

IOSCO Investment Funds Statistics Report



OICU-IOSCO

**The Board
OF THE
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Executive Summary

The decade following on from the onset of the 2008 global financial crisis has seen the size of the global asset management sector more than double. The real economy has been the main beneficiary of this growth as the asset management industry has provided new sources of investment capital, while reducing the reliance on bank-intermediated credit funding. Conversely, this growth has also increased the number of questions raised about the potential risks to financial stability that investment fund activities may generate.

This report, covering not only hedge funds, but also open-ended and closed-ended funds, is the first of its kind by IOSCO and is underpinned by a broad data survey to which 50 IOSCO members have contributed; representing almost \$US50 trillion, or 67% of total asset under management of the global investment funds universe. It contains information on hedge funds as well as an initial analysis on open-ended and closed-ended funds, noting, however, that data available to regulators (and thus also to IOSCO) on these latter two types of funds is currently more limited in certain jurisdictions. Additionally, the report contains information on leverage as well as on other areas of the investment fund industry including: aggregate liquidity profile, counterparty risk, borrowing risk and collateral needs.

The report will be published on an annual basis with the aim of presenting insights on the global investment funds industry and any potential emerging risks within it. As more jurisdictions expand their reporting regimes, IOSCO expects the observations in this report to become more representative of the entire investment fund industry, including the open-ended fund universe, over time.

Leverage across asset management remains relatively low. Hedge Funds' gross leverage, as measured on a gross notional basis, stands at 12.4x net asset value, which, as reported in the previous hedge fund survey, has increased from 7.8x. Their net leverage stands at 1.1x. Open-ended funds' gross leverage stands at 1.68x net asset value while their net leverage stands at 1.12x. Closed-ended funds' gross leverage stands at 1.12x and net leverage stands at 1.03x, noting however that these figures may obscure higher levels of possible leverage on the balance sheet of the corporates in which private equity funds for example are invested.

Similarly, hedge funds appear, in aggregate, to have sufficient portfolio liquidity to meet potential investor redemptions in normal times. However, due to several important caveats including limited liquidity data for hedge funds and open-ended funds, it is difficult for the report to provide a full picture of potential risks, including with regards to counterparty risks and the funds' ability to meet margin calls. As more jurisdictions implement changes to their reporting framework, IOSCO expects to be able to conduct a more thorough analysis of liquidity in the future.

Chapter 1 – Introduction

The size of the asset management sector in the decade following the financial crisis of 2008 has increased markedly. Since 2008, the total assets under management (AuM) of investment funds globally have more than doubled.¹ While this development has provided new sources of credit and investment for the real economy and reduced reliance on bank funding, it has also raised questions about the potential risks to financial stability that the activities of investment funds may generate.

More specifically, concerns about the risks to financial markets stemming from liquidity mismatches at investment-fund level and the potential use of leverage by these funds have been part of regulatory discussions for the past decade.² The Financial Stability Board (FSB), for example, developed policy recommendations to address potential risks to financial stability stemming from the activities of investment funds in 2017.³

The use of leverage by investment funds raises potential risks to both: 1) investors, where it possibly amplifies losses during episodes of market stress; and 2) financial markets, more generally, where it first creates interconnections with other market participants and then could potentially act as a contagion channel during stressed market conditions.⁴ Liquidity mismatches may lead fund investors to overestimate the liquidity of the assets held in such funds. In times of stress, this may lead them to make significant redemptions to minimise their losses, thereby, potentially leading to stress in underlying markets if such investment funds do not have or do not appropriately use the liquidity management tools at their disposal.

IOSCO published its Final Report on Recommendations for a Framework to Assess Leverage in Investment Funds (“*Leverage Framework*”) in 2019. Following this publication, IOSCO turned its attention to developing the foundations that would underpin our global data exercise, the first result of which is this report.⁵

The leverage framework is a further step in IOSCO’s work on identifying risks stemming from leverage in the investment fund industry. IOSCO began a biennial data collection exercise as far back as 2009, the Hedge Funds Survey, to provide insight into the hedge funds industry and the risks it may generate at a global level. This IOSCO work was the result of a G20 request

¹ https://image-src.bcg.com/Images/BCG-Global-Asset-Management-2020-May-2020-r_tcm9-247209.pdf

² In 2018, IOSCO issued updated recommendations on liquidity management in investment funds in addition to a survey of liquidity management tool availability in 2015.
See: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD590.pdf> and <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD517.pdf>

³ <https://www.fsb.org/wp-content/uploads/FSB-Policy-Recommendations-on-Asset-Management-Structural-Vulnerabilities.pdf>

⁴ If the equity of a leveraged fund drops below zero, it is the counterparties that would bear the loss exceeding the capacity of the fund to reimburse.

⁵ <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD645.pdf>

and jurisdictions' response for increased regulatory oversight of hedge funds and their managers.⁶

This report is yet a further step. It analyses information on hedge funds as well as an initial analysis on open-ended and closed-ended funds, noting however that data on these types of funds is currently more limited across certain jurisdictions.⁷ Building on IOSCO's experience with the Hedge Funds Survey, this report goes beyond a simple analysis of asset class exposures and collects information on other areas of the investment fund industry including: aggregate liquidity profile, counterparty risk, borrowing risk and collateral needs.

Beyond hedge funds, jurisdictions' data collection of investment funds remains uneven across jurisdictions due to varying national reporting requirements. Future iterations of this report will likely contain more data as more jurisdictions expand their local regulatory reporting requirements to a broader scope of investment funds. As a consequence, this will not only contribute to IOSCO's data collection initiative but will also further improve IOSCO's picture of global risks stemming from asset management activities.

It is also worth noting that not all local asset management industries are at the same level of maturity and also differ in their size/footprint. Consequently, some jurisdictions may consider their domestic funds industry do not constitute a risk to global financial stability and may choose not to participate or may choose to participate in the survey, but not to the full data collection. In this case, some jurisdictions may not participate in the survey's full exercise, but rather provide only the AUM of their domestic industry.

As a result of this first expanded exercise, this report contains a synthesis of data received from 25 jurisdictions that have participated in the survey's full data collection exercise, to the extent permitted by their current local reporting frameworks and their local data availability. This information reflects almost a combined total AuM of \$US50 trillion.⁸ Additionally, 25 jurisdictions have opted-out from full participation and have reported the overall AuM of their domestic industry only, which represents a combined total AuM of \$US5.5 trillion.⁹ IOSCO and its members will strive to expand this reporting by including more data and jurisdictions in future iterations of this report.¹⁰

⁶ The IOSCO Hedge Funds Survey built on the UK FSA and the FCA's existing Hedge Fund Survey. A link to the 2009 G20 communique can be found here: https://www.imf.org/external/np/sec/pr/2009/pdf/g20_040209.pdf

⁷ Very few jurisdictions at this stage collect data on open-ended mutual funds. For example, there is currently no European-level data collection on UCITS funds.

⁸ The list of participating jurisdictions can be found in the relevant chapters.

⁹ A list of those jurisdictions can be found in the appendix.

¹⁰ Participating jurisdictions could either "*opt-in*" or "*opt-out*" from the survey's full data collection. "*Opt-in*" jurisdictions submitted data on at least one fund type(s) among hedge funds, open-ended funds and closed-ended funds. "*Opt-out*" jurisdictions submitted total AuM of their domestic industry only. While the data underpinning this report is primarily based on those jurisdictions that have either "*opt-in*" or "*opt-out*" from the full data collection, there are a number of IOSCO members that have not, to date, opt-in or opt-out. Based on Bloomberg data (as at 27 Oct 2010), this group roughly represents 90 jurisdictions, with a combined AuM of \$US 5.71trillion across 21,303 funds.

Structure of the Report

The rest of the report below presents IOSCO's initial analysis of the data received, with specific sections for each broad fund category, namely hedge funds, open-ended investment funds (OEFs) and closed-ended investment funds (CEFs). The report is set out as follows: Chapter 2 presents an overview of the information collected and includes a discussion on the data collection methodology. Chapter 3 presents the results of the global hedge funds industry while Chapters 4 and 5 present the results on OEFs and CEFs, respectively. Chapter 6 concludes with the main findings from this first iteration of IOSCO's Investment Funds Statistics report and areas for future consideration.

IOSCO believes such an exercise will enable the organisation and its members to gain better insight into the global investment fund industry and develop an overview of potential emerging risks associated with the activities of this industry, particularly over time, in order to focus global cooperation where it most matters.

Selected highlights of the report include:

Hedge Funds

- **the number of qualifying hedge funds captured in this exercise has increased, since 2018, by 19% to 2,546;¹¹**
- **in the two years since the last hedge funds survey, assets under management (AuM), as captured by the survey, increased 6% to \$US4.07 trillion;**
- **multi-strategy and equity long/short remain the most common investment strategies of qualifying hedge funds;**
- **for both cash securities and derivatives on a long/short basis, the largest exposures held by qualifying hedge funds are in sovereign bonds and cash equities;**
- **on a gross notional basis, however, interest rate and foreign exchange derivatives positions are the largest in terms of fund exposures;**
- **leverage, as measured on a gross notional basis, stands at 12.4x net asset value. Net leverage stands at 1.1x; and ¹²**
- **qualifying hedge funds seem to have sufficient portfolio liquidity to meet potential investor liquidity demands in normal times.**

Open-ended Funds (OEFs)

- **61,120 OEFs have been captured by this exercise, representing total AuM of \$US43 trillion;**
- **Equity funds are the most predominate type, a fact that also reflects that the largest asset holding of OEFs is in physical cash equities with very few aggregate short positions across all asset classes;**
- **In terms of derivatives exposures, on a gross notional basis, interest rate derivative and foreign exchange contracts are the largest exposures; however, these are traditionally used for hedging purposes;**

¹¹ For a definition of "Qualifying hedge fund", please see the methodology section in Chapter 2.

¹² Definitions for leverage metrics used in this report can be found in individual leverage subsections to follow.

- Overall, OEFs do not have large aggregate exposures through derivatives positions and, consequently are not leveraged by any meaningful metric. As measured on a gross notional basis, stands at 1.68x net asset value. Net leverage stands at 1.12x;¹³
- As more jurisdictions implement changes to their reporting framework, IOSCO expects to be able to conduct a more thorough analysis of OEF liquidity in the future.

Closed-ended Funds (CEFs)

- CEFs captured by the exercise totalled 19,072 with a total AuM of \$US 2.6trillion;
- Physical holdings of assets in CEFs with the largest holdings in real estate, predominate ahead of equities and corporate bonds;
- CEFs exhibit little to no leverage as measured by the metrics in the report. As measured on a gross notional basis, stands at 1.12x net asset value. Net leverage stands at 1.03x.¹⁴
- Although there may be leverage associated with private equity funds, such leverage does not reside in the fund itself but rather remains on the balance sheet of the fund's portfolio companies.

¹³ For further discussion, including caveats, please see Chapter 4

¹⁴ For further discussion, including caveats, please see Chapter 5.

Chapter 2 –Methodology of the IOSCO Investment Funds Statistics Report

2.1 Scope

All funds (except Money Market Funds) are within the scope of the survey’s data collection, unless specifically excluded by participating jurisdictions.

National Competent Authorities (NCAs) may, at their discretion, exclude funds types from this exercise if they believe that such investment funds do not exhibit significant leverage or financial stability risk. Where funds are excluded from the exercise by NCAs, the total net AuM of those funds is asked to be provided to IOSCO or otherwise made available publicly, on a best-efforts basis.

Table 1: Summary statistics: Number of funds and total AuM captured by this exercise.¹⁵

Fund Type	No. of Funds	Total AuM (\$US Billions)
Hedge Funds	2 546	\$ 4 068
Open-Ended Funds	61 120	\$ 43 027
Closed-Ended Funds	19 072	\$2 595

Source: IOSCO Investment Funds Statistics Survey, 2020

2.2 Methodology

Data collection is a multi-stage process, which relies on IOSCO members collating and then aggregating their domestic industry data in line with a pro-forma template developed by IOSCO. National-level data are provided to IOSCO where various checks for data consistency and cleaning take place before analysis begins.

The data collection has previously been conducted following the same methodology and using a similar template to that used for the IOSCO Hedge Funds Survey. To the extent possible, it leverages on the existing reporting requirements already in place in many jurisdictions (such as the Form PF and N-PORT in the United States and AIFMD reporting requirements and (ad-hoc, jurisdictional-level) UCITS reporting requirements in Europe).¹⁶

Structure of the data template used for collection

The data template contains three separate sheets. The first sheet refers to the collection of information related to hedge funds. It is consistent with the definitions, data collection and interpretation of data presented in previous IOSCO Hedge Funds Survey reports. More specifically, the firms and funds captured in the survey meet the following conditions:

¹⁵ For further discussion on the breakdown of these figures, please consult the relevant chapters in the report.

¹⁶ Since October 2015, the US Securities Exchange Commission’s staff has released quarterly *Private Fund Statistics* reports which provide a summary of recent private fund industry statistics and trends by aggregating data reported to the Commission by private fund advisers on Form ADV and Form PF. Form PF information provided in this report is aggregated, rounded, and/or masked to avoid potential disclosure of proprietary information of individual Form PF filers. ESMA publishes data on AIF since early 2019 as well on an annual basis
<https://www.esma.europa.eu/file/50580/download?token=REKCzQAz>

For hedge funds, they must:

- Qualify as a hedge fund, (i) either based on criteria defined in its local jurisdiction, (ii) based on its own declaration to its regulator or (iii) based on a combination of criteria, such as the use of leverage, the complexity of strategies, and the application of performance fees;
- Be at least partially managed by a regulated entity within their jurisdiction or marketed in that jurisdiction;
- Be managed by a single manager, which means fund of funds (or multi-manager funds) are excluded; and
- Be able to demonstrate that it manages at least \$US500 million of total global net assets (net AuM or NAV). This includes the sum of all accounts managed under the same strategy (for example including pooled funds and separately managed accounts), to ensure the product is fully captured.
- As with previous hedge funds survey exercises, to help avoid double-counting, “qualifying hedge funds” that are managed outside the US but are likely to have reported to the SEC were removed from the other participating jurisdictions’ data.¹⁷

For funds other than hedge funds, NCA reporting is generally based on the domicile of the fund. However, in some circumstances, data from funds whose asset managers are domiciled in other jurisdictions is not available to the NCA responding to IOSCO. In that case, a NCA does not need to provide data from these particular funds but has been encouraged, where possible, to provide an estimate of the total NAV of these funds.

The second and third sheets relate to information for OEFs and CEFs; seeking the same type of information as the one collected for hedge funds, where currently available in individual jurisdictions.

Overall, each sheet of the data template covers the following sections:

Section 1 – Universe information. This section includes general information on the number of funds in a jurisdiction, the total net asset value of those funds, the strategies employed by those funds and their geographical exposure.

¹⁷ One of the elements of data collection that has proved challenging in the past is the issue of double-counting, where the same underlying hedge fund may have reported data in more than one jurisdiction. For example, data collected in the US as part of Form PF pertains to hedge funds managed by those firms that are registered or required to register with the SEC. The SEC reporting thresholds are such that if hedge fund firms are large (more than \$1.5 billion in hedge fund assets) and have at least one qualifying hedge fund (more than \$500 million NAV), then any qualifying hedge funds the firm manages will be included within the US data. As a result, this requirement may pull in some funds that are managed outside the US. For the purposes of avoiding double counting in these cases, the survey has removed from the data of all other participating countries any funds managed by firms that are likely to have reported to the SEC. Because this methodology may skew the geographic distribution of fund manager location somewhat towards the US and under-represent other countries, this survey avoids showing a detailed breakdown of funds per jurisdiction of manager.

Section 2 – Asset Class Exposure information. This section collects the aggregated asset class exposures of the funds in a given jurisdiction, broken down by long and short position, where available.

Section 3 – Borrowing Risk Profile. This section collects information on the secured and unsecured borrowings of funds.

Section 4 – Counterparty risk information. This section collects information on collateral details, information about trading and clearing mechanisms and unencumbered cash levels.

Section 5 – Liquidity profile. This section collects data on the percentage of fund portfolios capable of being liquidated within given period and the periods within which investors could receive their redemption payments.¹⁸

2.3 Survey comparability and interpretation

While IOSCO has collected information on hedge funds for several years, this is the first time similar information has been collected on other fund types. To help ensure consistency of data collection, definitions have been aligned with those used in the previous hedge funds survey. This should aid the interpretation of results across fund types and across jurisdictions.

Hedge Funds

For hedge funds, while the definitions have remained consistent, the survey samples across different time periods are not, for a variety of reasons.

Firstly, hedge funds open and close regularly meaning the samples across time exhibit some level of survivorship bias. Additionally, in some jurisdictions, as is the case within IOSCO's own reporting request, reporting is voluntarily and subject to a threshold criterion for reporting, meaning that the number of hedge funds surpassing the threshold may differ from one year or another, as their individual AuM grows or decreases.

Finally, the number of IOSCO member jurisdictions participating in the exercise has also changed over time. For this exercise, jurisdictions such as Sweden, Poland and Austria have taken part for the first time in reporting their domestic hedge funds industries, while Switzerland, has not participated for this enlarged edition due to the logistics and timelines of a broad data collection exercise. Switzerland has however started to implement a dedicated data collection project and has committed to participate in future editions.

Open-ended and closed-ended investment funds

One challenge associated with funds other than hedge funds is that there currently are very few national-level data collection regimes that require the same level of granular reporting when compared to that of hedge/alternative funds. This means there are important caveats in the analysis of the data received under those sections.

Collection of UCITS funds data

There is currently no standardised reporting framework for UCITS funds, meaning only a few European jurisdictions receive UCITS data, based on their own national regulatory reporting requirements. As such, most European jurisdictions taking part in this exercise have not

¹⁸ This section is not part of the data collection template for closed-ended funds.

provided granular-level data for UCITS funds. Therefore, unless specifically noted in the report, the European data presented in this analysis is based solely on data submitted through the AIFMD reporting framework.

AIFMD applies to asset managers managing all types of funds that are not covered by the UCITS Directive (Directive 2009/65/EC) regardless of whether the alternative investment fund (AIF) is of an open-ended or a closed-ended type, whatever the legal form of the AIF, independently from whether the AIF is marketable to retail investors or not, and whether or not the AIF is listed. Those AIFs that are open-ended may not be subject to the same type of limitations on eligible assets or leverage as those required under UCITS.

Finally, where available, extra data points have been supplied through other supervisory means (for example, central bank supervisory data). Individual caveats to this effect are also included in the relevant figures and tables below. In the future, when and if the European legislative framework implements a reporting framework for UCITS funds, IOSCO expects the data set for European OEFs to grow.¹⁹

Collection of US Form N-PORT Data

US data on open-ended mutual funds were collected through publicly available N-PORT filings located on the SEC's EDGAR database. The data used in this analysis are obtained from all N-PORT filings made to the SEC with a reporting date of either October 31st, November 30th or December 31st, 2020, as registered funds may select different fiscal year-end reporting dates.

To allow for data comparability, fund-level data obtained through this process are aggregated, in accordance with a pre-defined template developed by IOSCO. However, some end-user discretion and interpretation has been used when mapping some fund-level data points to specific asset classes. In some instances, the N-PORT data fields do not map, or do not map directly, with the pre-defined template developed by IOSCO (for example, fund and investor liquidity profiles). Some of the data points may be obtainable after further delineation work (for example, providing a breakdown of financial and non-financial bond holdings) and cross-referencing with external databases (for example, providing a breakdown of investment grade and high-yield corporate bond holdings). Future iterations of this work will explore more granular presentation of the aggregated N-PORT data.

IOSCO believes that this exercise may be helpful to identify whether and to what extent there are potential risks to financial stability that may emerge from the investment funds industry. It is the first and, at this time, only exercise of its kind that provides a global overview of the industry based on supervisory data, noting that – at least for hedge funds - the jurisdictions with the global hedge funds industry's largest AuMs, have been consistently captured since 2014.

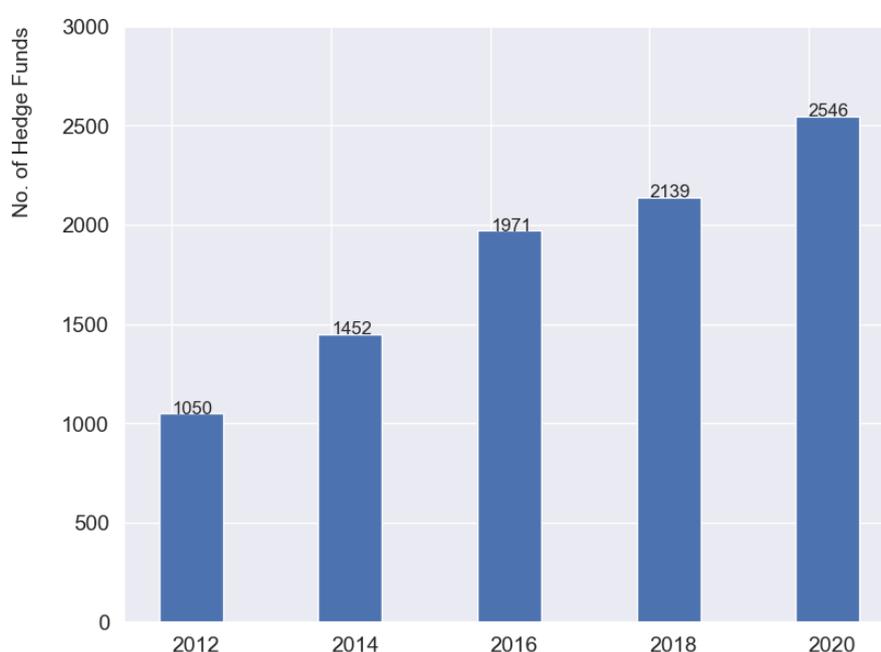
¹⁹ See, for example, potential considerations within the European framework – available at https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12648-Financial-services-review-of-EU-rules-on-alternative-investment-fund-managers_en

Chapter 3 – Hedge Funds Industry Analysis²⁰

3.1 The Global Hedge Funds Industry

Continuing IOSCO’s tradition of collecting data through the Hedge Funds Survey, this section presents the results of data gathered pertaining to qualifying hedge funds. For this exercise, the survey has captured data from 2,546 qualifying hedge funds as at 31st December 2020. Figure 1 highlights the growth in the number of qualifying hedge funds captured from previous editions of the IOSCO Hedge Funds Survey, noting a steady increase across the years. Comparing the 2020 figure to the previous survey (2,139 qualifying hedge funds), this increase represents a 19% growth from 2018. As reported in the last hedge funds survey, likely causes of growth may include newly established hedge funds entering into the market and increased reporting to national regulators.²¹ However, as pointed out earlier, the number of jurisdictions participating has also increased, although their additions have had a marginal impact.

Figure 1: Hedge Funds - Number of Qualifying Hedge Funds (2012-2020)

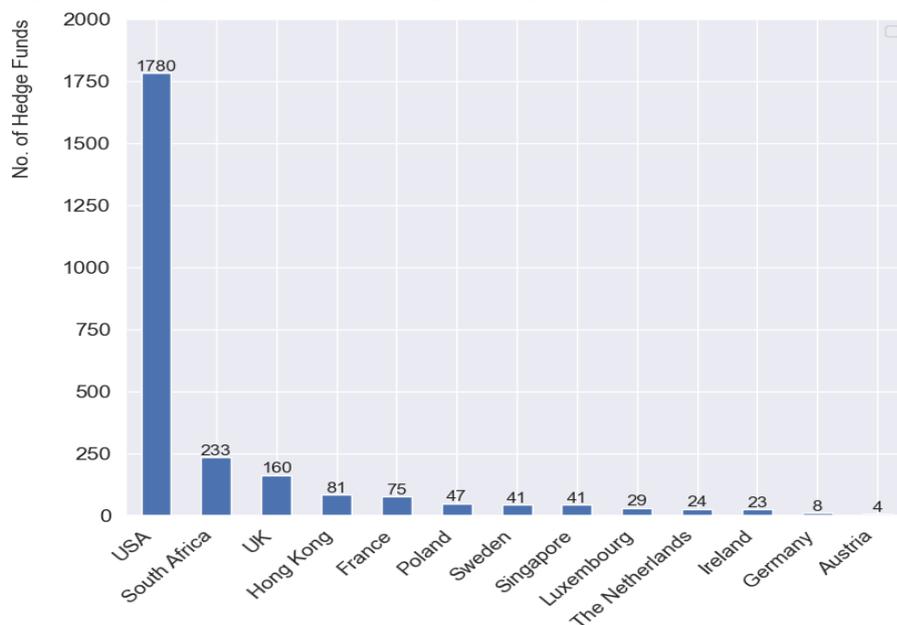


Source: IOSCO Investment Funds Statistics Survey, 2020

²⁰ For this chapter, unless mentioned with a specific caveat, the data underpinning the analysis in this chapter are sourced from the following jurisdictions: USA (SEC), Ireland, Luxembourg, UK, France, Germany, The Netherlands, Austria, Poland, Sweden, South Africa and Singapore. Additionally, data for the United States and Singapore are as of 30th September 2020. All other data are captured as at year end 2020.

²¹ For the 2018 IOSCO Hedge Funds Survey report, please see: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD587.pdf>

Figure 2: Hedge Funds - Number of Qualifying Hedge Funds by Jurisdiction (2020)²²



Source: IOSCO Investment Funds Statistics Survey, 2020

Note: 1) Data for the US and Singapore as at 30th September 2020; 2) among the reported data for French hedge funds, 10 out of the 75 are qualifying hedge funds, which represent 92% of the total AUM reported.

3.2 Assets Under Management

Total net AuM for the qualifying hedge funds sample captured by the survey, i.e., those funds above a minimum size threshold of over \$US500 million, is \$US4.07 trillion, as presented by Figure 3. When compared to the 2018 IOSCO Hedge Funds survey result of \$US3.84 trillion, the increase represents a 6% increase in net AuM. Despite being a lower bound estimate of the global hedge funds industry, as the exercise only covers those funds that are above the \$US500 million threshold, the result is consistent with recent estimates of the size of the global hedge fund industry based on third party vendor databases.²³

A combination of factors, in part, explains the increase. As already noted, more jurisdictions have participated in this exercise, making the results more representative of the global hedge fund industry. In addition, market dynamics are also likely to have played a role in this increase. For example, it is reported that hedge funds recorded their biggest gains in a decade in 2020, with the best performing hedge funds earning \$US127 billion for investors.²⁴ The rise in valuations, notably in equity markets, may have increased the AuM of some hedge funds, particularly as most hedge funds appear to focus their strategies on equity markets (following in Section 3.3 Investment Strategy). This would have led to a growth in AuM from the funds that already formed part of the survey's reporting but also possibly to some funds moving above the minimum reporting thresholds in their jurisdictions for the first time.

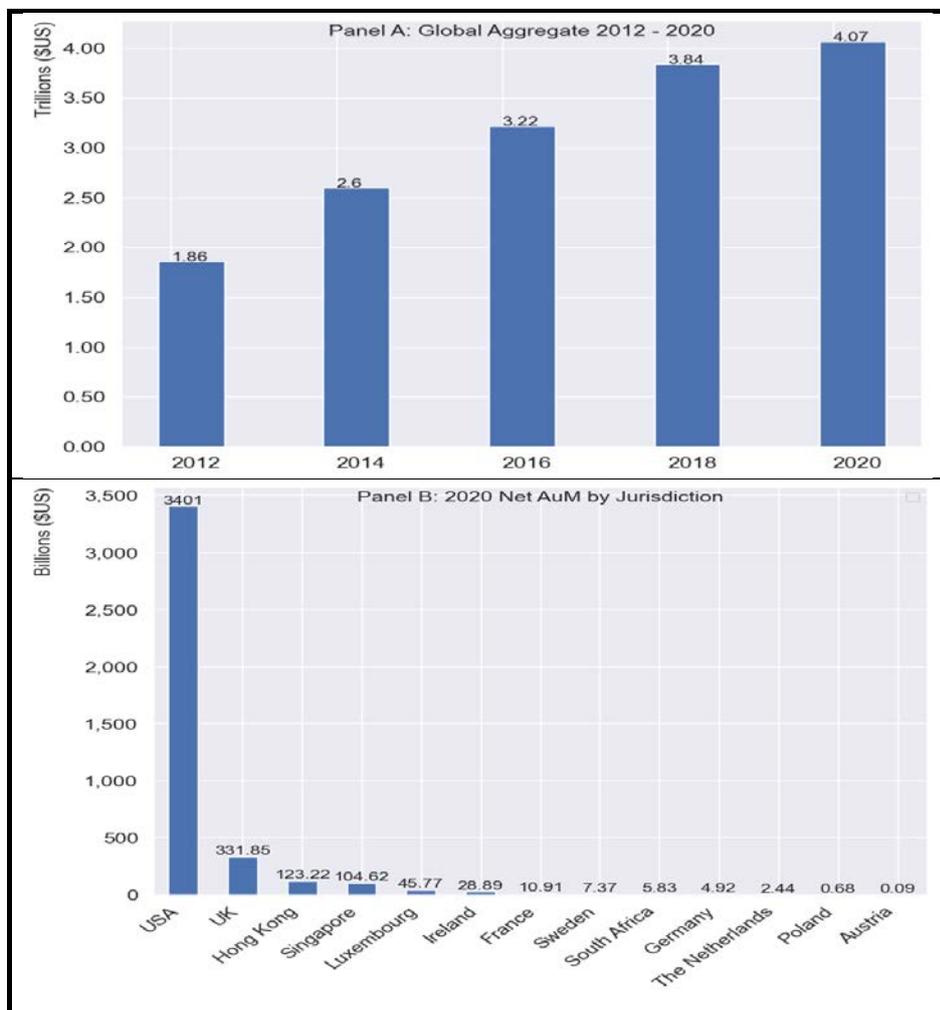
²² Data for the US and Singapore is as at 30th September 2020.

²³ For example, see HFR (2021): Global Hedge Funds Industry Report, which estimates the size of the global hedge funds industry at \$US3.8tril. Statista.com states global hedge funds AuM at \$US3.83tril (<https://www.statista.com/statistics/271771/assets-of-the-hedge-funds-worldwide/>)

²⁴ <https://www.reuters.com/article/us-hedgefunds-returns-idUSKBN29U00R>

When viewed in conjunction with the growth in the number of funds, a larger increase in total AuM may have been expected. However, the data is a “snap-shot” of hedge fund performance affected by supply side and demand side shocks induced by the Covid-19 global health crisis. As such, where data on funds was already reported, their influence on the growth of the total AuM will likely have been more muted as some funds experienced losses during the Covid-19 crisis.

Figure 3: Hedge Funds - Qualifying Hedge Funds Net Assets under Management (2012-2020)



Source: IOSCO Investment Funds Statistics Survey, 2020

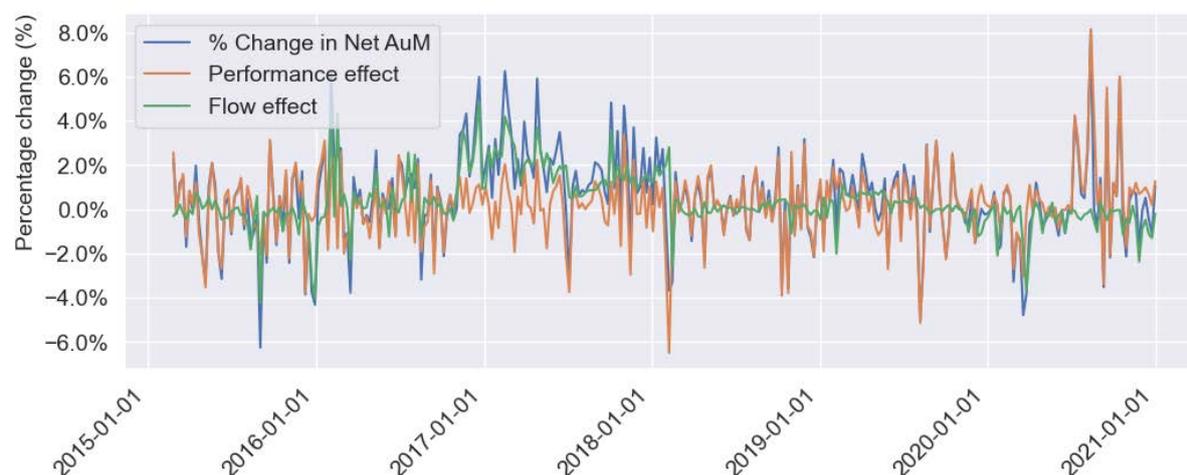
Note: 1) Data for the US and Singapore as at 30th September 2020; 2) among the reported data for French hedge funds, 92% of the total AUM reported represents qualifying hedge funds.

Figure 4 below attempts to highlight some of these points. When analysing the total hedge fund net assets for performance effects (those effects attributed to growth in the value of the underlying assets) and flow effects (the increase or decrease in AuM attributed to net subscriptions and redemptions), the figure highlights that the latter, flows into and out of hedge fund, although mildly positive, have not been a large driver of AuM of hedge funds since 2018. Rather, AuM is largely driven by market performance effects, i.e., a change in the valuation of the underlying assets of the hedge funds.

However, the performance effect on the rise of hedge fund AuM is not significantly different from zero between 2015-2020. This is largely in line with results from other sources which indicate that hedge fund performance has weakened in the past decade and, while not

necessarily a point relating to financial stability, potentially raises questions about the added value hedge funds bring to investors (beyond diversifications and reduced correlation benefits), in comparison to the fees that they typically charge.²⁵ This point is in-line with the vast body of academic literature pointing out active funds’ under-performance, in general, as compared to passive funds or benchmarks.

Figure 4: Hedge Funds - Analysis of aggregate change in hedge fund assets in performance and flow effects (2015-2020)



Source: EPFR, IOSCO calculations

3.3 Investment Strategy

“Hedge fund” is an umbrella term. Within that broad group, funds will pursue one or more specific investment strategies. In most cases, these fit within a dozen or so major categories of strategies. Figure 5 provides a breakdown of the most common investment strategies utilised by qualifying hedge funds and shows that equity-based strategies (such as long bias, long/short and market neutral) and multi strategies make up over one half of global NAV.

When comparing the investment strategy allocation over time, Figure 6 highlights that the investment fund strategies, as a percentage of NAV, have not changed drastically from 2016 to 2020. There are of course some exceptions, for example, “Event Driven Strategies”, as a percentage of NAV have fallen from 8% to 2.5%.²⁶ Similarly, Equity: Long/Short strategies have declined from 20% of global NAV to roughly 15% in 2020.

²⁵ Davis, P (2021): *Hedge Fund Performance: End of an Era?* Financial Analysts Journal (June 2021)

²⁶ Event-driven strategies are defined as a type of investment approach in corporations that are undergoing significant change, such as mergers, acquisitions, down-sizing, bankruptcy proceeding and other corporate actions. For the purpose of this exercise, event-driven strategies include: Distress/restructuring; equity special solutions; risk arbitrage, and merger & acquisitions.

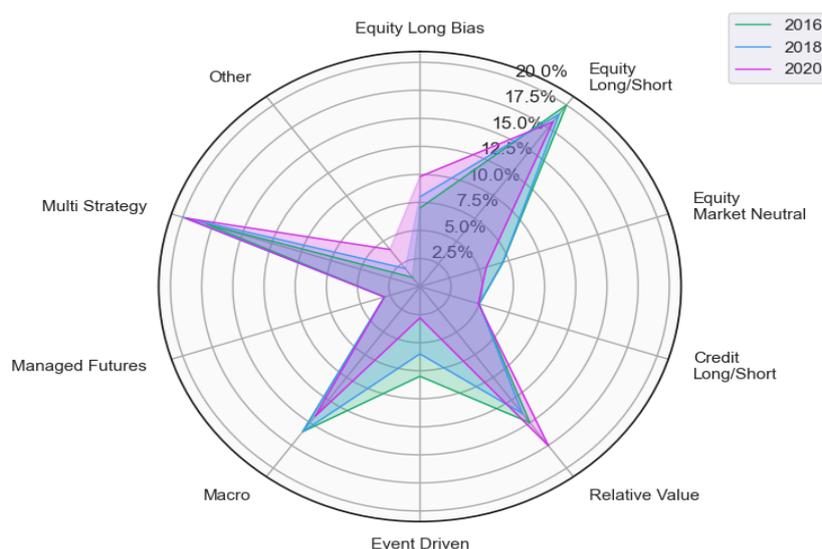
Figure 5: Hedge Funds - Top investment strategies by Assets under Management 2020



Source: IOSCO Investment Funds Statistics Survey, 2020

Note: May not add to 100% due to rounding

Figure 6: Hedge Funds - Comparing Hedge Fund Strategies across survey years



Sources: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Hedge Funds Survey 2016 & 2018 Data Collection Exercises.

Anecdotally, market intelligence discussions with market participants point to several factors that could be driving this change. First of which, is performance related. As markets have continued to rise over the last several years, short positions have been under pressure. With increased losses, there has been a transfer of long/short strategies, although still popular, to be more aligned with long bias. Another explanation for declines in long/short strategies is the “on-boarding” of long/short strategy management internally as large institutional investors look to bring inhouse the management of such strategies. As a consequence, such product offerings are no longer in demand by many long-term hedge funds investors.

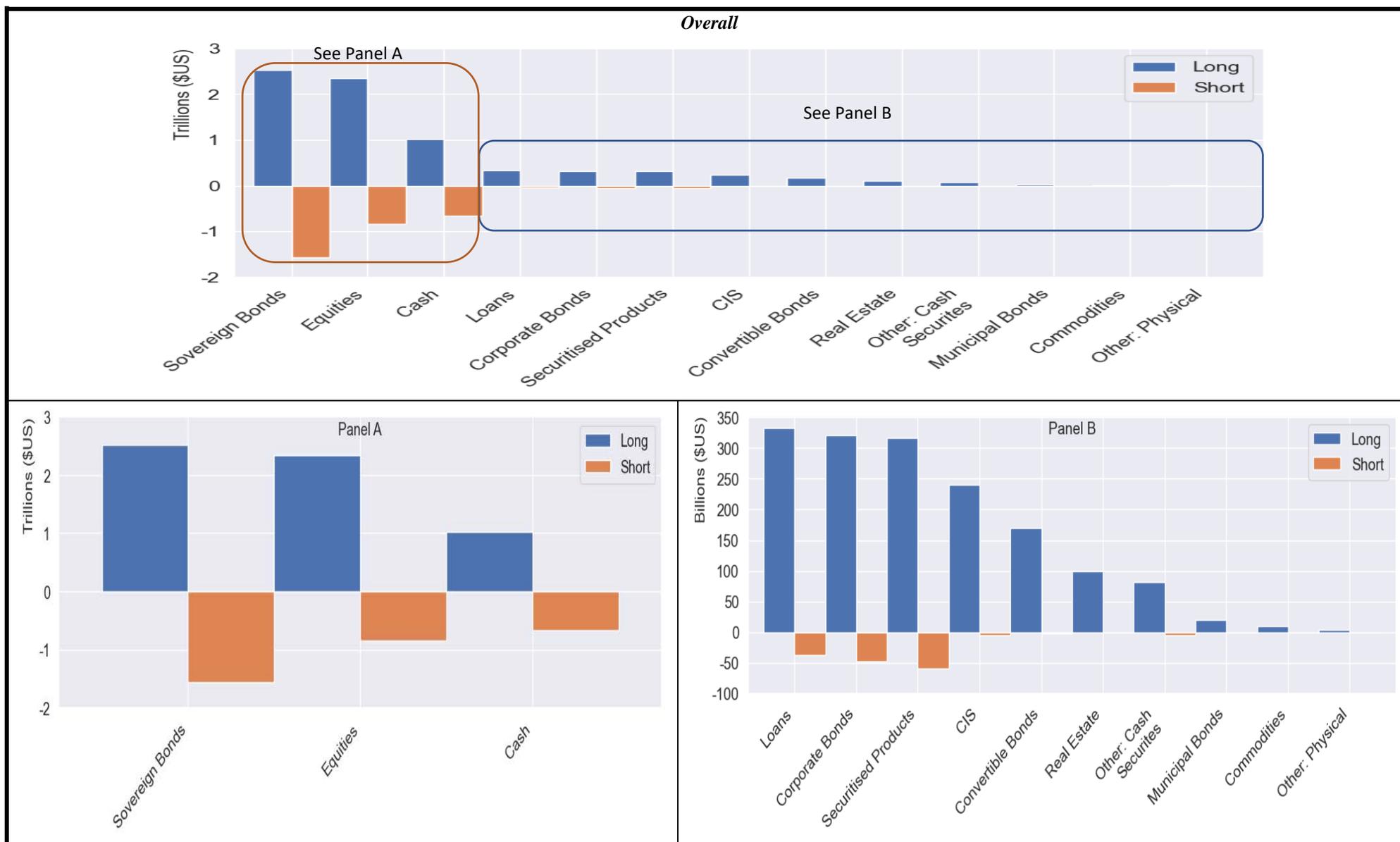
Additionally, in recent years, commodity trading advisor (CTA)/managed futures strategies have failed to perform and have come under increased competition. Finally, due to the economic impacts of the COVID-19 health crisis, many event-driven strategies centred on mergers and acquisitions (M&A) activities have declined, as these types of transactions have dried up.

The second relates to classification of funds. Within the industry, there has been a drift towards rebranding of funds away from standard categorisation conventions in an attempt to redefine their business lines, even though the underlying portfolio strategies may not differ substantially from well-defined strategy delineations.

3.4 Investment Exposures

Aggregate data on fund exposures to specific asset classes, for both long and short positions, are also collected, in an attempt to identify what asset classes may be more at risk from the use of leverage stemming from hedge funds. Figure 7 through Figure 10 below highlight the aggregate figures for both cash securities and derivatives positions. While most asset classes are presented in the charts as long and short exposures, due to current data collection requirements in a number of jurisdictions, this delineation is not possible for interest rate (IR) and foreign exchange (FX) derivatives, for which the only figure we have refers to the gross exposures.

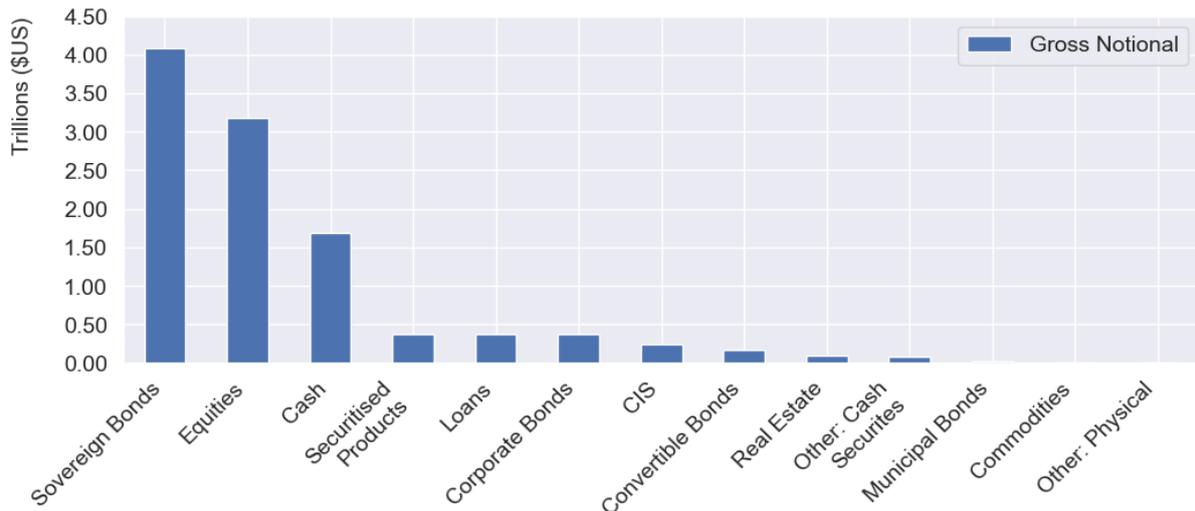
Figure 7: Hedge Funds - Cash/Physical Securities – Long and Short Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

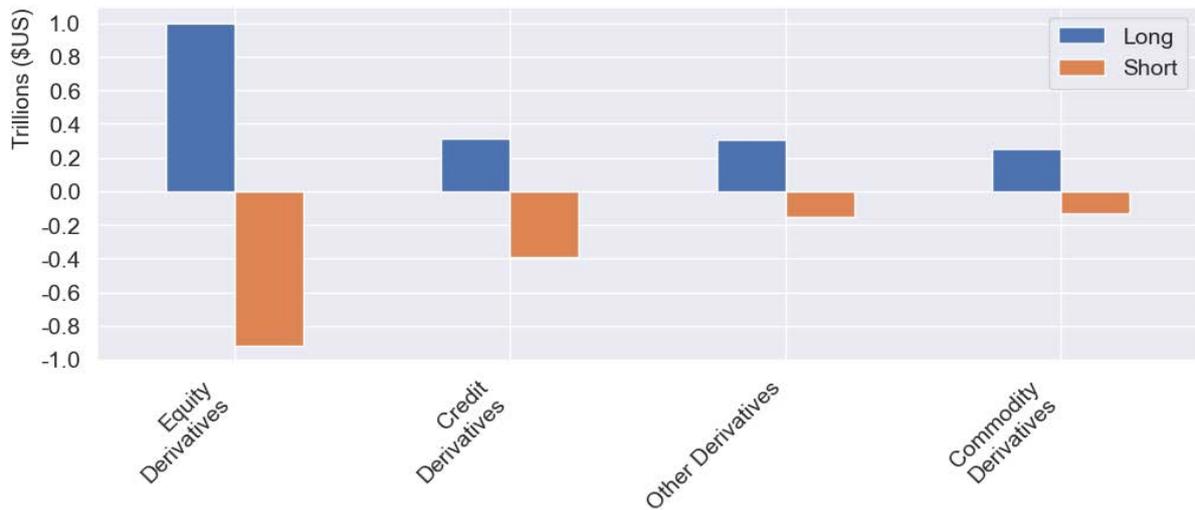
Notes: This figure should be interpreted as follows: The top chart presents all aggregate asset class exposures held by hedge funds. This figure is further broken down into Panel A and Panel B. Panel A delineates asset class exposure by the three largest asset class exposures, while Panel B drills down into the remaining asset classes.

Figure 8: Hedge Funds - Cash Securities – Gross Market Exposure



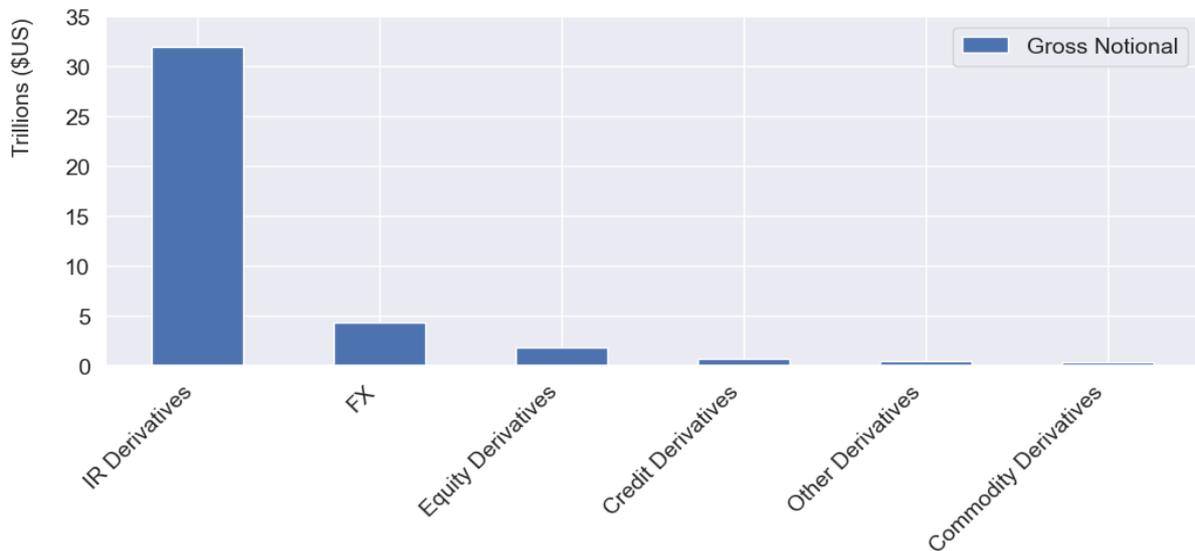
Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 9: Hedge Funds - Derivatives – Long and Short Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 10: Hedge Funds - Derivatives – Gross Exposures



Source: IOSCO Investment Funds Statistics Survey, 2020

Overall, and excluding IR and FX derivatives, the largest long and short exposures in cash securities are held in sovereign bonds and cash equities (see Figure 7) while equity derivatives are the largest derivatives exposures held by funds (see Figure 9). This is consistent with the survey results on the investment strategies followed by the vast majority hedge funds. Interest Rate and FX derivatives are the largest exposures held by qualifying hedge funds globally (see Figure 10) on a gross basis.²⁷

Box 1: Leveraged investors and their role in Treasury markets

Introduction

The US Treasury market plays an important role in the global financial markets and provides a benchmark for pricing other debt-related assets. Given the integral, interconnected role it holds, large scale dislocations in this market have the potential to affect other markets. Undoubtedly, one such event was the volatility experienced in the US Treasury market in March 2020, due to the onset of the COVID-19 pandemic.

What initiated the market dislocation?

When compared to other financial assets, the US Treasuries market is one of the deepest and most liquid financial assets globally. This means that market participants are able to trade these assets at low cost, whenever they want. In March 2020, as financial markets came to terms with the real economy impacts of the COVID-19 shock, some market participants looked to sell their treasury holdings outright in an attempt to boost cash reserves or to reduce market risk. Others sold these assets to reinvest in different asset classes such as taking advantage of depressed equity prices, while others experienced losses in other parts of their portfolio and needed cash to cover, amongst others, margin calls.²⁸

Role of Leverage Investors

In recent months, however, it has become clearer, through more targeted research, that the Treasury market volatility in 2020 had numerous complex reasons.²⁹ Often cited reasons for the market dislocation, include:

1. general widespread uncertainty of the economic impacts of COVID-19;
2. regulation that has limited banks and dealers' ability to warehouse asset inventory;
3. liquidity impact of the "working from home" environment, which impairs the networks that traders rely on to execute trades; and
4. the role of leverage in the system.

Specifically, to this last point, in the 20 months following this episode, the role of leveraged investors (for example, hedge funds) in treasury markets during the COVID-19 related volatility has been the focus of international policy work. The key focus of the work relates

²⁷ While data from the US reports interest rate derivatives in terms of 10-year bond equivalents, other jurisdictions report them based on the notional values of the contracts, which may far outweigh the amount at risk in these transactions.

²⁸ Cheng, J; Wessel, D, and Younger, J (2020): "How did COVID-19 disrupt the market for U.S. Treasury Debt?", Brookings Institute

²⁹ Committee on Capital Markets Regulation (2021): *Nothing but the Facts: The U.S. Treasury Market During the COVID-19 Crisis*.

to their involvement in the Treasury markets, specifically around their selling behaviour into the market and the marginal effects their leverage positions may have had on their need for liquidity.

In the initial period directly after the COVID-19 related volatility, some commentators speculated that hedge funds were the main cause for the market volatility. For example, Schimpft *et al* (2020) suggest that relative value hedge funds were a major source of the dislocation.³⁰ Specifically, they posit that the unrolling of large, leveraged positions in US treasuries was a source of dislocation that also amplified through margin effects to other funds that, they assume (correctly or incorrectly), are required to systematically adjust their portfolios with no discretion in allocation. However, their analysis is based on macro-level financial data, which fails to split out the actual trading behaviour of hedge funds from other financial markets participants. In short, it assumes all effects are solely attributable to the unwinding of hedge fund trading strategies.³¹

In the last few months, several authors have published further evidence that calls into question the economic impact of hedge fund selling in the Treasury market place.³² For example, the FSB pointed to a \$US300 billion sell-off of Treasury holdings by foreign investors in the first quarter of 2020. Official foreign institutions, including central banks, accounted for one third of the selling; a volume greater than the estimated \$US 90 billion attributed to the hedge fund industry.³³

More importantly though, to account for these funds level effects, further recent research, conducted by the US Department of Treasury's Office of Financial Research (OFR), has focused specifically on the activity of US-based hedge funds, using supervisory data collected through the SEC's Form PF filing. Although this recent literature focuses on the role of US-based hedge funds only, according to this report, the US hedge funds industry account for 84% of the global industry in terms of AuM and 60% in terms of the number of entities operating. As such, any research focus attributed to the US hedge funds industry, will provide a representative analysis of the industry as a whole. Based on this fund level data, this recent OFR research outlines several important observations:

- Overall, leverage in hedge funds is a nuanced issue. Due to scaling effects in their payoff profile between low-beta and high alpha securities, there exists little evidence of a linear relationship between leverage and risk, with elevated leverage levels in hedge funds imposing little to no further risks to their portfolio;³⁴

³⁰ Schrimpf, A; Shin, H.S and Sushko, V (2020): "*Leverage and margin spirals in fixed income markets during the Covid-19 crisis*", BIS Bulletin No.2, <https://www.bis.org/publ/bisbull02.pdf>

³¹ While it could also be underlined that unwinding relative value spreads (long treasuries vs. short futures Treasuries) impact first and foremost the spread: net flows stemming from selling securities and buying the equivalent notional through derivatives is about neutral. Therefore, the contribution of the drop in US Treasuries prices that can be imputable to the unwinding of these relative value positions should not be in excess to the increase of the securities / derivatives spread.

³² Di Maggio, M (2020): "*The Role of Hedge Funds in the 2020 Treasury Market Turmoil*", Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3698415>

³³ Financial Stability Board (2020): "Holistic Review of the March Market Turmoil".

³⁴ Barth, D; Hammond, L and Monin, P (2020): "*Leverage and Risk in Hedge Funds*", Office of Financial Research Working Paper 20-02, <http://dx.doi.org/10.2139/ssrn.3544304>, which discussed balance sheet leverage of hedge funds, where balance sheet leverage does not account for synthetic leverage arising from off-balance sheet derivatives.

- Hedge funds lowered their allocation to US treasuries and exited the turmoil with more liquid portfolios;³⁵
- They also retained bilateral US treasury repo volumes and haircuts, suggesting that the leverage risk transmission channel by the repo channel was not significant;
- Some relative value hedge funds, due to their use of treasury futures, faced greater margin funding pressure and did unwind their US Treasury positions in March 2020, causing selling into the marketplace.³⁶ However, their unwind was more a consequence of, rather than a cause of, the treasury market dislocation.³⁷

Conclusion

The US treasuries market is one of the most actively traded and liquid asset classes globally. Due to its nature as a ‘risk-free’ asset and its status as a hedge against uncertainty during stressed market conditions, the market is widely used by a multitude of market participants and therefore interconnected. Overall, the reasons for the stress-event in US treasury markets, induced by the COVID-19 macro-economic shock, are varied, nuanced and complex. Consequently, any assessment of the role of individual players in the marketplace during this stress event needs to be viewed through the lens of market-wide interactions. However, recent research does appear to suggest hedge funds had a minimal role in the dislocation of the US Treasuries market.

Asset Class Breakdown

Leverage metrics (which are presented in the following section) may not, in isolation, provide a better understanding of where exposures are being built up. IOSCO’s Leverage Framework suggest an approach that seeks to address these limitations, which is to express such metrics by asset class.³⁸ An asset class breakdown provides the percentage of a core set of investment exposures typical of an investment fund. Table 2 presents such a breakdown using the data collected for this exercise and highlights these funds are mostly long on physical cash equities and sovereign bonds, thereby exhibiting little leverage.

³⁵ Kruttli, M. S; Monin, P.J; Petrasek, L, and Watugala, S.W (2021): “*Hedge Fund Treasury Trading and Funding Fragility: Evidence from the COVID-19 Crisis*” Finance and Economics Discussion Series 2021-038. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2021.038>

³⁶ Kruttli, M. S; Monin, P.J; Petrasek, L, and Watugala, S.W (2021): “*Hedge Fund Treasury Trading and Funding Fragility: Evidence from the COVID-19 Crisis*” Finance and Economics Discussion Series 2021-038. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2021.038>

³⁷ Barth, D and Kahn,R.J (2021): “Hedge Funds and the Treasury Cash-Futures Disconnect”, Office of Financial Research Working Paper 21-01, <https://www.financialresearch.gov/working-papers/2021/04/01/hedge-funds-and-the-treasury-cash-futures-disconnect/>

³⁸ IOSCO Final Report: Recommendations for a Framework Assessing Leverage in Investment Funds; See pg 10.

Table 2: Hedge Funds - Qualifying Hedge Fund Market Exposure, broken down by asset class on a long/short basis

Asset Class	Long	Short	GNE without adj.*	Long (%NAV)	Short (%NAV)
Cash	\$ 1,020,212,687,109	\$ 663,917,758,882	\$ 1,684,130,445,990	25.12%	16.35%
Equities	\$ 2,344,345,097,810	\$ 838,029,702,244	\$ 3,182,374,800,053	57.72%	20.63%
Corporate Bonds	\$ 321,480,795,764	\$ 47,753,224,126	\$ 369,234,019,891	7.91%	1.18%
Sovereign Bonds	\$ 2,524,657,002,084	\$ 1,562,854,419,265	\$ 4,087,511,421,348	62.16%	38.48%
Municipal Bonds	\$ 19,685,564,162	\$ 518,159,468	\$ 20,203,723,630	0.48%	0.01%
Convertible Bonds	\$ 169,557,411,929	\$ 2,243,354,618	\$ 171,800,766,547	4.17%	0.06%
Securitized Products	\$ 316,320,235,326	\$ 58,619,900,691	\$ 374,940,136,017	7.79%	1.44%
Loans	\$ 332,722,423,260	\$ 37,057,515,949	\$ 369,779,939,209	8.19%	0.91%
Other Cash Sec.	\$ 81,338,629,918	\$ 4,318,110,706	\$ 85,656,740,624	2.00%	0.11%
Real Estate	\$ 100,058,430,196	-	\$ 100,058,430,196	2.46%	0.00%
Commodities	\$ 9,793,563,502	-	\$ 9,793,563,502	0.24%	0.00%
CIS	\$ 239,850,134,120	\$ 4,913,777,453	\$ 244,763,911,574	5.91%	0.12%
Other Physical	\$ 4,244,018,977	\$ 399,110,706	\$ 4,643,129,683	0.10%	0.01%
Equity Derivatives	\$ 1,001,200,848,976	\$ 914,498,081,340	\$ 1,915,698,930,315	24.65%	22.51%
Credit Derivatives	\$ 315,974,074,315	\$ 389,083,542,982	\$ 705,057,617,297	7.78%	9.58%
Commodity Derivatives	\$ 250,547,029,162	\$ 129,225,195,236	\$ 379,772,224,398	6.17%	3.18%
Other Derivatives	\$ 310,143,557,034	\$ 150,743,933,611	\$ 460,887,490,646	7.64%	3.71%
Foreign Exchange**			\$ 4,368,484,134,203		
IR Derivatives**			\$ 32,026,657,283,727		

Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: * GNE without adj: This metric represents the gross market exposure of a fund calculated by the absolute values of the notional amounts of a fund's derivatives and the value of the fund's other investments; ** indicates that data was collected on a gross notional basis only. Long short split is not available.

3.5 Leverage

Leverage is a financial technique generally used to increase investment exposure. Leverage allows a fund to increase its potential gains (as well as potential losses) by using financial instruments and/or borrowed money to increase the fund's market exposure beyond its net asset value. Leverage can come in a variety of different forms, for example, via debt borrowing (also known as financial leverage) or via some types of derivatives (also known as synthetic leverage) and, in the case of hedge funds, is not typically subject to strict regulatory leverage limits and/or other soft "leverage requirements" such as asset concentration limits. For the purposes of this report, the results on leverage are delineated by these two categories.

Notional Analysis

This section looks at the market value of cash securities and notional derivatives exposures of the qualifying hedge funds for which data are collected in the survey. By aggregating the total long and short positions across the sample of funds, we can roughly estimate the total leverage employed by these funds. There are several ways this can be done.

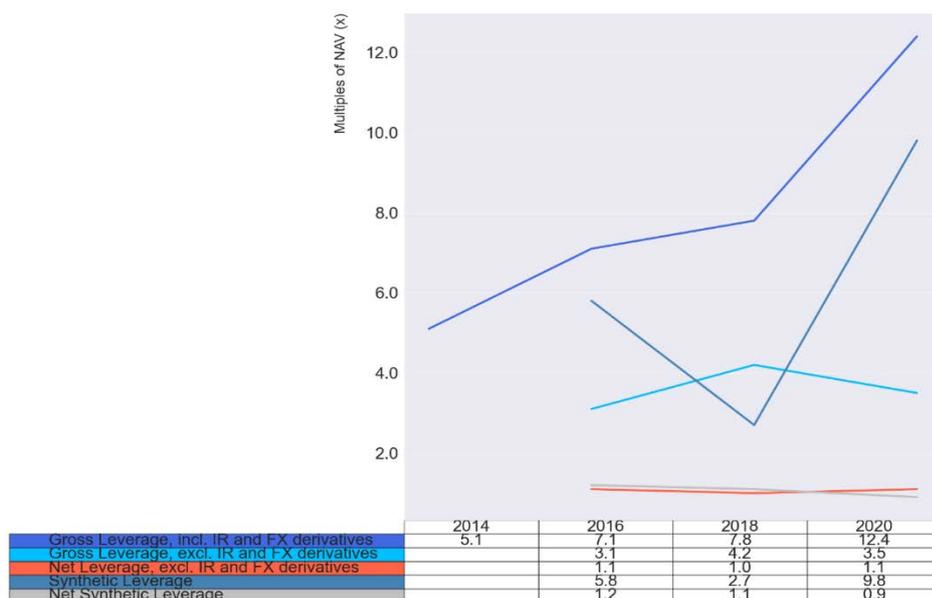
- First, by adding the absolute value of all positions, leverage can be estimated on a gross basis.
- Second, under the assumption of fully offsetting positions within asset classes, by subtracting the short positions from the long positions for the same asset class, leverage can be estimated on a net basis.
- Finally, by using the estimate of the gross notional exposure of outstanding derivatives only, as a proportion of the NAV, synthetic leverage can be estimated. Figure 11 below presents the results of these selected metrics.

For 2020, gross leverage employed by qualifying hedge funds is estimated as 12.4x NAV. When compared to the results of the prior years, this represents a potential increase in leverage employed by qualifying hedge funds. However, interpreting this trend in isolation can be misleading for several reasons. First, this survey exercise represents a repeated cross-section, with the sample of qualifying hedge funds changing for the 2020 exercise. That is, the pool of qualifying hedge funds sampled has changed, along with the number of jurisdictions taking part. Second, each data point represents a point-in-time estimate, with portfolio exposures being a function of macro-economic factors at that time - factors that do not remain constant. Third, the nature of these leverage metrics is such that they do not provide a meaningful measure of the actual economic risk of the fund. Fourth, the gross leverage figure is significantly skewed by the inclusion of large notional amounts from interest rate and foreign exchange derivatives transactions. Although such assets are used by certain hedge funds to take a leveraged directional view or take up relative value positions, these asset classes might also be used for hedging purposes.³⁹ For example, a significant portion of the increase in 2020 can be attributable to macro-strategy hedge funds in several jurisdictions that made heavy use of

³⁹ Relative value positions are generally low risk and low reward strategies. In order to generate a meaningful risk / reward profile, such positions need to be substantially leveraged. The gross leverage of such positions are not representative of the actual risks of the position, except in case they are forced to unwind during liquidity stress episodes.

interest rate derivatives. Hence, by excluding those asset classes from the calculation, gross leverage is 3.5x NAV, which is a decrease compared to the 2018 Hedge Funds survey.

Figure 11: Hedge Funds - Notional leverage figures by selected metrics (2014-2020)⁴⁰



Sources: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Hedge Funds Survey 2014, 2016 & 2018 Data Collection Exercises

Note: blank cells indicate data was not collected for that data point

On this last point, the use of derivatives does not necessarily imply leverage. In fact, there are many uses for derivatives, including hedging to reduce the risk of a portfolio, engineer a “structured trade” comprising many offsetting trades that capture short-term, small discrepancies between assets that are tightly tied such as relative value strategies (e.g., futures against a basket of securities) or to isolate and gain exposure to specific risks along the yield curve. Transactions costs are another reason for the use of derivatives. In many cases, it is cheaper to execute some strategies via derivatives products, which may provide the same payoff economically as holding (or shorting) the physical underlying (for example, being short a single-named CDS has the same payoff profile as being long the physical underlying bond).

Under certain circumstances, these latter points may imply a leveraged position. However, at a minimum, it points to a contractual arrangement that has the potential to create legally-binding liabilities on the funds in the form of variation margin payments and/or “out-of-the-money” written contract settlements. Unencumbered cash levels are important here, when viewed in conjunction with margin payments. It provides an insight into a fund’s

⁴⁰ Definitions:

- Gross leverage is estimated as the absolute sum of all positions (both cash and derivatives positions) (GNE), divided by NAV;
- Net leverage offsets long and short in the same asset class, allowing compensations even among different funds, and then sums the remaining position. The final summation (including cash positions) is divided by NAV;
- Synthetic Leverage is the absolute sum of the notional amounts of the fund’s derivatives positions only (including IR and FX derivatives), divided by NAV;
- Net Synthetic Leverage excludes IR and FX derivatives and offsets positions in the same derivatives asset class, even among different funds, before summing the remaining positions. The final summation is divided by NAV.

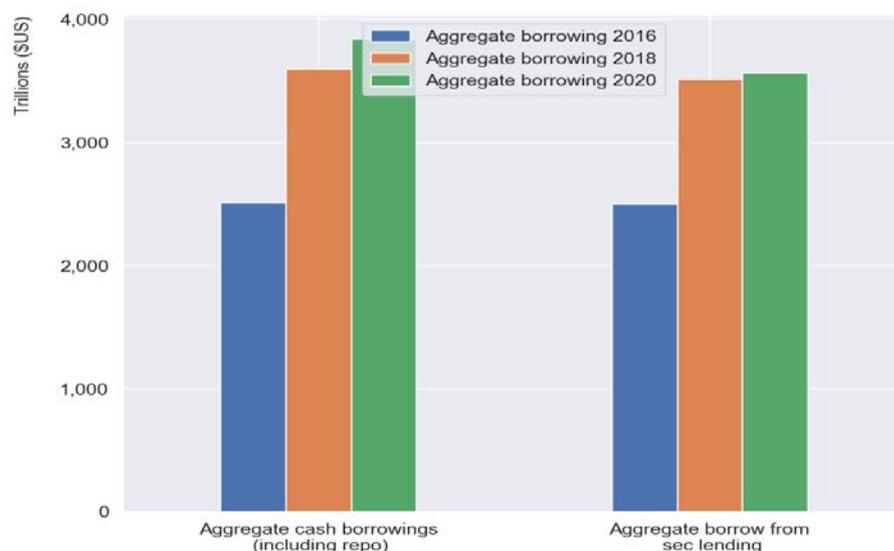
ability to meet potential future claims against it. Future iterations of this analysis will work towards collecting more comprehensive data in this regard.

Finally, on hedging, one way to account for such practices, although not a perfect measure, is to calculate the net leverage measure, which, among different funds, offsets long and short positions in the same asset class.⁴¹ This metric for 2020 is calculated at 1.1x, which: 1) indicates qualifying hedge funds are not leveraged according to this measure; and 2) is not materially different from the 2018 result.

Financial Leverage

Financial leverage is described as the amount of cash borrowed (secured or unsecured) as a proportion of investors' capital; it is essentially a type of leverage that uses debt. It shows the increase in exposure via cash borrowing and, as such, is analogous to the classic accounting definition of debt-to-equity. Figure 12 below graphically represents the amount of cash borrowing (secured and unsecured) by qualifying hedge funds in the sample.

Figure 12: Hedge Funds - Secured and Unsecured Borrowing (2016-2020)

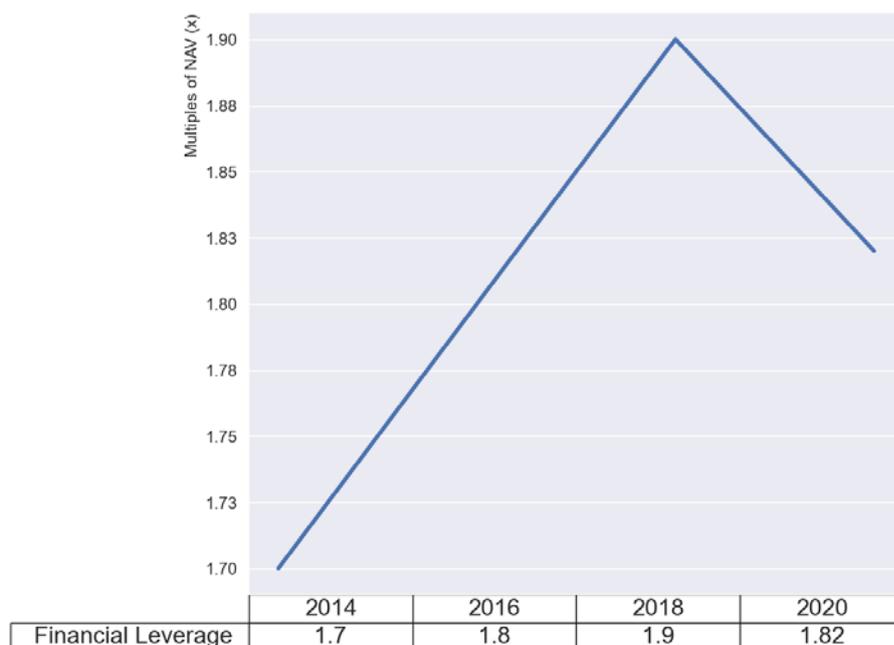


Sources: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Hedge Funds Survey 2016 & 2018 Data Collection Exercises

Overall, the amount of secured and unsecured borrowing by qualifying hedge funds totalled \$US3.8 trillion, with \$US3.56 trillion being secured borrowings through repo transactions, credit from prime brokers and other sources of lending (see Collateral section below for a discussion on collateral posted). This observation implies a financial leverage ratio of 1.82x NAV, which is a marginal decrease on the figure reported in the last survey (See Table 3).

⁴¹ Further, this indicator assumes that long positions in a fund compensates short position in another fund. As a consequence, this indicator underestimates leverage risk and is different from the one that would have been calculated by adding net leverage calculated individually by each fund.

Table 3: Hedge Funds - Financial leverage (2014-2020)



Sources: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Hedge Funds Survey 2014, 2016 & 2018 Data Collection Exercises.

3.6 Collateral, Unencumbered Cash and Cleared trades

The survey collected information on the aggregate amount of collateral posted by hedge funds to counterparties, which could take the form of cash (or cash equivalents) and other assets (including securities).

Overall, qualifying hedge funds across the sample indicated that they had posted a total of \$US4.4 trillion as collateral. Additionally, reported unencumbered cash of hedge funds was \$US1.15tril, which implies a cash ratio of 0.28.⁴² In the following years, as other data points are collected and provided by IOSCO members, IOSCO hopes to look at the ratio of unencumbered cash to margin posted. Such a metric will provide insights as to how much cash is on hand to meet margin calls and is another metric of leverage in the fund.⁴³

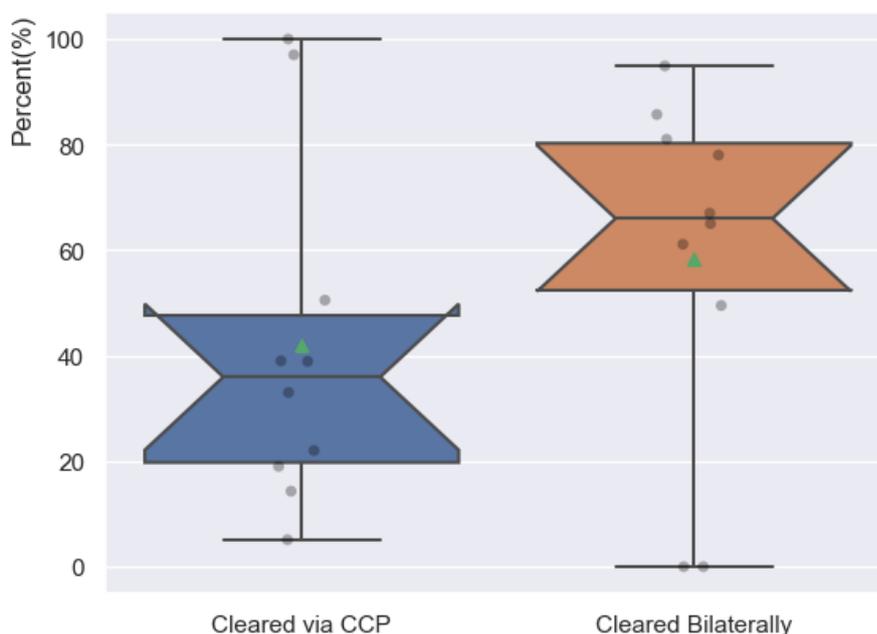
Contrast this with the figures for secured borrowing presented in the financial leverage section. The qualifying hedge funds in the sample indicated that secured borrowings were \$US 3.56 trillion (in aggregate), compared to collateral posted of \$US4.4 trillion. In short, secured borrowings undertaken by qualifying hedge funds seem, on aggregate, to be over collateralised. However, this interpretation needs to be qualified. Collateral, as captured, accounts for all collateral posted by qualifying hedge funds, including for margin (both initial and variation margin). Hence, the figure presented here is an upper-bound estimate of the amount of

⁴² The cash ratio is a simple fund liquidity ratio, analogous to the accounting “Acid test” ratio. It is calculated by dividing unencumbered cash by NAV and a broader measure encompassing cash equivalents that can be easily liquidated within a short period of time.

⁴³ The effects of margin calls is the subject of ongoing international work, conducted jointly by IOSCO, BCBS and CPMI. At the time of writing, the joint working group had published a consultation report *Review of margining practices* on the results of their analytical work. The jointly published 2021 consultation report can be found here: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD686.pdf>

collateral used to secure funding. It should be noted however that the lack of data on margins mean it is difficult to identify and quantify risks.

Figure 13: Hedge Funds - Distribution of trades cleared by CCP and Bilaterally (2020)



Sources: IOSCO Investment Funds Statistics Survey, 2020

Note: 1) The above figure is interpreted similar to a traditional “box and whiskers plot” style chart, in that it highlights the following information: a) the high and low data points represented by the two horizontal lines at the end of the “whiskers”; b) the 25%, 50% and 75% quartiles, which are the bottom, middle and top lines in the coloured areas, respectively; c) the actual data captured (the shaded dots); and d) the mean as the green triangle 2) Distributions presented are based on jurisdictional-level data.

Figure 13 above highlights the distribution of cleared trades (both centrally and bilaterally cleared). Overall, more trades are cleared bilaterally by hedge funds in the sample, with the median around 65% of trades. Contrast this with centrally cleared trades, which is around 40% of trades.

3.7 Liquidity

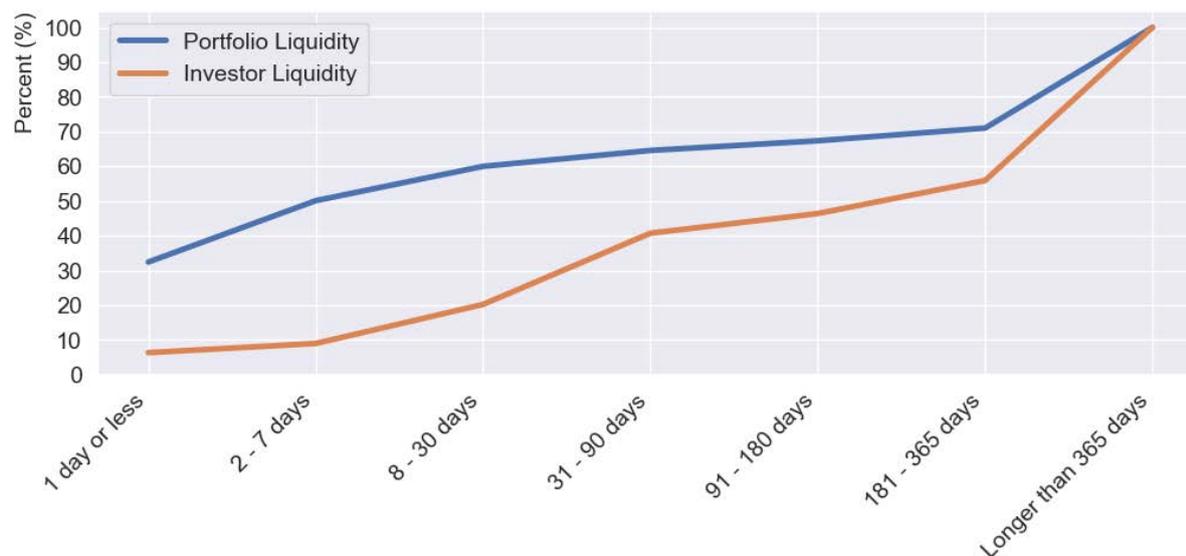
The liquidity profile looks at the fund’s ability to meet investors’ potential redemption demands with the underlying liquidity of the portfolio. Figure 14 below highlights this relationship between portfolio liquidity and the liquidity offered to investors.

The blue line represents the amount of the fund portfolio, on average, that could be liquidated at each time period. The red line represents investors’ ability to redeem, on average, at each time period. Therefore, to ensure that portfolio liquidity is sufficient to provide the liquidity offered to investors, the blue line should be above the red line. The difference between the two lines can be considered as a liquidity buffer.

On aggregate, we see that for every time period, portfolio liquidity appears to be sufficient to meet investor’s offered liquidity under normal market conditions. However, it is worth noting that Figure 14 only represents the portfolio and investor liquidity in normal times and does not take into account other liquidity demands (such as margin calls) that may be placed on hedge

funds.⁴⁴ Additionally, the calculation methodology pools all assets and all liabilities in one global balance sheet and, therefore, allows funds with excess liquidity to compensate for funds with liquidity mismatches. As such, some caution is required when interpreting this figure because, in practice, there are other liquidity demands on hedge funds and there are no transfer of liquidity between funds.⁴⁵ More granular data would be needed for NCAs to carry out a more accurate assessment at fund level.⁴⁶

Figure 14: Hedge Funds - Average Cumulative Portfolio and Investor Liquidity Profile for Qualifying Hedge Funds



Source: IOSCO Investment Funds Statistics Survey, 2020

⁴⁴ While portfolio liquidity does in principle represent normal market conditions, the IOSCO guidelines (and in Europe the AIFMD) highlight that with respect to investor liquidity, funds should take into account “the shortest period within which the invested funds could be withdrawn or investors could receive redemption payments, as applicable”.

⁴⁵ However, one could avoid some of the aggregation across all funds by calculating, for each fund, the difference between investor and portfolio liquidity at each time category, then plotting the distribution of difference at each bucket level. The overlap at the tails is important as much as the aggregate.

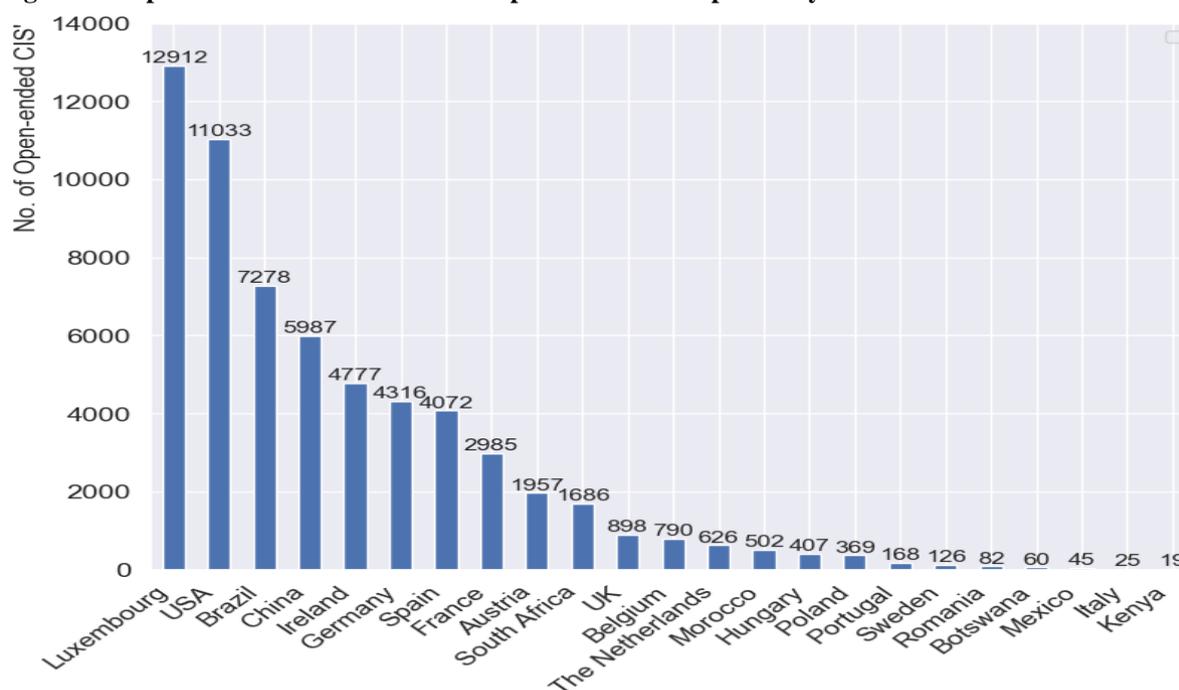
⁴⁶ For an example of such an analysis, please see: Aragon,G.O; Ergun,T; Getmansky,M, and Girardi,G (2017): “Hedge Fund Liquidity Management”, https://www.sec.gov/dera/staff-papers/working-papers/aragon-ergun-getmansky-girardi_HF-Liquidity-Management

Chapter 4 – Open-ended Funds Industry Analysis

4.1 The Global Open-ended Funds Industry⁴⁷

This chapter presents selected metrics related to the global OEFs industry. As at 31st December 2020, the number of OEFs captured by this exercise equals 61,120 funds. The US and Luxembourg account for over one-third of the funds captured for this exercise as many other jurisdictions with large funds industries do not currently have reporting requirements in place which would facilitate NCAs to participate in the exercise. For European countries, most jurisdictions currently only have reporting requirements for OEFs that would fall within the scope of the AIFMD reporting. Very few European jurisdictions, thus far, have implemented reporting requirements for UCITS funds. Hence, Figure 15 reflects only a partial picture of jurisdictions' OEFs industry and is not representative of the actual number of funds in the regulatory purview of European regulators. Also, for the US OEFs, differences in the mapping of data fields captured on Form N-PORT to the data fields in the pre-defined template developed by IOSCO, including data fields relevant to OEF liquidity, result in only a partial picture of liquidity analysis within the OEF industry.

Figure 15: Open-ended Funds - Number of open-ended CIS reported by Jurisdiction 2020



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) Figures for Belgium, Luxembourg and Spain include both UCITS and AIFs funds registered in their respective jurisdictions. Luxembourg UCITS funds represent 10,544 funds, while the remainder, 2,368 are reporting AIF's; 2) The currently available statistics/reporting for UCITS (other than Belgium and Spain) does not have the same data collection structure as AIFMD report requirements. Hence, more generally, reporting by European jurisdiction reflects data captured under AIFMD reporting requirements and therefore does not provide for a representative picture of the actual existing number of OEFs in the respective European jurisdictions.

⁴⁷

Unless mentioned with a specific caveat, the data underpinning the analysis in this chapter are sourced from the following jurisdictions: USA (SEC), Brazil, China, Ireland, Luxembourg, UK, France, Germany, The Netherlands, Spain, Italy, Belgium, Austria, Hungary, Poland, Sweden, Romania, Morocco, South Africa, Botswana and Kenya.

4.2 Assets Under Management and Investment Strategy

Total AuM for the OEFs sample captured by the survey is \$US43 trillion. When compared to other data sources, this figure is slightly lower (for example, see Bloomberg which reports global AuM of OEFs at \$US 66.67 trillion and data from the IIFA suggests global AuM of OEFs at \$US 64.6tril) but this is in line with the evolving nature of data collection for OEFs at national level.⁴⁸ As some jurisdictions undertake their domestic legislative changes to collect data on their domestic industries, either for the first time or to extend for missing coverage (e.g. the extension to UCITS in most European jurisdictions), in the coming years we expect this number to increase and be more representative of the global industry.

Figure 16 provides a breakdown of the most common investment strategies utilised by OEFs. Overall, equity and fixed income funds make up over two thirds of global AuM, which is perhaps unsurprising as, in many jurisdictions, OEFs will be subject to eligible asset rules preventing them from investing significant amounts of their AuM into more illiquid asset classes.

Figure 16: Open-ended Funds - Top investment strategies by Assets under Management



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: The above figure does not include US OEF data and most European UCITS data (except for Luxembourg, Belgium and Spain).

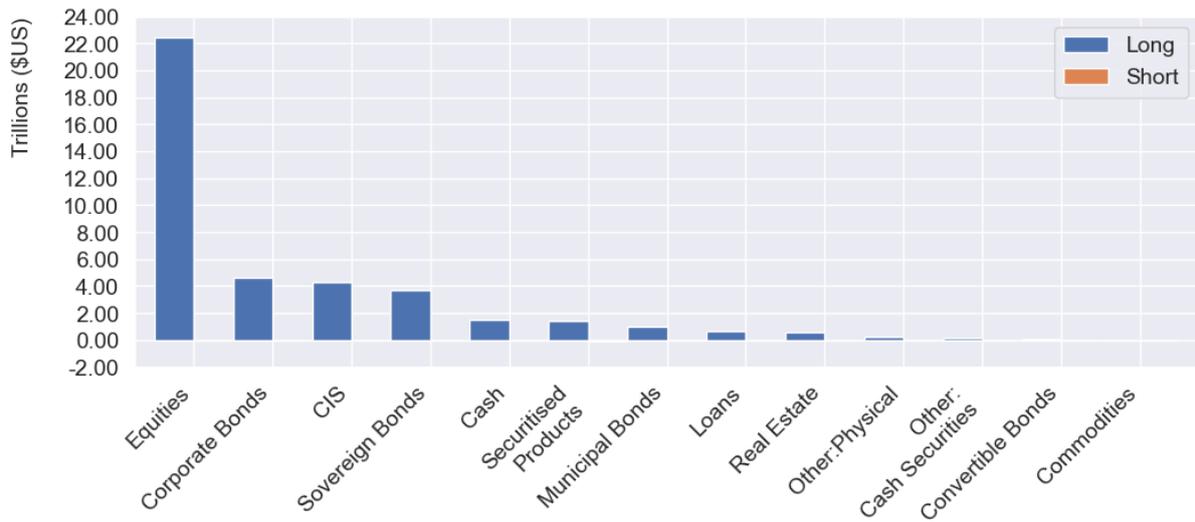
4.3 Investment Exposure

Equity holdings, both cash and derivatives, represent the largest holdings by OEFs. Figure 17 and Figure 19 highlight that the vast majority of AuM are physically held as cash securities. Very few short positions in cash securities are held by OEFs. Additionally, Figure 18 and Figure 20 highlight the use of derivatives by OEFs, which is limited, as many OEFs will be subject to leverage limits.⁴⁹

⁴⁸ Bloomberg figures as at 13th July 2021; IIFA figures as Q4 2020.

⁴⁹ In EU, limitation of leverage is attached to the type of fund (AIF vs. UCITS) but not attached to whether it is open-ended or close-ended.

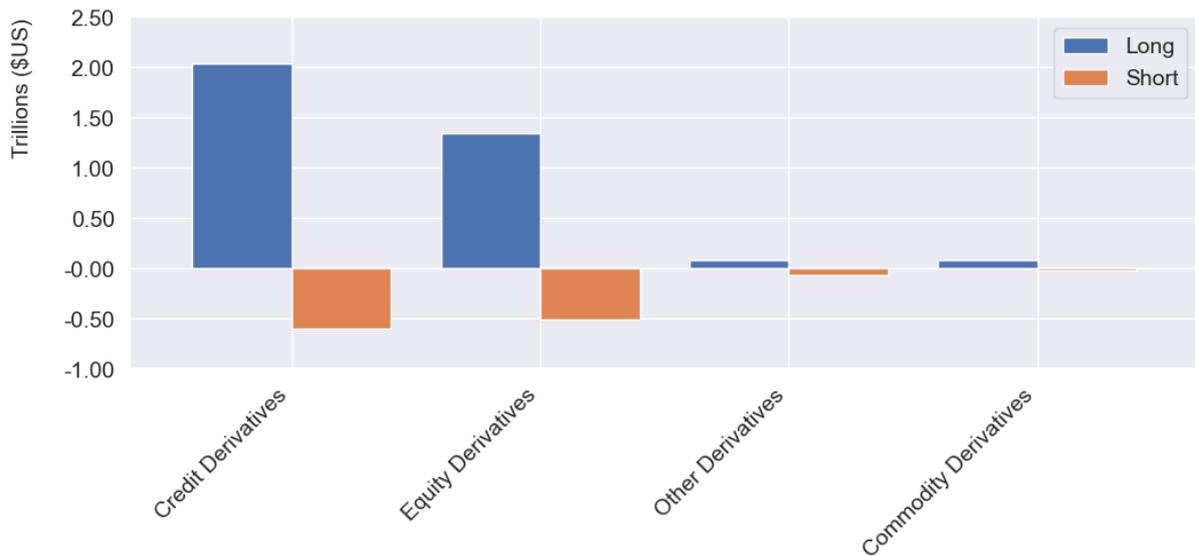
Figure 17: Open-ended Funds - Cash/Physical Securities - Long and Short Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) EU data used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

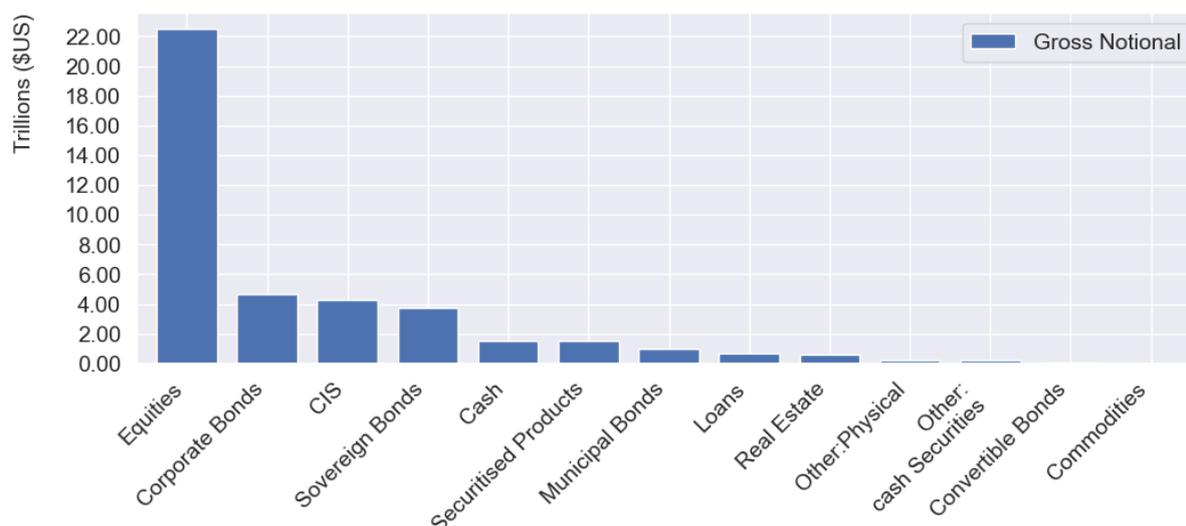
Figure 18: Open-ended Funds - Derivatives - Long and Short Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) EU data used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

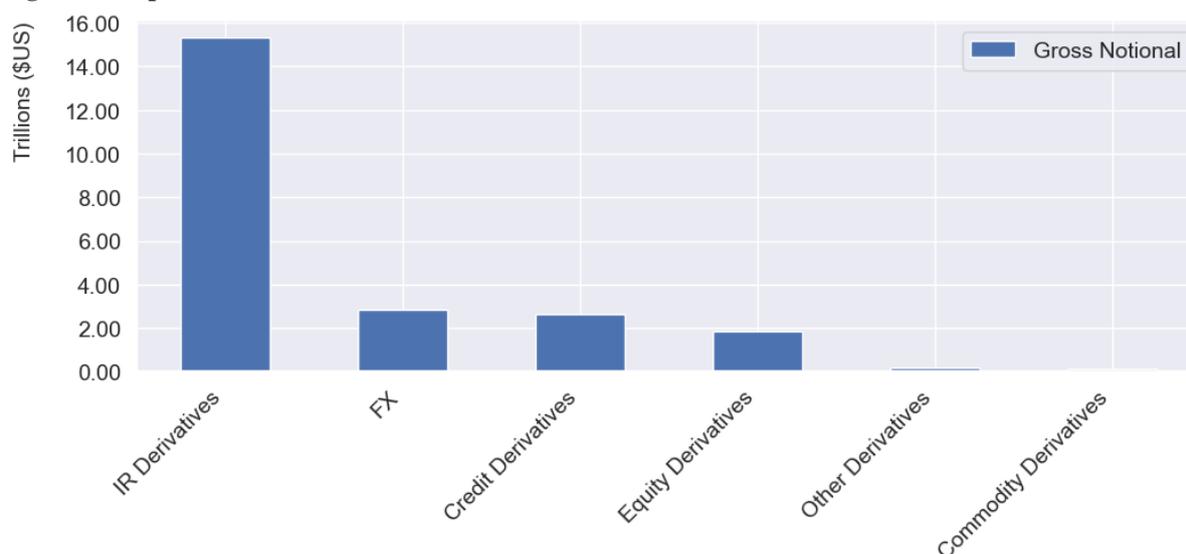
Figure 19: Open-ended Funds - Cash Securities - Gross Market Exposure



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) EU data used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

Figure 20: Open-ended Funds - Derivatives - Gross Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) EU data used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

Asset Class Breakdown

An asset class breakdown provides the percentage of a core set of investment exposures typical of an investment fund. Table 4 presents such a breakdown using the data collected for this exercise for the reported OEFs. The exercise conducted in Table 4 highlights these funds are mostly long-only physical equities, thereby exhibiting little leverage. Additionally, they also exhibit positive long only balances in bonds (both corporate and sovereign) and other collective investment schemes. There are very few short positions, in aggregate, held by reporting OEFs.

Table 4: Open-ended Funds - Market Exposure, broken down by asset class on a long/short basis

Asset Class	Long	Short	GNE without adj.*	Long (%NAV)	Short (%NAV)
Cash	\$ 1,496,086,401,618	\$ 43,380,367,109	\$ 1,539,466,768,727	3.92%	0.11%
Equities	\$ 22,434,654,848,626	\$ 28,811,237,448	\$ 22,463,466,086,075	58.81%	0.08%
Corporate Bonds	\$ 4,643,266,698,508	\$ 11,741,725,667	\$ 4,655,008,424,175	12.17%	0.03%
Sovereign Bonds	\$ 3,732,493,027,779	\$ 13,734,664,079	\$ 3,746,227,691,858	9.79%	0.04%
Municipal Bonds	\$ 978,086,122,102	\$ 6,045,489,581	\$ 984,131,611,683	2.56%	0.02%
Convertible Bonds	\$ 95,417,134,769	\$ 14,426,065	\$ 95,431,560,834	0.25%	0.00%
Securitised Products	\$ 1,439,812,471,076	\$ 65,886,355,455	\$ 1,505,698,826,530	3.77%	0.17%
Loans	\$ 635,894,469,259	\$ 17,310,494,287	\$ 653,204,963,547	1.67%	0.05%
Other: Cash Sec.	\$ 156,994,945,922	\$ 38,707,852,072	\$ 195,702,797,993	0.41%	0.10%
Real Estate	\$ 594,741,153,349	\$ 22,611,103	\$ 594,763,764,452	1.56%	0.00%
Commodities	\$ 12,350,478,413	\$ 145,456,584	\$ 12,495,934,997	0.03%	0.00%
CIS	\$ 4,282,457,627,951	\$ 1 749 598 039	\$ 4,284,207,225,989	11.23%	0.00%
Other: Physical	\$ 238 609 274 704	\$ 5 900 691 039	\$ 244 509 965 743	0.63%	0.02%
Equity Derivatives	\$ 1,345,168,212,431	\$ 501 351 702 488	\$ 1 846 519 914 918	3.53%	1.31%
Credit Derivatives	\$ 2,037,574,915,644	\$ 602,657,525,460	\$ 2,640,232,441,104	5.34%	1.58%
Commodity Derivatives	\$ 81,400,675,110	\$ 19,067,869,609	\$ 100,468,544,719	0.21%	0.05%
Other Derivatives	\$ 87,225,763,851	\$ 66,889,540,518	\$ 154,115,304,369	0.23%	0.18%
Foreign Exchange**			\$ 2,862,490,839,589		
IR Derivatives**			\$ 15,327,206,344,691		

Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) * GNE without adj: This metric represents the gross market exposure of a fund calculated by the absolute values of the notional amounts of a fund's derivatives and the value of the fund's other investments; 2) ** indicates that data was collected on a gross notional basis only. Long short split is not available. 3) EU data used in the compilation of this table are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

4.4 Leverage

Table 5 presents the selected leverage metrics, in line with those used in the previous chapter. Overall, the table suggests a few important messages. First, by any leverage metric, OEFs are not highly leveraged. For example, gross leverage, with or without FX and IR derivatives, is slightly above 1x NAV. On a net basis, where long positions are offset against short positions within the same asset class, the level of leverage is 1.12x. Second, when looking at the gross leverage figure in conjunction with the net leverage figure, the small difference implies that OEFs' exposure is mainly to physical assets, so it cannot be interpreted as anything close to leverage. Finally, the same difference also implies that the small amount of derivatives exposures taken on by OEFs are largely used for hedging purposes. Nevertheless, even where the positions are used for hedging purposes, they may create risks in times of stress (e.g. unexpected margin calls).

Table 5: Leverage in Open-ended Funds – Selected metrics⁵⁰

Leverage Metrics	
Gross Leverage <i>(including interest rate and FX derivatives)</i>	1.68
Gross Leverage <i>(excluding interest rate and FX derivatives)</i>	1.2
Net Leverage <i>(excluding interest rate and FX derivatives)</i>	1.12
Synthetic Leverage	0.60
Net Synthetic Leverage	0.12
Financial Leverage*	0.04

Source: IOSCO Investment Funds Statistics Survey, 2020

Note: 1) The NAV denominator has been adjusted downwards to reflect AIFs AuM reported by participating European jurisdictions. The AuM of Belgian and Spanish UCITS funds are included as part of this denominator; 2) * The Financial Leverage figure attributed to OEFs is calculated by excluding the NAV of those jurisdictions that did not report aggregate secured or unsecured borrowings. As such, for this metric, the denominator (i.e., the NAV) is adjusted to exclude US, Mexico, Austria, Hungary, South Africa and Kenya.

Financial Leverage

In many jurisdictions, OEFs are allowed to borrow. However, generally speaking, the level is limited, usually as a small multiple of NAV. For example, European UCITS may be authorised to borrow, so long as the amount does not exceed 10% of the funds' assets or 10% of the value of the fund.⁵¹ In the U.S., Section 18 under the Investment Company Act of 1940, prohibits an open-ended fund from issuing or selling an "senior security," other than borrowing from a bank (subject to a requirement to maintain 300% asset coverage).⁵²

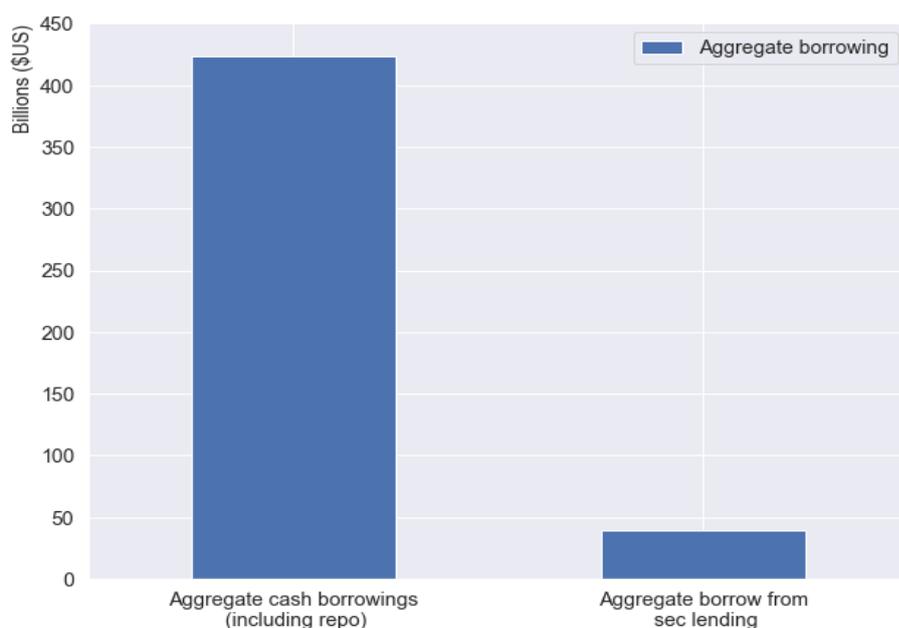
⁵⁰ For definitions, see footnote 40

⁵¹ See: <https://www.esma.europa.eu/databases-library/interactive-single-rulebook/clone-ucits/article-83>

⁵² "Asset coverage" of a class of senior securities representing indebtedness of an issuer generally is defined in section 18(h) of the Investment Company Act as "the ratio which the value of the total assets of such issuer, less all liabilities and indebtedness not represented by senior securities, bears to the aggregate amount of senior securities representing indebtedness of such issuer." Take, for example, an open-end fund with \$100 in assets and with no liabilities or senior securities outstanding. The fund could, while maintaining the required coverage of 300% of the value of its assets, borrow an additional \$50 from a

When considering all types of OEFs, the “Financial Leverage” metric in Table 5 above, in conjunction with Figure 21 below, shows the level of borrowings by OEFs. Overall, OEFs cannot be considered users of secured or unsecured credit, as these funds have an aggregate financial leverage ratio close to zero. As such, total borrowings represent a trivial amount in terms of the total NAV of OEFs. Of the amount that OEFs do borrow, most is unsecured in nature, as measured by the difference between the two columns in Figure 21.

Figure 21: Open-ended Funds - Borrowing Risk - Secured and unsecured borrowing (2020)



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) The above figure does not include data from the US, Mexico, Austria, Hungary, South Africa and Kenya. 2) Other EU data used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only, with the exception of Belgian and Spanish data which also captures UCITS.

4.5 Collateral, Unencumbered Cash and Cleared trades

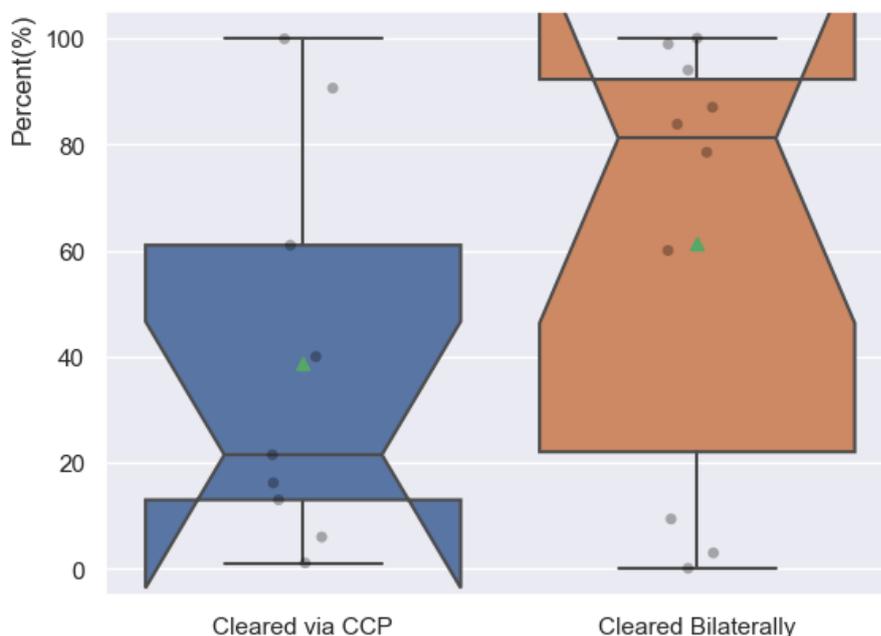
Overall, OEFs across the sample indicated that they had posted a total of \$US78.5 billion as collateral. This figure, when viewed in conjunction with the amount of secured borrowings presented in Figure 21 (\$US 39 billion), suggests that OEFs, in aggregate are over-collateralised. However, the same caveats as mentioned in the hedge funds chapter apply, “collateral”, in this context, includes collateral posted for initial and variation margin. Additionally, reported unencumbered cash was \$US563 billion, which implies a cash ratio of 0.03. IOSCO would need more granular data to be able to form a view as to the potential risks posed by liquidity preparation for margin calls; an area where data is likely to improve in future iterations of the report as national jurisdictions review their national frameworks.

Figure 22 highlights the distribution of centrally cleared trades by OEFs. Overall, more trades are cleared bilaterally than through CCPs, with 80% being the median level of trading cleared

bank. The \$50 in borrowings would represent one-third of the fund’s \$150 in total assets, measured after the borrowing (or 50% of the fund’s \$100 net assets)

bilaterally. This may in part be explained by the fact FX, which is used for hedging purposes by OEFs, is not subject to the obligation of central clearing.

Figure 22: Open-ended Funds - Distribution of trades cleared by CCP and Bilaterally (2020)



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) The above figure is interpreted similar to a traditional “box and whiskers plot” style chart, in that it highlights the following information: a) the high and low data points represented by the two horizontal lines at the end of the “whiskers”; b) the 25%, 50% and 75% quartiles, which are the bottom, middle and top lines in the coloured areas, respectively; c) the actual data captured (the shaded dots); and d) the mean as the green triangle 2) Distributions presented are based on jurisdictional-level data; 3) The above figure does not include data from the US, Ireland, Austria, Romania, Morocco, Kenya, South Africa and China; 4) Other EU data (except for Belgium and Spain whose UCITS funds are also captured) used in the compilation of this figure are based on data collected under the AIFMD reporting requirement only.

4.6 Liquidity

Effective liquidity risk management is important to safeguard the interests of investors in OEFs, maintain the orderliness and robustness of such funds and markets, and helps reduce systemic risk, all of which supports financial stability.

The issue of liquidity management in OEFs is currently the subject of a number of international workstreams. For example, IOSCO and the FSB have jointly undertaken analytical work on assessing liquidity risks and liquidity risk management in OEFs during the March 2020 Covid-19 induced market stresses (the “joint work”).⁵³

The joint work focused on issues related to OEF liquidity risk management, examining the experience of OEFs in March 2020 and the redemption pressures they faced through that narrow window.⁵⁴ In doing so, it focussed on registered mutual funds in the US, EU, Asia and elsewhere. Within this broad set, the joint work specifically analyses the types of OEFs that experienced greater redemption pressures and liquidity challenges during the March 2020

⁵³ The funds covered by this joint work were largely traditional mutual funds (e.g. UCITS in Europe and 40 Act in US fund equivalents) – the analysis did not cover MMFs, ETFs or hedge funds, which are subject to other studies.

⁵⁴ The joint work looked at a shorter timeframe (only the weeks leading up to and following March 2020).

market stress – exploring the availability and effectiveness of OEFs’ liquidity risk management tools (LMTs), and the degree to which the use of such tools mitigated redemption pressures.⁵⁵

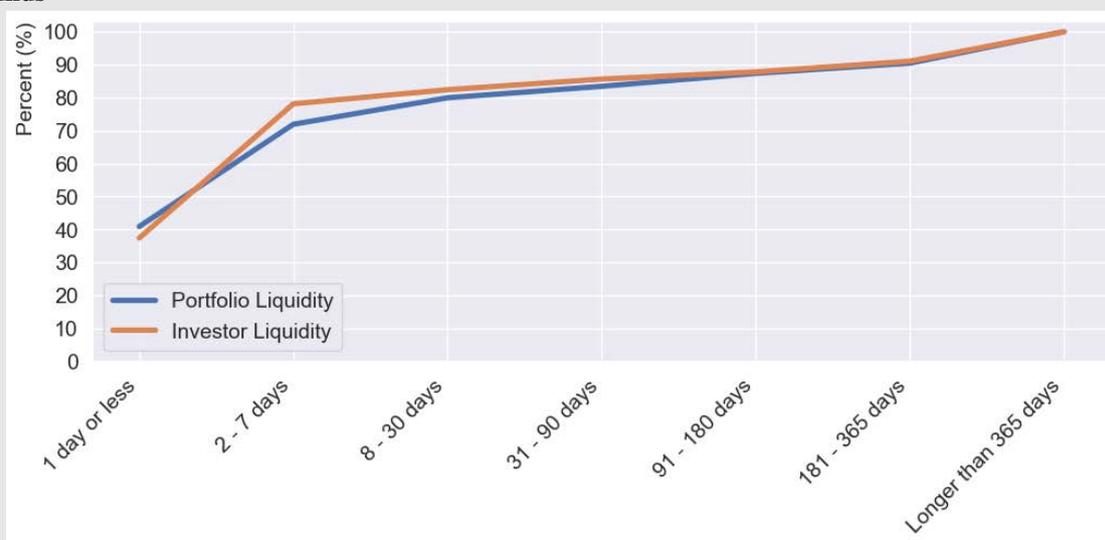
As pointed out earlier in this report, there are data collection areas that IOSCO expects will improve overtime and one such area is around liquidity profiles of OEFs. At this current juncture, a large proportion of the OEFs universe is not adequately captured by this report. As jurisdictions implement changes to their reporting framework, IOSCO expects to be able to conduct a more thorough analysis of liquidity across the OEF industry in the future. Box 2 presents a case study on the basis of data primarily collected via the European AIFMD framework, demonstrating the type of analysis we may be able to produce in a more fulsome manner in the future.

Box 2: Case Study – Fund and Investor Liquidity profile data reported to IOSCO

Figure 23 shows the aggregate OEF investor and portfolio liquidity profile for predominantly AIFs reported in this exercise. The chart is constructed on the basis of those jurisdictions that reported data for this particular data point, a list of which can be found in the footnotes of the chart. The chart shows us that, in aggregate, the liquidity offered to investors and portfolio liquidity roughly equate across the different time categories. This shows that in normal times, the liquidity management of the fund is closely aligned with the liquidity offered to investors. Funds could, in aggregate, honour redemptions up to 40% of their NAV on a daily basis and up to 70% weekly.

As with the similar observation with hedge funds however, this is the aggregate figure looking at the industry position as a whole but should not be taken as the case for any particular fund or group of funds because liquidity is not transferable.

Figure 23: Open-ended Funds - Average Portfolio and Investor Liquidity Profile for Open-ended Funds



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) Average portfolio and investor liquidity figures are calculated by excluding the NAV of those jurisdictions that did not report such metrics in each time category. As such, for these metrics, the denominator (i.e. the NAV) is adjusted to exclude US, Ireland, Austria, Romania, Morocco, Kenya, South Africa and China; 2) Hence, the data for the figure is based on submissions from Brazil, Luxembourg UK, France, Germany, The

⁵⁵ It further analysed the extent to which vulnerabilities concerning OEFs could have propagated shocks across the financial system or affected the provision of finance to the wider economy.

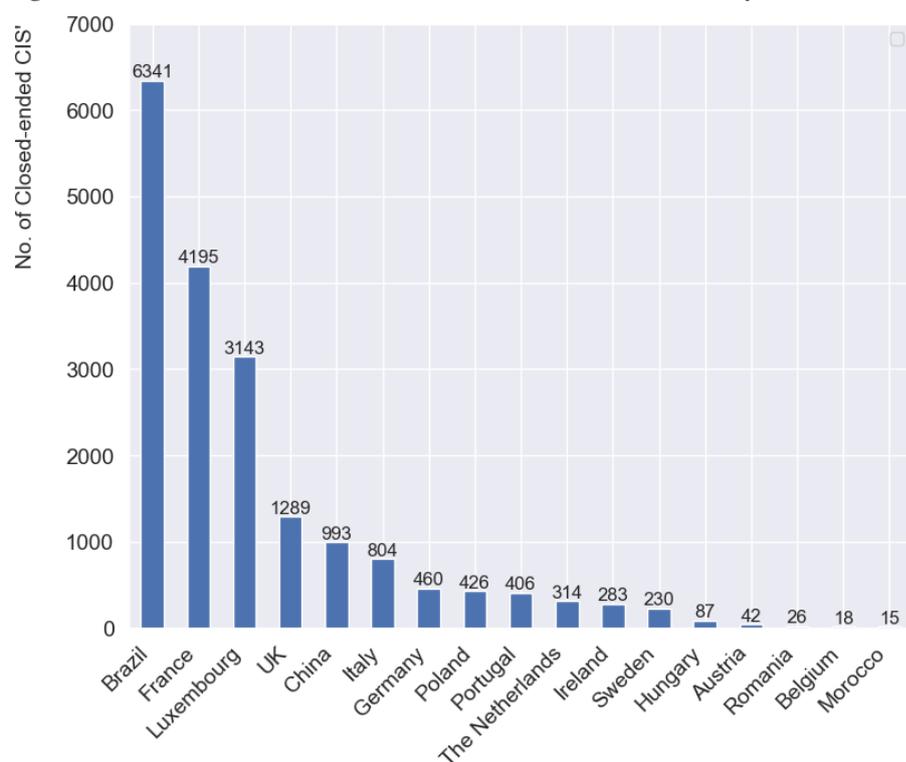
Netherlands, Spain, Italy, Belgium, Hungary, Poland, Sweden and Botswana; 3) Reporting by European jurisdictions reflects data captured under AIFMD reporting requirements only (except for Belgium and Spain, which includes both UCITS and AIFs) and therefore may not provide for a representative picture of the portfolio and investor liquidity profiles of OEFs in those respective European jurisdictions or elsewhere.

Chapter 5 – Closed-ended Funds Industry Analysis⁵⁶

5.1 The Global Closed-ended Funds Industry

The chapter presents selected metrics related to the global CEFs industry. As of 31st December 2020, the number of CEFs captured by this exercise was 19,072 funds. Brazil, France and Luxembourg accounting for over 50% of the total, however, we do not have comprehensive coverage from all fund jurisdictions and, hence, the descriptions below do not provide for the full picture across all jurisdictions (only reported scope). Similar to our data on OEFs, we expect these numbers to rise over time as more jurisdictions develop their reporting requirements.

Figure 24: Closed-ended Funds - Number of closed-ended CIS' by Jurisdiction (2020)



Source: IOSCO Investment Funds Statistics Survey, 2020

5.2 Assets Under Management and Investment Strategy

Total net AuM for the CEFs sample captured by the survey is \$US2.6 trillion. Given the current limitations associated with reporting requirements, it is difficult to identify in greater detail what the “other category” includes. Overtime, as reporting requirements in some national jurisdictions develops, IOSCO should be able to draw a more precise picture of the CEF sector.

Having said that, it is worth noting that real estate funds account for 22% of this sector. These types of funds will generally be designed as closed-ended, but their shares, in some

⁵⁶ Unless mentioned with a specific caveat, the data underpinning the analysis in this chapter are sourced from the following jurisdictions: Brazil, China, Ireland, Luxembourg, UK, France, Germany, The Netherlands, Italy, Belgium, Austria, Hungary, Poland, Sweden, Romania and Morocco.

jurisdictions, might be made available to trade on exchanges, thereby providing some liquidity for investors.

Private equity funds also account for 24% of the data received. Private equity funds generally remain closed for periods up to 10 years, segmented into an investment period and a harvesting period during which investments are being exited. They are typically organised as limited partnerships to which investors – generally referred to as limited partners – commit capital over the course of a fundraising process. By design, private equity funds do not offer redemption or liquidity mechanisms for investors and private equity investors typically invest with the expectation to commit till the end of the fund’s life. There are very limited avenues for investors to exit the fund prematurely.

Figure 25: Closed-ended Funds - Top investment strategies by Assets under Management

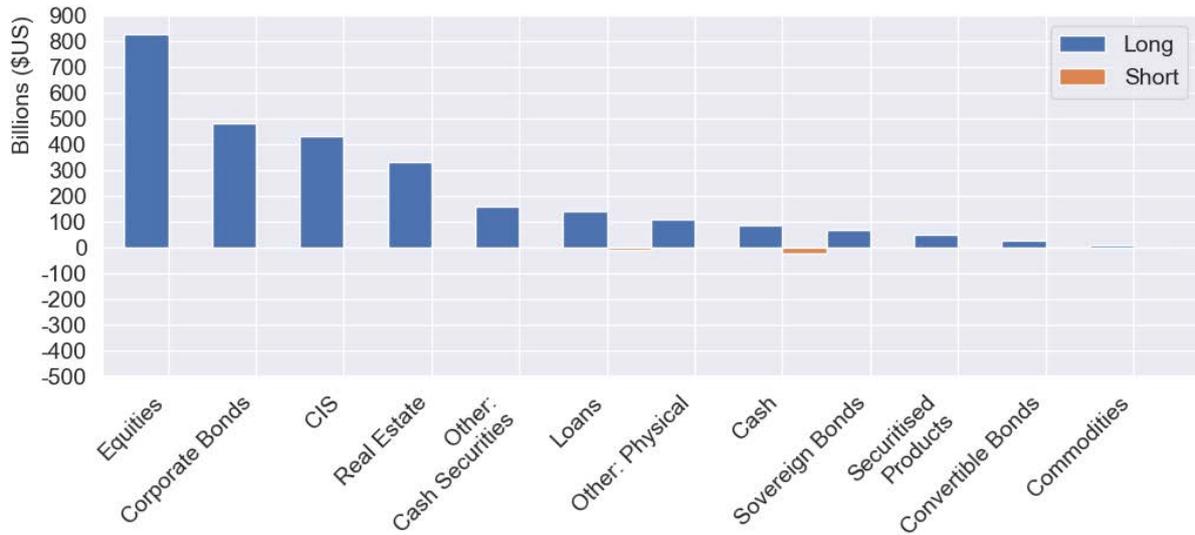


Source: IOSCO Investment Funds Statistics Survey, 2020

5.3 Investment Exposure

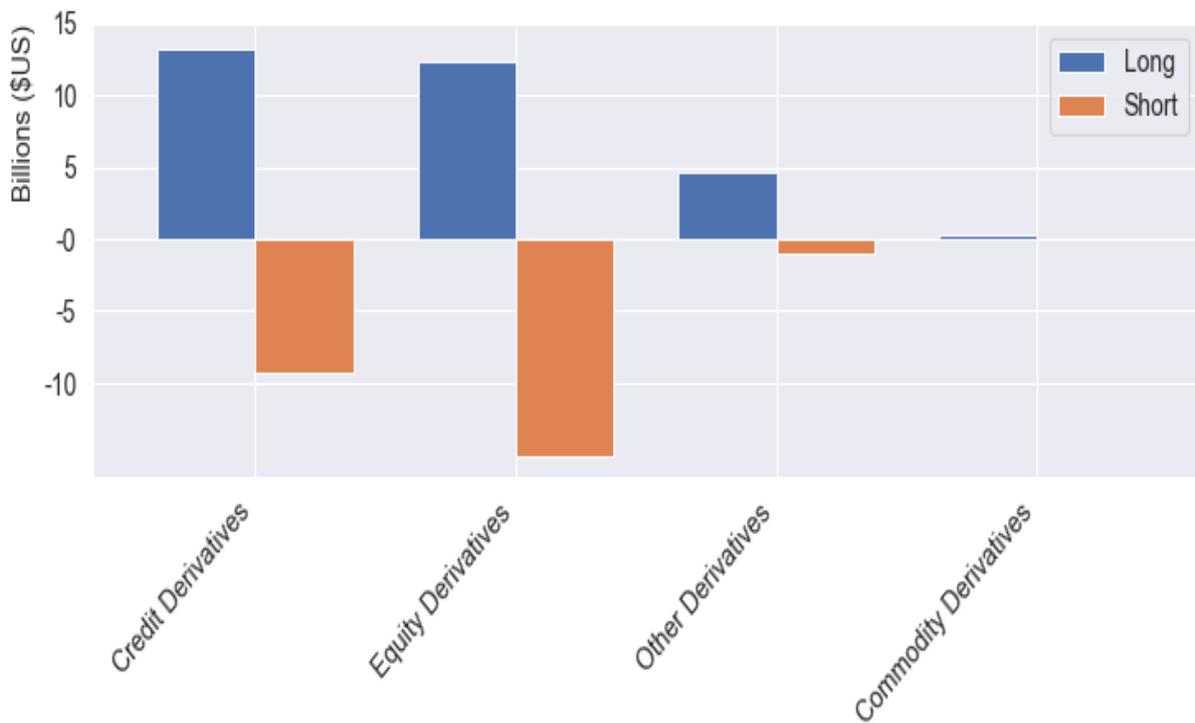
Equities, units in collective investment schemes, corporate bonds and real estate are the largest asset class exposure for CEFs. Figure 27 and Figure 29 highlight the use of derivatives by CEFs. Overall, closed ended funds, in aggregate do not have extensive exposures to derivatives, beyond the gross notional exposure to foreign exchange contracts, which are traditionally used to hedge FX risk.

Figure 26: Closed-ended Funds - Cash/Physical Securities - Long and Short Notional



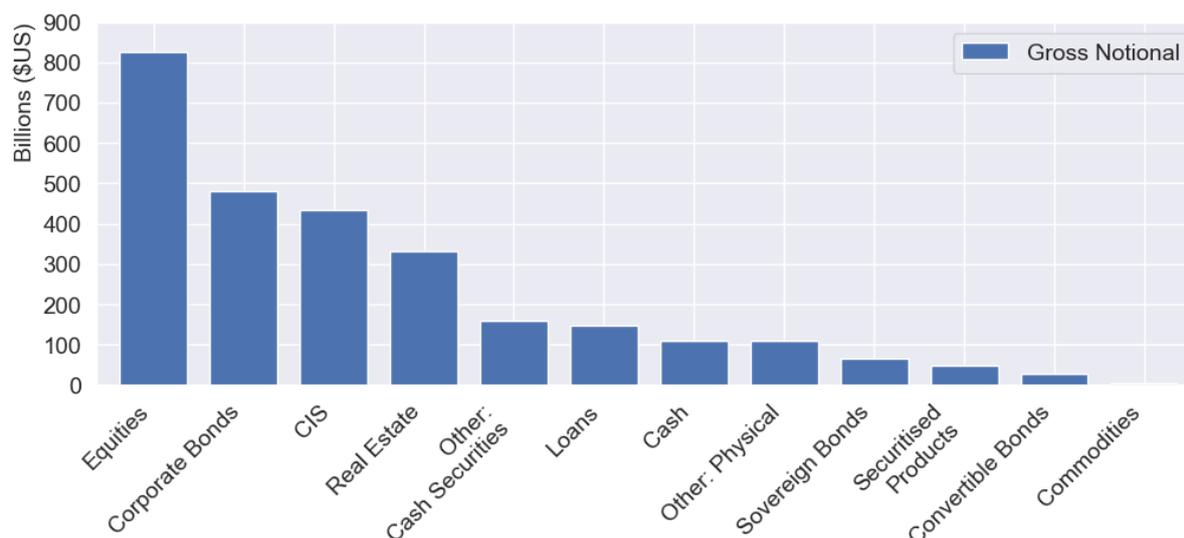
Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 27: Closed-ended Funds - Derivatives - Long and Short Notional



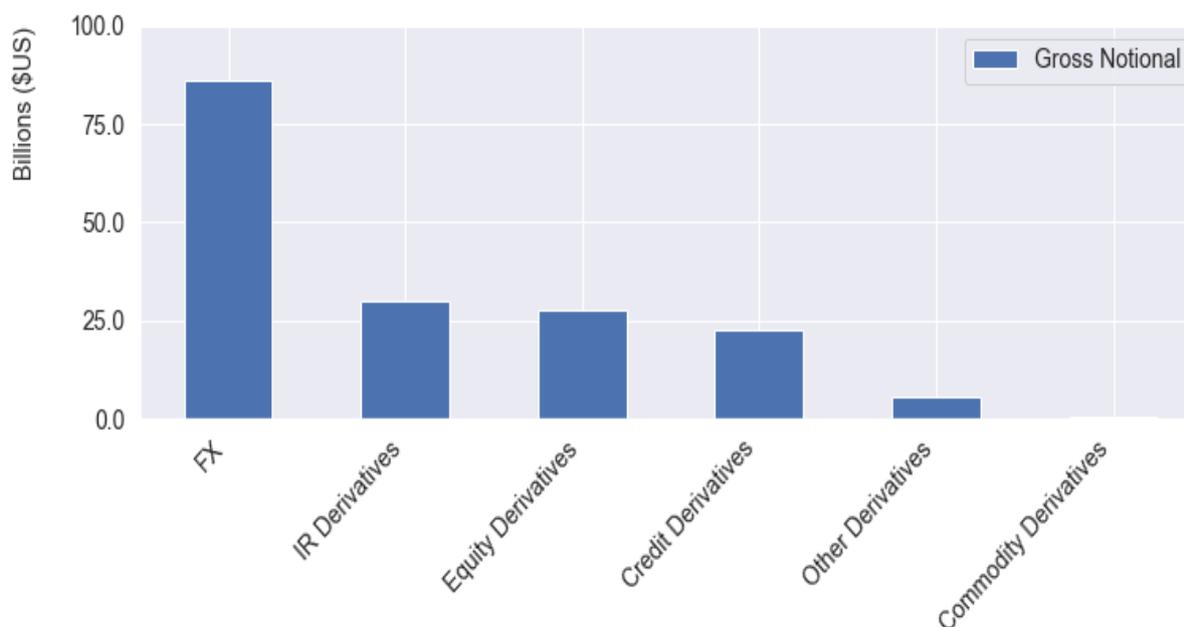
Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 28: Closed-ended Funds - Cash Securities - Gross Market Exposure



Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 29: Closed-ended Funds - Derivatives - Gross Notional



Source: IOSCO Investment Funds Statistics Survey, 2020

Asset Class Breakdown

As mentioned before, these metrics may not, in isolation, provide a good understanding of where the exposures are being built up. An asset class breakdown provides the percentage of a core set of investment exposures typical of an investment fund. Table 6 presents such a breakdown for data collected for CEFs. Of note are the long positions in physical asset classes such as equities, corporate bonds, real estate and other collective investment schemes. There is also a notable lack of short positions in most asset classes held by CEFs.

Table 6: Closed-ended Funds - Market Exposure, broken down by asset class on a long/short basis

Asset Class	Long	Short	GNE without adj.*	Long (%NAV)	Short (%NAV)
Cash	\$ 85,568,721,605	\$ 23,959,336,350	\$ 109,528,057,955	3.30%	0.92%
Equities	\$ 823,470,875,129	\$ 1,500,115,812	\$ 824,970,990,940	31.74%	0.06%
Corporate Bonds	\$ 481,899,067,113	\$ 372,034,036	\$ 482,271,101,149	18.57%	0.01%
Sovereign Bonds	\$ 64,307,747,370	\$ 328,614,351	\$ 64,636,361,721	2.48%	0.01%
Municipal Bonds	\$ 1,932,350,019	-	\$ 1,932,350,019	0.07%	0.00%
Convertible Bonds	\$ 27,393,586,651	\$ 251,366,377	\$ 27,644,953,028	1.06%	0.01%
Securitised Products	\$ 48,519,585,524	\$ 100,000	\$ 48,519,685,524	1.87%	0.00%
Loans	\$ 138,094,733,082	\$ 10,979,199,770	\$ 149,073,932,852	5.32%	0.42%
Other Cash Sec.	\$ 156,055,525,208	\$ 2,169,797,669	\$ 158,225,322,878	6.02%	0.08%
Real Estate	\$ 331,725,814,494	\$ 47,000,000	\$ 331,772,814,494	12.79%	0.00%
Commodities	\$ 5,803,042,055	-	\$ 5,803,042,055	0.22%	0.00%
CIS	\$ 430,716,461,898	\$ 2,582,359,192	\$ 433,298,821,090	16.60%	0.10%
Other Physical	\$ 106,682,572,276	\$ 1,723,049,786	\$ 108,405,622,062	4.11%	0.07%
Equity Derivatives	\$ 12,275,104,918	\$ 15,124,031,576	\$ 27,399,136,493	0.47%	0.58%
Credit Derivatives	\$ 13,237,651,299	\$ 9,344,591,982	\$ 22,582,243,281	0.51%	0.36%
Commodity Derivatives	\$ 239,087,683	\$ 800,000	\$ 239,887,683	0.01%	0.00%
Other Derivatives	\$ 4,655,401,473	\$ 1,009,184,024	\$ 5,664,585,497	0.18%	0.04%
Foreign Exchange*			\$ 85,988,126,253		
IR Derivatives*			\$ 30,009,855,210		

Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: * GNE Without Adj: This metric represents the gross market exposure of a fund calculated by the absolute values of the notional amounts of a fund's derivatives and the value of the fund's other investments; ** indicates that data was collected on a gross notional basis only. Long short split is not available.

5.4 Leverage

Table 5 presents the selected leverage metrics, in line with those used in the previous chapters. As with OEFs, overall, by any leverage metric, CEFs are not highly leveraged. Any “implied” leverage through gross notional amounts (1.12x) can be accounted for by taking in the use of FX and IR derivatives which are traditionally used as hedging products. For example, gross leverage, with or without FX and IR derivatives, is roughly 1x NAV. On a net basis, where long positions are offset against short positions within the same asset class, the level of leverage is negligible at 1x NAV. It should however be noted that private equity funds will typically use leverage, notably in leveraged buy-outs, with that leverage appearing on the balance sheet of the portfolio companies, not on the balance sheet of the fund. This level of detail is not currently available within jurisdictions’ reporting requirements, but could, depending on the level of debt, impact the underlying company itself which may not be able to service the debt.

Table 7: Leverage in Closed-ended Funds – Selected metrics⁵⁷

Leverage Metrics	
Gross Leverage (including interest rate and FX derivatives)	1.12
Gross Leverage (excluding interest rate and FX derivatives)	1.08
Net Leverage (excluding interest rate and FX derivatives)	1.03
Synthetic Leverage	0.07
Net Synthetic Leverage	0.02
Financial Leverage	0.07

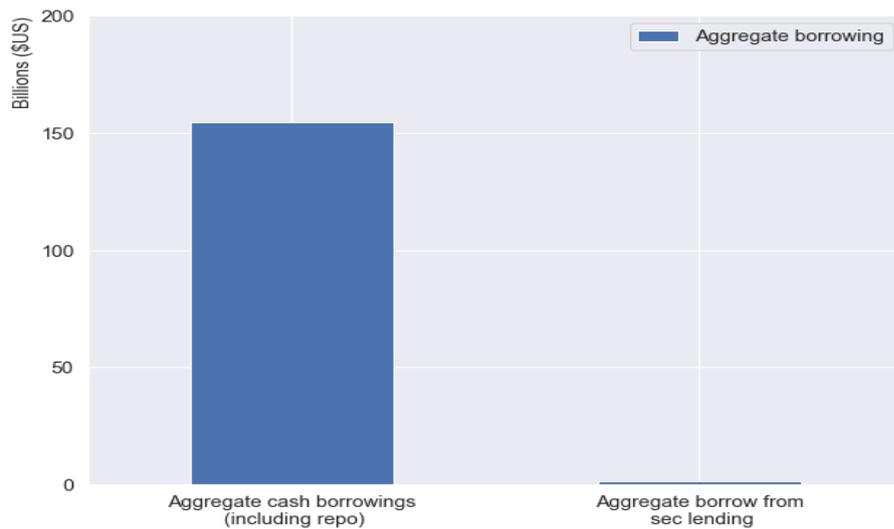
Source: IOSCO Investment Funds Statistics Survey, 2020

Financial Leverage

The “Financial Leverage” metric in Table 7 above, in conjunction with Figure 30, shows the level of borrowings by CEFs. Overall, CEFs do not borrow heavily, with a financial leverage ratio of close to zero. Most borrowing is unsecured in nature, as measured by the difference between the two columns in Figure 30. However, total borrowings represent a trivial amount in terms of total NAV of CEFs.

⁵⁷ For definitions, see footnote 40

Figure 30: Closed-ended Funds - Borrowing Risk - Secured and unsecured borrowing (2020)

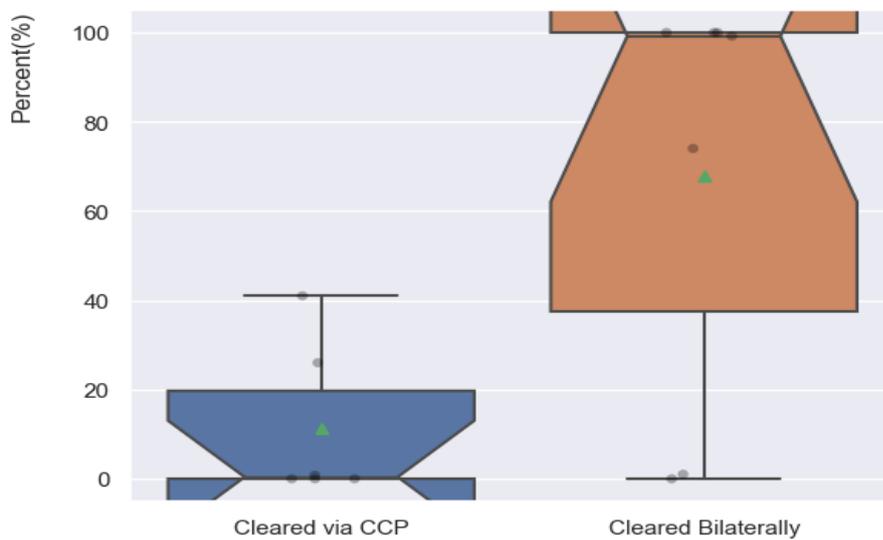


Source: IOSCO Investment Funds Statistics Survey, 2020

5.5 Collateral, Unencumbered Cash and Cleared trades

Overall, CEFs across the sample indicated that they had posted a total of \$US26.5 billion as collateral. Additionally, reported unencumbered cash of \$US89.5 billion, which implies a cash ratio of 0.03. Figure 31 highlights the distribution of centrally cleared trades by CEFs. Overall, more trades are cleared bilaterally than through CCPs. However, the sample size is small for this selected metric.

Figure 31: Closed-ended Funds - Distribution of trades cleared by CCP and Bilaterally (2020)



Source: IOSCO Investment Funds Statistics Survey, 2020

Notes: 1) Distributions presented are based on jurisdictional-level data

Chapter 6 – Regulatory developments at national/jurisdictional level with regards to data on investment funds

Europe

In Europe, the European Commission launched late 2020 a consultation regarding the review of the alternative investment fund manager directive (“AIFMD”, Directive 2011/61/EU)⁵⁸. As part of this consultation, the European Commission included notably questions on potential changes of the AIFMD reporting (such as on the possibility to collect data on an asset by asset class basis in order to assess leverage in AIFs pursuant to the IOSCO framework and on a possible harmonisation of the leverage calculation methods at EU level) as well as on the potential implementation of an EU supervisory reporting for UCITS by their managers. The latter is a response by the European Commission to a related ESRB recommendation to introduce such harmonised UCITS reporting within Europe.⁵⁹

Additionally, ESMA has published guidelines applying to national competent authorities to ensure the common, uniform and consistent application of Article 25 of the AIFMD.⁶⁰ In particular, those guidelines relate to the assessment of leverage-related systemic risk and aim to ensure that competent authorities adopt a consistent approach when assessing whether the condition for imposing leverage-related measures are met. They have been established to ensure consistent, efficient and effective supervisory practices within the European System for Financial Supervision and are deemed to be consistent with IOSCO 2019 Leverage Framework recommendations.

Kenya

a) Collective Investment Schemes regulations review and overhaul

The Capital Markets Authority of Kenya, through a consultancy support of Financial Sector Deepening Africa, is undertaking a review the Capital Markets (Collective Investment Schemes) Regulations, 2001 to make them more robust and facilitative to market dynamics. This is cognisant of the fact that the development of a strong asset management sector is critical to creating investor confidence that boosts deepening of the capital markets. A robust legal framework it will spur increased interest and participation by investors in Collective Investment Schemes’. The draft Regulations are still undergoing internal review and stakeholder consultation.

b) Guidance to Fund Managers of CISs on Valuation, Performance Measurement and Reporting (Guidance)

The Guidance was issued in September 2020 and took effect on 1 January 2021. The guidance is expected to entrench international best practice in the capital markets by standardising investment performance measurement and presentation by collective investment schemes.

⁵⁸ Financial services – review of EU rules on alternative investment fund managers (europa.eu)

⁵⁹ [Recommendation on leverage and liquidity in investment funds \(europa.eu\)](#)

⁶⁰ Article 25(1) of the AIFMD provides that Member States shall “ensure that the competent authorities of the home Member State of the AIFM use the information to be gathered under Article 24 for the purposes of identifying the extent to which the use of leverage contributes to the build-up of systemic risk in the financial system, risks of disorderly markets or risks to the long-term growth of the economy”.

Fund managers will be required to establish comprehensive, documented investment policies and procedures to govern the valuation of assets held by a CIS. The policies will identify the methodologies that will be used for valuing each type of asset and will clearly indicate how performance will be calculated, measured and presented. Fund managers will also be required to have policies and procedures in place to detect, prevent and correct pricing errors that result in material harm to CIS investors. The Guidance requires fund managers to provide performance measurement reports to the Authority and all existing and prospective investors, within 21 days after the end of each quarter.

Ontario (Canada)

Starting in 2021, the Ontario Securities Commission (OSC) launched an annual investment fund survey to collect data from investment fund managers registered in Ontario. This fund-level data collection will allow the OSC to compile detailed insights into the capital markets that the OSC oversees and regulates. In addition, the data gathered will allow for meaningful information sharing and interactions with regulatory partners, both domestically and internationally. The survey focuses on several areas, including leverage, liquidity and asset class exposures of investment funds. In particular, this survey seeks data points including, but not limited to fund size, type of holdings (by geography and asset class), leverage, and liquidity profiles.

United States

In late 2020, the SEC adopted new rules and rule and form amendments, designed to provide an updated, comprehensive approach to regulation of regulated funds' use of derivatives and certain other transactions. New rule 18f-4 under the Investment Company Act of 1940 ("Act") permits mutual funds (other than money market funds), ETFs, registered closed-end funds, and business development companies to enter into derivatives transactions and certain other transactions notwithstanding the restrictions under section 18 of the Act, where, among other things, such funds adopt derivatives risk management programs and comply with a limit on the amount of leverage-related risk the fund may obtain based on Value-at-risk. The new rule provides an exception for funds that are "limited" users of derivatives (i.e., derivatives exposure is limited to 10% of net assets).

Chapter 7 – Conclusion and areas for further improvement

This report presents the results of the first edition of the IOSCO Investment Funds Statistics exercise, which builds on many years of data collection expertise developed through the IOSCO Hedge Funds Survey report.

The survey will be an annual exercise that aims to provide IOSCO and interested stakeholders with a global view of the global investment funds industry and potential emerging risks from this sector.

Hedge funds

The Hedge Funds chapter builds upon five previous iterations of the IOSCO Hedge Funds Survey exercise. Overall, it indicates that the global hedge fund industry continues to grow in terms of the number of funds and assets under management. The strategies most employed by hedge funds globally are multi-strategy funds and equity long/short funds. The exposures of hedge funds confirm this result, with equities exposures (both cash securities and derivatives) being the largest positions held on a long/short basis. However, on a gross exposure basis, interest rate and FX derivatives continue to be the largest asset class positions held by hedge funds.

All of this has implications for the measure of leverage in funds. Depending on the metric, leverage may appear to have increased. At an aggregate level, there appears to be a considerable liquidity buffer, suggesting that in normal market conditions hedge funds should be able to meet investor redemptions. However, it is difficult to indicate whether this would remain the case under stress conditions, noting however that hedge funds have a broad range of liquidity management tools, including some not available to OEFs generally such as side pockets, to deal with liquidity pressures on the fund. Additionally, idiosyncratic, fund-level liquidity mismatches cannot be ruled out without more granular data, such as data obtained on portfolio performance and portfolio/investor liquidity needs through fund-level stress testing. NCAs, that have implemented stress-testing requirements on firms, should be able to consider whether these liquidity levels are appropriate at fund level. The consequences of the failure of individual funds could indeed have far-reaching consequences beyond the size of the funds (e.g. LTCM in 1998).

Open-ended funds

In contrast, figures from the analysis of OEFs data highlights several points of note. When compared to hedge funds, OEFs are not highly leveraged in terms of both gross notional derivatives use and financial leverage, even though the industry is 10 times larger (in terms of AuM) than the hedge funds industry. This reflects the fact there are generally regulatory requirements and limitations on some OEFs, which prevent them from using leverage above certain limits. As other data becomes available and provided by IOSCO members, future iterations of this report will look to develop further metrics of leverage, such as the ratio of unencumbered cash to margin posted. Such a metric will provide insights as to how much cash is on hand to meet margin calls, while also being a specific policy area of interest. To this point, the role of jurisdictions to monitor leverage risks at fund level is important. For this purpose, NCAs could deploy IOSCO's Leverage Framework in its "*Recommendations for a Framework Assessing Leverage in Investment Funds*" published in December 2019.

In terms of liquidity risk, future iterations of this report will present data when it becomes available.

Closed-ended funds

CEFs are uniquely different to those of hedge funds and OEFs. By their very nature of being “closed” to new subscriptions and redemptions, they do not exhibit the same liquidity risks as OEFs and, to a lesser extent, hedge funds. The data collection highlights some important points. First, closed-end funds hold large portions of their asset allocation in physical assets. Second, they are not highly leveraged. However, this picture possibly masks the role of leverage as undertaken through private equity, where the leverage is added to the balance sheet of the investee company. Depending on the level of leverage in those instances, there may be further consideration to be given to its potential impact on the real economy in times of crisis.

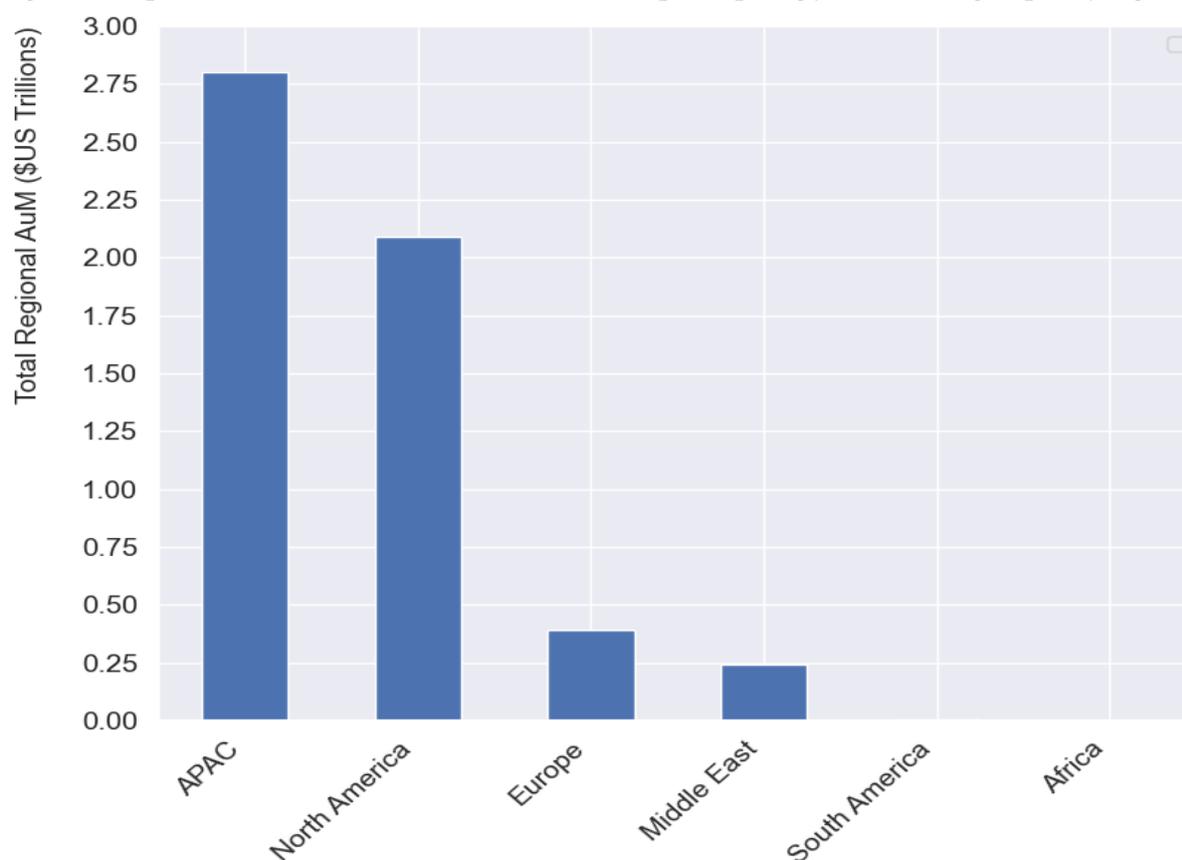
Appendix A – Opt-out Statistics⁶¹

Table 8: Opt-out statistics - List of Jurisdictions not participating in full data collection.

Jurisdictions		
Albania	Iran	Panama
Andorra	Isle of Man	Rwanda
Australia	Israel	Saudi Arabia
Bahrain	Korea, Republic of	Slovakia
Bulgaria	Latvia	Thailand
Canada	Lebanon	Turkey
Cyprus	Malaysia	UAE
Greece	Malta	
Guernsey	New Zealand	

Source: IOSCO Investment Funds Statistics Survey, 2020

Figure 32: Opt-out statistics - Breakdown of AuM of non-participating jurisdictions, grouped by region



Source: IOSCO Investment Funds Statistics Survey, 2020

⁶¹ Jurisdictions choosing to not participate in the survey's full data collection exercise have provided to IOSCO or otherwise made publicly available the total AuM of their domestic industry.

Appendix B – Fund-type Leverage Metrics by Jurisdiction⁶²

Table 9: Hedge Funds - Selected leverage metrics

Jurisdiction	No. of funds reported	AuM (\$US Millions)	Gross Leverage, including interest rate and FX derivatives	Gross Leverage, excluding interest rate and FX derivatives	Net Leverage, excluding interest rate and FX derivatives	Synthetic Leverage	Net Synthetic Leverage
Austria	4	90	11.73	7.96	4.69	10.86	3.81
France	75	10 914	3.78	3.75	0.65	3.18	0.11
Germany	8	4 917	1.01	1.01	1.01	0.00	0.00
Hong Kong	81	123 218	7.93	3.16	1.02	6.27	0.10
Ireland	23	28 887	4.57	1.75	1.35	3.15	0.13
Luxembourg	29	45 773	1.94	1.41	0.99	0.79	0.01
Poland	47	676	1.46	1.24	0.98	0.44	0.04
Singapore	41	104 617	13.70	9.36	2.15	9.34	0.89
Sweden	41	7 366	26.06	5.83	1.35	20.76	0.01
The Netherlands	24	2 438	14.25	5.77	1.55	11.75	0.69
United Kingdom	160	331 848	83.97	5.82	1.04	79.11	0.15
United States	1 780	3 401 000	6.56	4.14	0.96	3.11	0.04

Source: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Calculations

Note: 1) Participating jurisdictions apply different definitions of what constitutes a Hedge Fund. While some participating jurisdictions focused on "pure" hedge funds (i.e. those with no leverage restrictions), based on the declaration by the Asset Managers with no corrections. Other jurisdictions may have applied a different methodology. Hence, the figures are not necessarily comparable between jurisdictions; 2) among the reported data for French hedge funds, 10 out of the 75 are qualifying hedge funds, which represent 92% of the total AUM reported.

⁶² All data presented is sourced from the IOSCO Investment Funds Statistics Survey, 2020.

Table 10: Open-ended Funds – selected leverage metrics

Jurisdiction	No. of funds reported	AuM (\$US Billions)	Gross Leverage, including interest rate and FX derivatives	Gross Leverage, excluding interest rate and FX derivatives	Net Leverage, excluding interest rate and FX derivatives	Synthetic Leverage	Net Synthetic Leverage
Belgium	790	225	1.08	1.04	1.01	0.08	0.01
Botswana	60	2	0.29	0.29	0.27	0.00	0.00
Brazil	7 278	934	2.07	1.65	1.07	0.49	0.01
China	5 987	1 422	1.03	1.03	1.03	0.00	0.00
France	2 985	518	1.21	1.20	1.02	0.10	0.04
Germany	4 316	2 558	1.38	1.11	0.97	0.34	0.02
Hungary	407	20	2.10	2.10	1.34	0.56	0.08
Ireland	4 777	2 946	1.86	1.27	1.17	0.71	0.03
Italy	25	8	1.37	0.91	0.77	0.51	0.02
Kenya	19	105	1.00	1.00	1.00	0.00	0.00
Luxembourg	2 368	635	1.37	1.17	1.10	0.25	0.01
Mexico	45	16	1.29	1.27	1.01	0.02	0.00
Morocco	502	59	1.05	1.05	1.05	0.00	0.00
Poland	369	13	1.35	1.02	0.96	0.35	0.01
Portugal	168	23	1.11	1.11	1.02	0.04	0.02
Romania	82	5	1.06	1.06	1.06	0.00	0.00
Spain	4 072	376	1.22	1.09	1.04	0.23	0.05
Sweden	126	43	1.65	1.44	1.34	0.03	0.00
The Netherlands	626	977	1.31	1.15	1.10	0.24	0.05
United Kingdom	898	538	1.31	1.04	1.00	0.32	0.03
United States	11 033	26 477	1.79	1.26	1.17	0.68	0.09

Source: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Calculations

Notes: 1) Austria and South Africa provided total AuM figures and number of funds only for open-ended funds. Austria: AuM \$US246bil, No.of Funds 1957 South Africa: AuM: \$US215 bil No. of Funds 1686; 2) Underlying data for other European jurisdictions captures only those open-ended funds that are required to report via the AIFMD framework (except for Belgium and Spain, which includes both UCITS and AIF funds). As such, figures for European jurisdictions (excl. Belgium and Spain) do not reflect UCITS funds.

Table 11: Closed-ended Funds - Selected leverage metrics

Jurisdiction	No. of funds reported	AuM (\$US Billions)	Gross Leverage, including interest rate and FX derivatives	Gross Leverage, excluding interest rate and FX derivatives	Net Leverage, excluding interest rate and FX derivatives	Synthetic Leverage	Net Synthetic Leverage
Belgium	18	1	1.37	1.37	1.37	0.00	0.00
Brazil	6 341	221	1.09	1.04	0.98	0.06	0.00
China	993	439	1.18	1.18	1.18	0.00	0.00
France	4 195	548	1.06	1.06	0.97	0.03	0.00
Germany	460	33	1.22	1.22	1.13	0.00	0.00
Hungary	87	1	1.44	1.44	0.89	0.03	0.03
Ireland	283	63	1.53	1.47	1.32	0.34	0.13
Italy	804	103	1.11	1.11	1.10	0.01	0.01
Luxembourg	3 143	543	1.20	1.08	1.01	0.12	0.00
Poland	426	33	0.67	0.62	0.60	0.06	0.00
Portugal	406	15	1.46	1.46	1.01	0.01	0.01
Romania	26	0.4	1.00	1.00	1.00	0.00	0.00
Sweden	230	27	1.01	0.91	0.89	0.01	0.00
The Netherlands	314	128	1.02	1.01	1.01	0.00	0.00
UK	1 289	439	1.10	1.07	1.00	0.08	-0.01

Source: IOSCO Investment Funds Statistics Survey, 2020; IOSCO Calculations

Notes: 1) Austria and Morocco provided total AuM figures only for closed-ended funds Austria: AuM \$US1.1bill, No.of Funds 42 Morocco: AuM: \$US803mil No. of Funds 15; 2) Underlying data for European jurisdictions captures only those closed-ended funds that are required to report via the AIFMD framework. As such, figures in this table do not reflect UCITS funds; 3) Participating jurisdictions apply different definitions of what constitutes a closed-ended funds. As such, the figures are not necessarily comparable between jurisdictions.