCs, by holder jurisdiction — Exhibit 5-7




[1] Portfolio investment is defined as cross-border transactions and positions involving debt or equity securities, other than those included in direct investment or reserve assets. [2] Other financial corporations includes insurance corporations, pension funds, MMFs and other (which includes investment funds). [3] Other financial corporations excluding insurance corporations and pension funds as proxy of OFIs. It includes the sub-sectors MMFs and "other" from table 3A of the IMF CPIS.

Source: Jurisdictions' 2019 submissions; IMF, *Coordinated Portfolio Investment Survey (CPIS)* authors' calculations.

According to the Coordinated Portfolio Investment Survey by the IMF, the relative importance of other financial corporations[140] (OFCs) in total portfolio investment (cross-border transactions and positions involving debt or equity securities) is typically high (Exhibit 5-7). OFCs hold the biggest share of the total portfolio investment in most

[137] Source: EPFR. EPFR data on country-level flows are subject to various sampling issues, however it has been intensively used in the literature due to its higher frequency. Actual data on country-level flows are not reported to EPFR, but they are calculated based on the reported data on fund flows and country allocations under certain assumptions about the country portfolio weights

[138] See Exhibit 1-1 in this Report for details on the sample composition.

[139] See Section 3.4 of this Report.

[140] OFCs include insurance corporations, pension funds and other financial intermediaries similar to the MUNFI measure used in this Report. However, the CPIS published sectoral breakdown is less granular, with the categories insurance corporations, pension funds, MMFs and "other". The reporting of data by sector of holder is encourage in the CPIS, but these data are not required for an economy to participate in the CPIS. We focus the analysis in this section to those jurisdictions that report full sectoral breakdowns of holder.

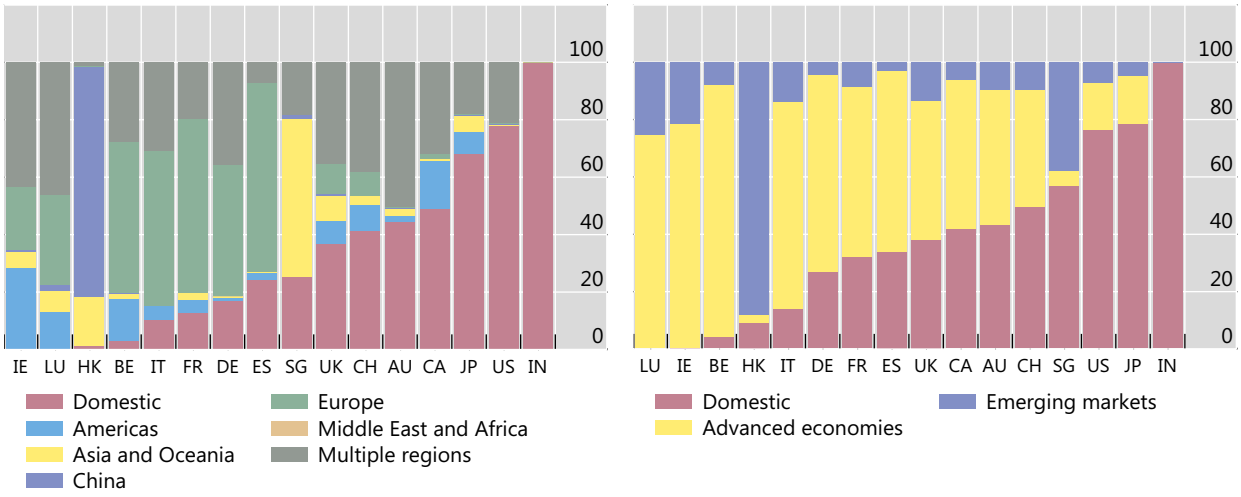
jurisdictions (15 out of the 20 jurisdictions with available data on portfolio investment by sector of holder). OFIs represented most of this share in two-thirds of the cases, particularly for those jurisdictions where other investment funds constitute a larger share of OFI assets.

### *5.3.2 International allocation of investment funds*

Investment focus of equity and bond funds, by domicile

As a percentage of total AUM as of end-2018 Exhibit 5-8

Distribution of funds by geographical focus[1] Allocations to AEs and EMEs[2]




Combined figures for equity and bond funds. Data for December 2018. The graph only displays countries for which the data coverage in the EPFR sample used in this case study is at least 20%, compared to the data collected for the main part of the Report. The 16 countries included in the graph account for 86% of global equity and bond funds. [1] Asia and Ocenia excludes funds which focus exclusively on Mainland China,. Multiple regions include the geographic focus: global, global EMEs, etc. Funds with an investment focus on their home region (eg. European focused funds domiciled in Germany) will also likely include investments in their domestic market. Therefore, the size of "domestic" bars in both panels might vary. For example, investment funds domiciled in Hong Kong with Asia and Oceania as investment focus may also allocate part of its assets to Hong Kong. [2] Shares calculated using estimated allocations as of December 2018.

Source: EPFR; authors' calculations.

The international portfolio allocation of investment funds varies considerably across jurisdictions, depending on the domicile of the fund.[141] Investment funds domiciled, for example, in India, the US or Japan, invest a large share of their respective portfolios in domestic assets. Similarly, investment funds domiciled in large euro area countries (eg France, Germany, Italy and Spain) have a strong regional focus on European markets (Exhibit 5-8, LHS).[142] Meanwhile, investment funds in the two largest euro area domiciles (ie Luxembourg and Ireland) have a more global focus, including a more significant allocation towards EMEs. Finally, investment funds domiciled in Singapore and Hong Kong allocated an important share of their assets to Asia, with those domiciled in Hong Kong investing primarily in China (Exhibit 5-8, RHS).

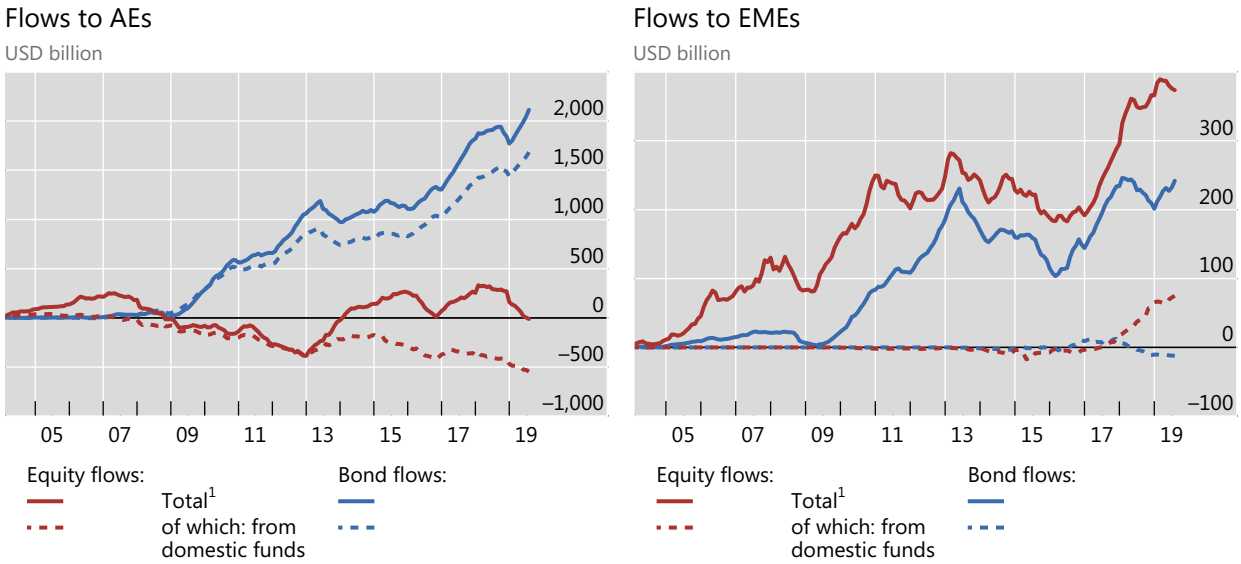
[141] Fund flows are regarded as "domestic" if the fund invests in assets from its resident jurisdiction and defined as "foreign" if the fund invests in assets from jurisdictions that are different from its domicile, such flows are calculated by EPFR based on the reported data on fund flows and country allocations under certain assumptions about the country portfolio weights.

[142] Funds with an investment focus on their home region (eg European focused funds domiciled in Germany) will also likely include investments in their domestic market.

### *5.3.3 Historical trends cross-border fund flows*

Fund flows to AEs and EMEs vary significantly over time (Exhibit 5-9). Flows from equity and bond funds to EMEs are mainly driven by cross-border allocations. Meanwhile flows from bond funds to AEs come mainly from domestic entities, whereas flows to AEs by equity funds show a more mixed picture. While cumulative flows from domestic equity funds were actually negative over the considered period, they were compensated by flows from foreign equity funds.

Cumulative total bond and equity fund flows, by type of recipient jurisdiction — Exhibit 5-9

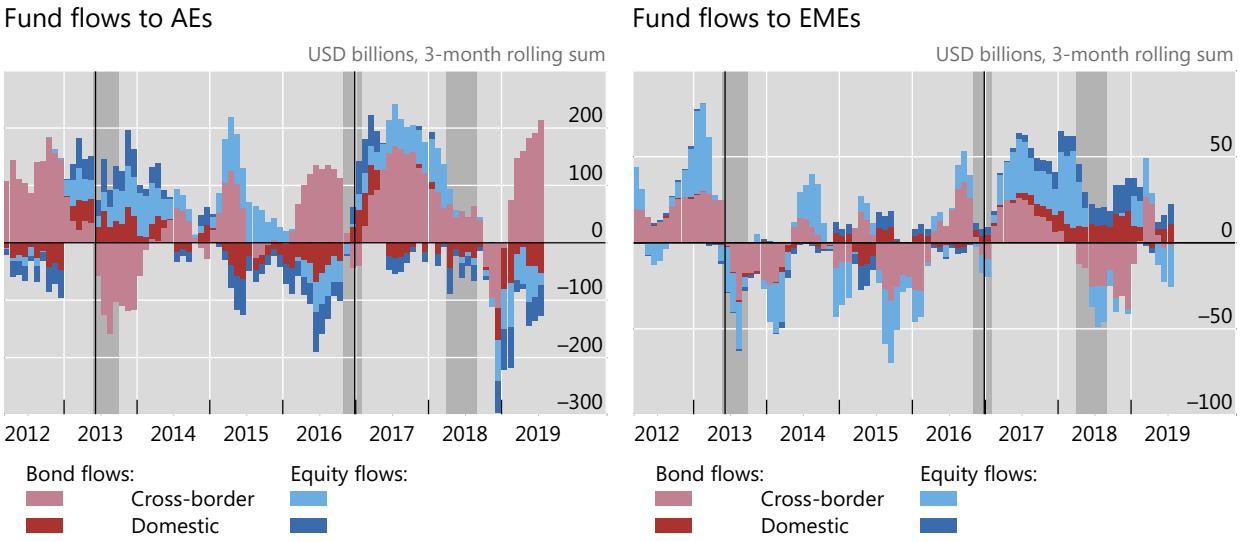



[1] Cumulative flows since 2005 from funds domiciled in the 29 jurisdictions covered by the monitoring exercise. The gap between the same colour solid and dashed lines relates to cross-border flows.

Source: EPFR; author's calculations.

The relative importance of cross-border flows to AEs has, however, increased after 2013 (as illustrated by the increasing gap between the solid and dashed lines in Exhibit 5-9 LHS). Cross-border equity flows to AEs in particular have increased substantially since 2013 and have offset in part the domestic outflows in certain periods, for example during 2015 and 2017 (Exhibit 5-10, LHS). Domestic and cross-border flows have at times offset one another in recent years, and cross-border flows seem to have been more sensitive during recent periods of heightened market volatility. For example, the increasing domestic flows to EMEs have cushioned some of the 2018 emerging market sell-off by foreign funds (Exhibit 5-10, RHS).

Fund flows[1] in recent stress episodes Exhibit 5-10




The vertical lines indicates in order: Bernanke's speech on 22 May 2013 and the rise in the US Fed funds rate in December 2016. The shaded areas highlights recent periods of heightened market volatility: taper tantrum (2013), US presidential election (end-2016) and the emerging market sell off in 2018.

[1] Flows from funds domiciled in the 29 jurisdictions covered by the monitoring exercise.

Source: EPFR; author calculations.

### *5.3.4 Key takeaways*

We have found that OFIs account for an important share of total portfolio investment, particularly in jurisdictions where investment funds represent the largest part of OFIs. Looking into bond and equity funds, the international portfolio allocation of investment funds varies considerably across jurisdictions, depending on the domicile of the fund. Cross-border fund flows seems to have reacted differently during recent periods of high volatility. However, a more detailed analysis is needed to understand the different factors behind the cross-border flows from these investment funds, and how the flows might relate to the global financial cycle.

# Annex 1: Summary table

Moving from MUNFI to the narrow measure

*29-Group*, in USD trillion

| | MUNFI | MUNFI components | | | | Excluded from narrow measure[1] | Narrow measure of NBFI | Narrow measure components (by economic function (EF)) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICs | PFs | OFIs | FAs | | | EF1 | EF2 | EF3 | EF4 | EF5 | Unallocated |
| **2006** | 91.2 | 19.7 | 20.0 | 50.5 | 1.1 | 64.3 | 26.9 | 11.3 | 3 | 6.9 | 0.1 | 5.4 | 0.2 |
| **2007** | 102.6 | 20.6 | 21.0 | 59.9 | 1.2 | 71.2 | 31.4 | 13.7 | 3.3 | 7.8 | 0.1 | 6.2 | 0.2 |
| **2008** | 99.6 | 19.3 | 19.8 | 59.3 | 1.2 | 69.6 | 30 | 13.8 | 3.6 | 6.1 | 0.1 | 6 | 0.3 |
| **2009** | 104.9 | 20.9 | 21.5 | 61.1 | 1.5 | 75.2 | 29.7 | 14.7 | 3.3 | 5.5 | 0.1 | 5.8 | 0.3 |
| **2010** | 113.0 | 22.3 | 23.4 | 65.7 | 1.6 | 84.7 | 28.3 | 15.9 | 3.2 | 3.5 | 0.1 | 5.1 | 0.4 |
| **2011** | 117.0 | 23.1 | 24.4 | 68.0 | 1.5 | 86.8 | 30.2 | 18 | 3.3 | 3.6 | 0.2 | 4.6 | 0.6 |
| **2012** | 127.3 | 24.8 | 26.1 | 74.7 | 1.6 | 94.0 | 33.3 | 21.6 | 2.8 | 3.7 | 0.2 | 4.3 | 0.7 |
| **2013** | 138.6 | 26.1 | 29.0 | 82.1 | 1.5 | 102.5 | 36.1 | 24.5 | 2.9 | 3.7 | 0.2 | 4.3 | 0.5 |
| **2014** | 152.2 | 28.1 | 30.7 | 91.9 | 1.6 | 112.5 | 39.7 | 27.5 | 3 | 4.1 | 0.2 | 4.3 | 0.6 |
| **2015** | 159.8 | 28.9 | 31.5 | 97.6 | 1.7 | 117.1 | 42.7 | 30.4 | 3 | 4 | 0.2 | 4.3 | 0.7 |
| **2016** | 172.1 | 30.5 | 33.3 | 106.5 | 1.8 | 126.0 | 46.1 | 33.5 | 3.2 | 3.9 | 0.2 | 4.4 | 1 |
| **2017** | 184.6 | 32.0 | 35.4 | 115.3 | 1.9 | 134.5 | 50.1 | 36.5 | 3.4 | 4.1 | 0.3 | 4.7 | 1 |
| **2018** | 183.6 | 32.1 | 35.5 | 114.0 | 2.0 | 132.7 | 50.9 | 36.6 | 3.6 | 4.5 | 0.3 | 4.7 | 1.1 |

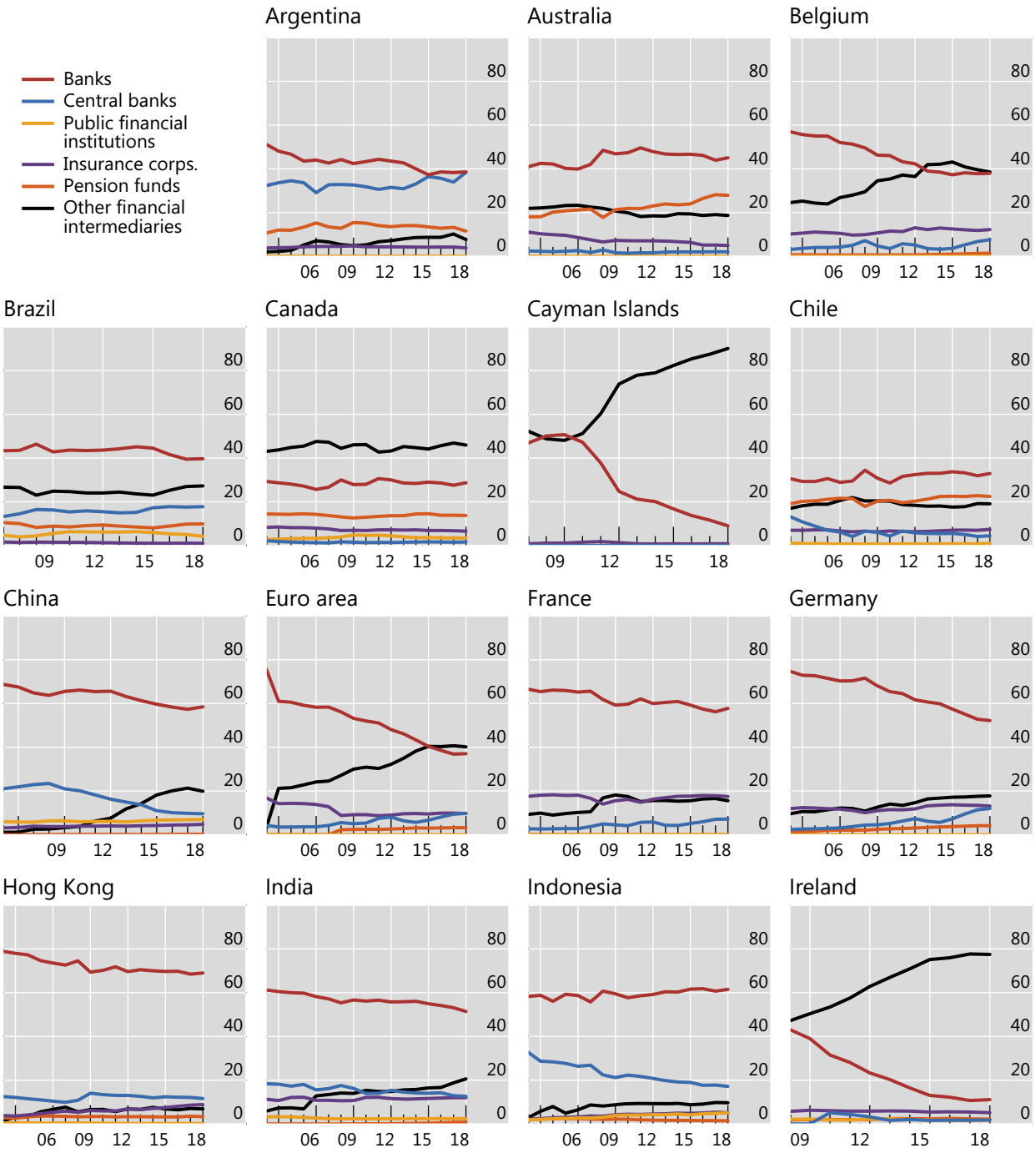
MUNFI = Monitoring universe of non-bank financial intermediation; ICs = Insurance corporations; PFs = Pension funds; OFIs = Other financial intermediaries; FAs = Financial auxiliaries; Unallocated = included in narrow measure but not allocated to a particular EF. Some exchange rate effects have been netted out by using a constant exchange rate (from 2018). As in previous Reports, the *29-Group* sample is used for the narrowing down section of this Report because of its greater granularity, Therefore, all the aggregates shown in this table relate to the *29-Group* sample and might deviate from the aggregates discussed in the macro-mapping section (which relies on *21+EA-Goup*). [1] Includes MUNFI entities classified outside the narrow measure, prudentially consolidated into banking groups, or that are part of the statistical residual (see Section 4.1).

Sources: Jurisdictions' 2019 submissions (national sectoral balance sheet and other data); FSB calculations.

# Annex 2: Jurisdiction-specific summaries

## Share of total national financial assets by jurisdiction

In per cent[1] Exhibit A2-1

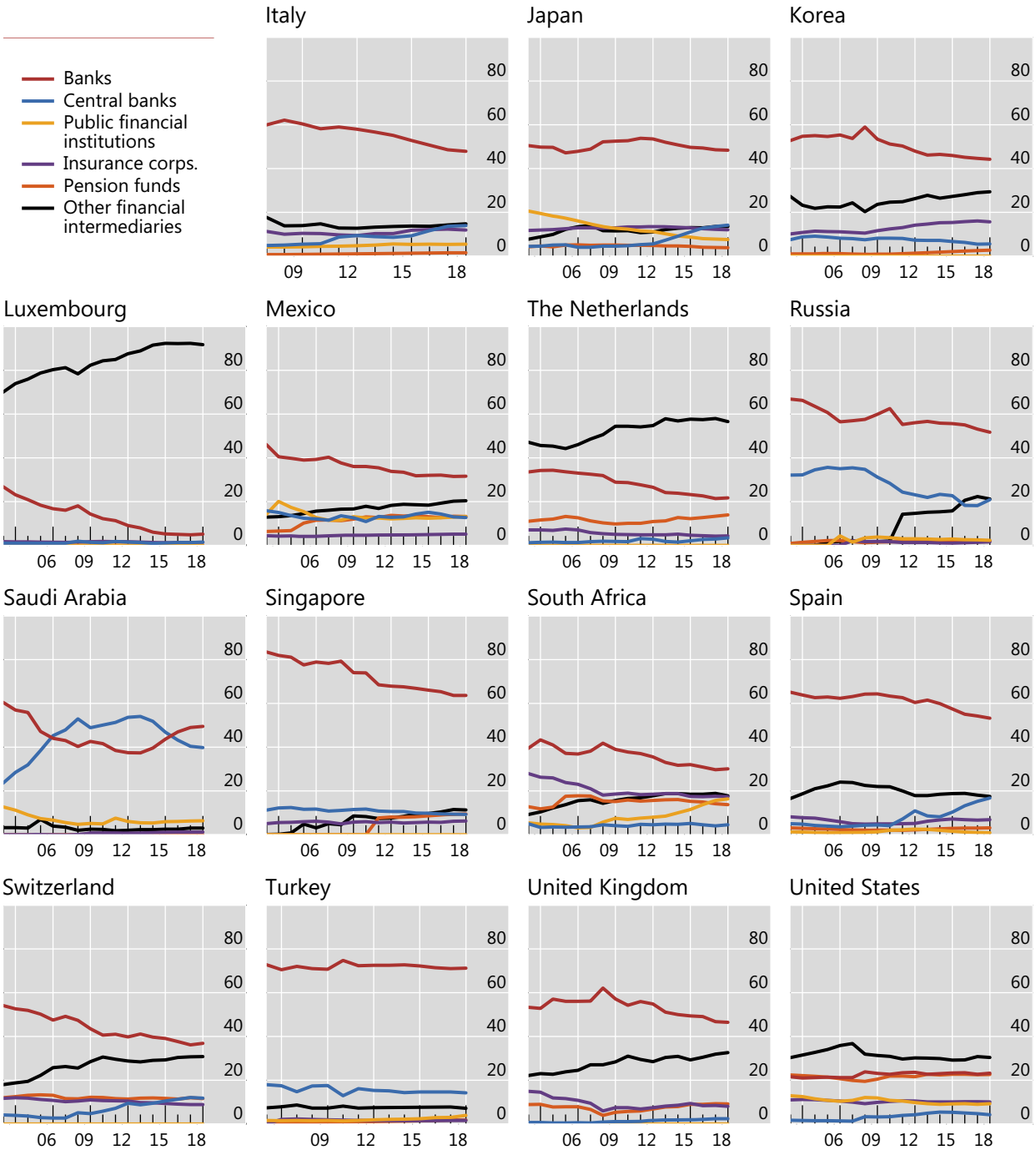



[1] Based on historical data included in jurisdictions' 2019 submissions. Exchange rate effects have been netted out by using a constant exchange rate (from 2018). [2] All deposit-taking corporations. [3] Also includes captive financial institutions and money lenders, and financial auxiliaries. Increases in the value of OFI assets may also reflect improvements in the availability of data for some OFI sub-sectors over time.

Source: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

## Share of total national financial assets by jurisdiction

In per cent[1] Exhibit A2-2




[1] Based on historical data included in jurisdictions' 2019 submissions. Exchange rate effects have been netted out by using a constant exchange rate (from 2018). [2] All deposit-taking corporations. [3] Also includes captive financial institutions and money lenders, and financial auxiliaries. Increases in the value of OFI assets may also reflect improvements in the availability of data for some OFI sub-sectors over time.

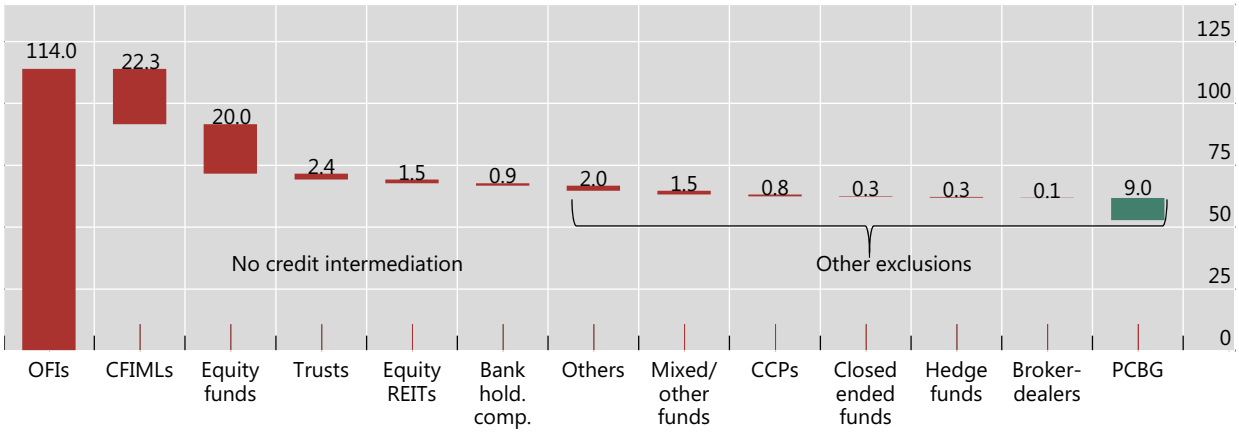
Source: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

# Annex 3: Exclusion of OFI entity types from the narrow measure of NBFI

The FSB's monitoring methodology allows for excluding from the narrow measure, entities included in MUNFI that either do not engage in significant credit intermediation, or engage in credit intermediation but were prudentially consolidated into a banking group. Accordingly, for the 2019 monitoring exercise, authorities performed a classification assessment and a series of mutual reviews to arrive at the narrow measure, and excluded $52.2 trillion of OFI assets that were included in the MUNFI measure. This Annex provides a breakdown of those non-bank entity types that were excluded from the narrow measure and the reasons for exclusion.

Exclusion of OFI entity types from the narrow measure

29 jurisdictions at end-2018, in USD trillion Exhibit A3-1




OFIs also includes CFMILs; CFMILs = captive financial institutions and money lenders; Equity REITs = real estate investment trusts and real estate funds; Bank hold. comp. = bank holding companies; Trusts = trust companies; CCPs = central counterparties; PCBG = prudentially consolidated into banking groups.

Sources: Jurisdictions' 2019 submissions (national sector balance sheet and other data); FSB calculations.

- **CFIMLs** are either: (i) part of non-financial corporations and used for the pass-through of capital; or (ii) consolidated into banking groups and thus excluded from the narrow measure.
- **Equity funds** invest principally in equity securities, and are not involved in credit intermediation. Equity funds and ETFs referencing equity indices that do not hold more than 20% of their AUM in credit-related assets are excluded from the narrow measure. These funds often hold a modest amount of cash and highly liquid fixed income assets for cash management purposes.
- **Trust companies** exist in several jurisdictions. In Singapore and South Africa, they provide a range of administrative and advisory services to individual clients, but are not CIVs. Korean trust accounts are separately managed (not CIVs) and closed-ended with limited leverage. Mexican trust companies that were not classified in the narrow measure invest mainly in equities of non-listed companies and infrastructure projects. Several types of Chinese trusts were excluded from the narrow measure including property trusts (which can only invest in non-financial assets), some non-bank-

affiliated single money trusts and collective investment trusts (unleveraged, closed-ended and/or invest primarily in equity assets).

- **Equity REITs** and real estate funds that invest in equities or directly in real estate have been excluded from the narrow measure as they do not engage in credit intermediation (in contrast with mortgage REITs).
- **Others** consist of relatively small OFI entity types, including: the European Financial Stability Facility (Luxembourg); non-securitisation or publicly issued SPVs (Brazil, Ireland and Korea), microfinance entities and peer-to-peer lenders (China); venture capital and private equity entities that are not, or are only marginally, engaged in credit intermediation (Belgium, Indonesia, Italy, Mexico, Spain and Turkey); central mortgage bond institution (Switzerland); Brazilian raffle savings companies; Indian self-help group loans; and Stokvels (informal savings clubs in South Africa).
- **Mixed/other funds** in Brazil, Hong Kong, India, Ireland, Korea, Luxembourg, the Netherlands and Turkey were assessed to be either not engaged in material credit intermediation, or presenting only negligible liquidity and maturity transformation risks and with immaterial leverage, or are not CIVs. For example, Discretionary Funds in Indonesia have been assessed not to be CIVs as they are separately managed and invest mostly in equities. South Africa did not classify fund of funds that invest in only equity or real-estate funds in the narrow measure.
- **CCPs** were excluded from the narrow measure due to the absence of credit intermediation. With both sides of the balance sheet typically matched, CCPs are not engaged in bank-like activities such as leverage or liquidity/maturity transformation. However, their collateral management activities may involve elements of liquidity/ maturity transformation.
- **Closed-ended funds** with limited maturity/liquidity transformation, and that are not leveraged, are not considered susceptible to runs in the same way that open-ended funds are, and have generally not been classified in the narrow measure unless a jurisdiction chose to include them following a conservative approach.
- Certain **broker-dealers** in some jurisdictions (Belgium, Hong Kong, Indonesia, Ireland, and the Netherlands) were excluded from the narrow measure as these entities are not engaged in credit intermediation (ie they act as “pure” brokers/agents for clients).
- **Finance companies** in Indonesia and India whose short-term funding is less than 10% of overall assets, as well as finance companies in China that provide internal financing and serve more as a treasury function, were not classified in the narrow measure.
- Certain **hedge funds** in Canada, India, and Ireland that largely do not engage in credit intermediation are excluded from the narrow measure. A small portion of hedge funds in Luxembourg was excluded from the narrow measure as they are closed-ended and employ no leverage, and thus were assessed to not pose significant financial stability risks from NBFI.

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