

Investment Funds Statistics Report

The Board
of the
International Organization of Securities Commissions

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SUMMARY

Executive Summary

The Investment Funds Statistics Report (IFSR) is composed of survey submissions from IOSCO members and incorporates a broad range of market statistics to better understand and analyze the industry size, gross leverage, financial leverage, liquidity risk, and counterparty risk within hedge fund, open-ended fund, and closed-ended fund industries around the globe. The 2024 IFSR contains information from 28 IOSCO member jurisdictions for the 2022 reporting year and encompasses 99,722 funds representing USD 54.5T in global aggregate net asset value (NAV) and ~80%^[1] of the global investment funds industry.

The report contains data on qualified hedge funds (QHF), open-ended funds (OEF) and closed-ended funds (CEF), though reporting for OEFs and CEFs is limited in certain jurisdictions. The report builds off the 2020 IOSCO Report on Hedge Funds^[2] and incorporates data for OEFs and CEFs from 2020 onwards. The data contains Form PF and N-PORT filings in the United States (US), as well as data reported under the Alternative Investment Funds Managers Directive (AIFMD) in the European Union (EU) and the United Kingdom (UK). Additionally, Luxembourg, Italy, Spain, and Belgium provided data on Undertakings for Collective Investment in Transferable Securities (UCITS)^[3].

Overall, on an aggregate basis, both gross leverage and financial leverage remain low for OEFs and CEFs. Gross leverage for QHFs remains higher than pre COVID-19 levels, though it is trending downward, while financial leverage for QHFs remains low. Gross leverage for QHFs decreased 4.6%, while gross leverage for OEFs and CEFs has increased 13.5% and 5.7% respectively from the 2021 reporting year. Gross leverage stands at 10.3x NAV for QHFs, 2x NAV for OEFs and 1.11x NAV for CEFs. Further, decreased borrowing for QHFs and OEFs has led to declines in financial leverage of 45.4% for QHFs and 5% for OEFs. For CEFs, on an equivalent basis, borrowing has increased 7%, though financial leverage has fallen significantly by 76%. This may be a result of selection bias^[4]. Financial leverage stands at 0.95x NAV for QHFs, 0.0095x NAV (0.95%) for OEFs and 0.0356x NAV (3.56%) for CEFs.

In addition, based on the data collected, QHFs appear, in aggregate, to be able to meet investor liquidity demands under normal market conditions. However, the ability to meet investor liquidity demands may vary depending on the individual fund and their ability to manage liquidity.

Finally, although the level of bilateral transactions is high, exposure to counterparties on aggregate is low, and based on this data counterparty risk is low. However, for certain jurisdictions and fund types, counterparty risk may be high, though more data on margin and counterparty concentration is needed to adequately assess the risk for these jurisdictions.

[1] The percentage is calculated using Preqin's estimate for hedge funds as of September 2022 of USD 4.32T, ICI's estimate for OEFs as of Q4 2022 of USD 64.66T less USD 4.53T for funds-of-funds, and a comparative figure for CEFs of USD 4.05T using the percentage of total NAV for OEFs IOSCO has collected compared to global estimates and Preqin's 2021 estimates of Private Equity. In total, the above combined provides an estimate of the global investments funds industry to be USD 68.5T.

[2] See FR05/2020 Report on the Fifth IOSCO Hedge Funds Survey, Final Report, Report of the Board of IOSCO, April 2020, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD653.pdf>

[3] See Chapter 2 – Data and Methodology for more details on the EU fund reporting regimes.

[4] The decline in CEFs' financial leverage may be a result of the jurisdictions who have not submitted data for the 2022 reporting year but provided data for the 2021 reporting year, being more highly levered than the jurisdictions who have submitted responses for both reporting years.

Qualified Hedge Funds:

Equity strategies remained the dominant investment strategy by total aggregate NAV. The use of relative value strategies by QHFs make them an important market participant in the US Treasury (UST) Market, where they are very active in both sides of the market. Further, they also contribute to two-sided UST repo markets by using reverse repos to finance their holdings, and repos for investment purposes.

Sovereign Bonds, Listed Equities, Reverse Repos and Cash are the largest asset class exposures. The exposures to Sovereign Bonds and Reverse Repos are tied to QHFs' use of Relative Value strategies and financing in repo markets. Further, QHFs contribute to two-sided markets in both Canadian and European government bond markets.

Hedge funds are largely concentrated in the North American Markets. From the data provided, Luxembourg, Switzerland, Jersey, Germany, and the Netherlands are more diversified globally.

The UK hedge funds are highly leveraged in interest rate (IR) derivatives and there is evidence to show that these positions are primarily speculative. Overall exposure to IR and foreign exchange (FX) derivatives declined in 2022.

Borrowing and financial leverage fell significantly in 2022, while the cash ratio increased by 20% to 31% of total aggregate NAV. A trend of QHFs reducing asset exposures while increasing exposures to cash is observed.

Open-Ended Funds and Closed-Ended Funds:

When comparing jurisdictions who reported for both 2021 and 2022, there is an increase in the number of funds and decrease in total aggregate NAV for both OEFs and CEFs year-over-year.

- Decline in OEFs' aggregate NAV is driven by the US (-19%) and Luxembourg (-20%), as a result of declining asset prices and market conditions. Combined, the US and Luxembourg make up 66% of the total aggregate NAV for OEFs.
- Decline in CEFs' aggregate NAV is driven by France (-60%) following a widespread reclassification of funds^[5].

OEFs and CEFs have a large investment focus in Europe, in part due to the data received from mostly EU countries and lack of available data from the US. As with QHFs, European countries' OEFs and CEFs (except for France) were more diversified globally.

OEFs are primarily divided into Equity Funds and Fixed Income Funds, whereas CEFs are primarily Private Equity Funds.

OEFs' gross leverage is increasing largely due to increases in synthetic leverage. It is also important to note the potential for hidden leverage within CEFs due to the lack of reporting and disclosure transparency in private equity funds.

[4] The decline in CEFs' financial leverage may be a result of the jurisdictions who have not submitted data for the 2022 reporting year but provided data for the 2021 reporting year, being more highly levered than the jurisdictions who have submitted responses for both reporting years.

[5] The decline in France CEFs is a result of AIFMD data enhancements which allowed for better determination of whether a fund is closed- or open-ended. This led to a significant increase in the classification of open-ended funds that had previously been determined to be closed-ended.

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1. INTRO

Third Edition of the Investment Funds Statistics Report

This is the third edition of the Investment Funds Statistics Report (IFSR). The investment funds survey is comprised of three sections: qualified hedge funds, open-ended funds, and closed-ended funds. Each section collects aggregate information pertaining to the sectors leverage and risk over different asset categories, geographical areas, liquidity, and counterparty measures. The data is aggregated and analyzed to assess the industry size, gross leverage, financial leverage, liquidity risk, and counterparty risk within the respective industries.

In comparison to the previous iteration of the IFSR, a slight decrease is observed in both submissions and total NAV. When comparing with the metrics from the previous IFSR it is important to account for the fact that the overall number of contributions is less. The report will make reference to both the original comparison and an equivalent value comparison. The equivalent value takes into account jurisdictions which had previously submitted data for the 2021 reporting year but have opted not to submit for the 2022 reporting year.

It is also important to note that not all jurisdictions have submitted data for each fund type due to lack of available data or due to the fact that the fund type does not exist in that jurisdiction. Specifically, submissions from 11 jurisdictions were received pertaining to qualifying hedge funds, 22 jurisdictions pertaining to open-ended funds, and 17 jurisdictions pertaining to closed-ended funds. Smaller jurisdictions, where the impact on the report is relatively low, have only provided a total NAV for their respective jurisdictions^[6].

For each fund type, the impact from the changes in the data surveyed has been described in the fund overview. In total, the jurisdictions who did not submit data for the 2022 reporting year represented < 1% of QHFs' total aggregate NAV, < 2% of OEFs' total aggregate NAV, and < 2% of CEFs' total aggregate NAV from the 2021 reporting year. Thus, the impact on QHF, OEF, and CEF trends for the 2022 reporting year is low, due to the relative size of the jurisdictions who did not submit data for 2022 being small.

The report aims to provide an overview of leverage, liquidity and counterparty risk to understand risk and identify trends over time, however, changes in the data surveyed may impact the underlying trend when taken at face value. As the report grows, the analysis and identification of trends will further develop, and aid in better identification of size, leverage and risk throughout the global funds industries.

The following pages are broken down as follows. In Chapter 2 describes the data sources used in the study and the methodology of the calculations. Chapters 3, 4, and 5 provide an overview and analysis of the global QHF, OEF and CEF industries. Within chapters 3 to 5, each chapter includes subsections; subsection 1 describes the aggregate data, subsection 2 denotes the breakdown of the investment strategy or fund type, subsection 3 describes the funds' geographical investment focus, subsection 4 identifies the asset class exposures, subsection 5 identifies the derivatives class exposures, subsection 6 assesses the leverage measures, and subsection 7 denotes the counterparty risk and liquidity risk (for QHFs only^[7]). Chapter 6 summarizes and concludes the report.

[6] Please see Appendix 1 for a breakdown of the data received by jurisdiction.

[7] Liquidity risk data is not available for CEFs. For OEFs, the liquidity risk data collected may not be representative of the OEF industry as a whole.

2. DATA & METHOD

Data Sourced from IOSCO Investment Funds Survey

The data is sourced from IOSCO's investment funds survey which is sent to all IOSCO members and is submitted to IOSCO on a voluntary basis. Due to different reporting requirements in different jurisdictions, not all IOSCO members are able to contribute to the survey in its entirety^[8]. The data is cleaned and verified at the jurisdiction level and at an aggregate level. Data is collected in USD, and where applicable is converted from local currencies using the closing rate for the last business day of 2022. The data encompasses jurisdictions from around the world and makes use of different reporting requirements already in place, such as Form PF and N-PORT in the US and AIFMD and UCITS (for some jurisdictions) in the EU and the UK.

For the sections on leverage, gross leverage is defined per the 2019 IOSCO Recommendations for a Framework Assessing Leverage in Investment Funds^[9]; calculated as total aggregate market exposure^[10] over the total aggregate NAV. Gross notional exposure (GNE) is used in order to aggregate and compare leverage across jurisdictions and fund types. As noted in the 2019 report, GNE can overstate leverage for certain asset classes, therefore leverage is also calculated excluding IR and FX derivatives. Further, due to the aggregate nature of the survey, netting can only be done on an aggregate basis by asset class and not at the individual fund or underlying asset level. Without a more detailed calculation of netting, net notional exposure may not accurately reflect the net leverage and is excluded from the report.

In addition, synthetic leverage is defined as the total sum of the gross notional exposure of all derivatives over the total aggregate NAV, and financial leverage is defined as the total aggregate notional amount of cash and securities borrowings over the total aggregate NAV.

Hedge Funds:

The data for hedge funds is captured based on the following criteria:

1. The fund 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.
2. The fund is at least partially managed by a regulated entity within their jurisdiction or marketed in that jurisdiction.
3. The fund is managed by a single fund manager; funds-of-funds and multi-manager funds are excluded from the data.
4. The fund is able to demonstrate that they are a QHF, in that they manage at least USD 500M of total global aggregate net assets (aggregate 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.

[8] Due to this there may exist some selection bias, where only jurisdictions who are capable of reporting will contribute to the survey. However, as noted in the Executive Summary, the survey encompasses approximately 80% of the global investment funds industry by total aggregate NAV, and is therefore reflective of a significant proportion of the population.

[9] See FR18/2019 Recommendations for a Framework Assessing Leverage in Investment Funds, Final Report, Report of the Board of IOSCO, December 2019, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD645.pdf>

[10] Excluding cash and cash equivalents, as per the 2019 Recommendations for a Framework Assessing Leverage in Investment Funds, supra fn 8.

In some jurisdictions reporting is voluntary and subject to varying thresholds, however, the report has consistently captured the largest jurisdictions by total aggregate NAV and, therefore, has explanatory power capturing a majority of the hedge fund industry.

It is important to note that data collected in the US as a part of Form PF may contain QHFs who are managed outside the US but are required to register with the SEC. Due to the methodology and Form PF reporting capturing funds outside of the US, the data may be skewed towards the US and under-represent the true value in certain jurisdictions where these funds have been excluded.

Open-Ended and Closed-Ended Funds:

The National Competent Authority (NCA) reporting is 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, an NCA does not need to provide data from these funds but has been encouraged, where possible, to provide an estimate of the total NAV of these funds.

Collection of UCITS Funds Data

Box.1: Reporting requirements for UCITS funds.

There is currently no standardized reporting framework for UCITS at the EU level, meaning only a few EU jurisdictions receive UCITS data, based on their own national regulatory reporting requirements. As such, most EU jurisdictions taking part in this exercise have not provided granular-level data for UCITS. Unless specifically noted in the report, the European data presented in this analysis is based solely on data submitted through the AIFMD (Directive 2011/61/EU) 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. There are no rules on eligible assets and investment limits in the AIFMD framework, these rules are specified by national legislation. There is currently a review of AIFMD and UCITS Directive which foresees the creation of harmonized EU UCITS reporting. Under this proposal, all EU NCAs will receive data on UCITS periodically. The new Directives are expected to be adopted early 2024, and the revised AIFMD framework and new UCITS framework will be in place 5 to 6 years thereafter (at the earliest).

Collection of US Form N-PORT Data

Box.2: US data reporting for open-ended funds.

US data on open-ended mutual funds was collected through publicly available N-PORT filings located on the SEC's EDGAR database. The data used in this analysis is obtained from all N-PORT filings made to the SEC with a reporting date of either October 31st, November 30th or December 31st 2022 as registered funds may select different fiscal year-end reporting dates. To allow for data comparability, fund-level data obtained through this process is aggregated, in accordance with a pre-defined template developed by IOSCO. In instances where there is not a direct mapping, some discretion has been applied to identify the correct aggregation. In other instances, there may be no data directly available from the N-PORT database. Due to the lack of availability, the sections which do not include the US data have been noted.

On May 3, 2023, the U.S. Securities and Exchange Commission ("SEC" or "Commission") adopted amendments to Form PF, the confidential reporting form for certain SEC-registered investment advisers to private funds.

The amendments seek to improve the ability of the Financial Stability Oversight Council (FSOC) to assess systemic risk and to provide meaningful information to the Commission's oversight of private fund advisers and its investor protection efforts. Among other things, the amendments will require large hedge fund advisers and all private equity fund advisers to file reports upon the occurrence of certain reporting events that could indicate significant stress at a fund or implicate investor protection concerns. The amendments will also require large private equity fund advisers to report information on general partner and limited partner clawbacks on an annual basis as well as additional information on their strategies and borrowings as a part of their annual filing.

Additionally, on August 23, 2023, the Commission adopted new rules and rule amendments to enhance the regulation of private fund advisers and update the existing compliance rule that applies to all registered investment advisers. The final rules will require private fund advisers registered with the Commission to provide investors with quarterly statements detailing certain information regarding fund fees, expenses, and performance. In addition, the final rules will require a private fund adviser registered with the Commission to obtain and distribute to investors an annual financial statement audit of each private fund it advises and, in connection with an adviser-led secondary transaction, a fairness opinion or valuation opinion. The final rules will also prohibit all private fund advisers from providing investors with preferential treatment regarding redemptions and information about holdings or exposures, in each case, where the adviser reasonably expects the preferential treatment to have a material, negative effect on other investors. In all other cases of preferential treatment, the Commission adopted a disclosure-based exception to the proposed prohibition, including a requirement to provide certain specified disclosure regarding preferential terms to all current and prospective investors. In addition, the final rules will restrict certain other private fund adviser activity that is contrary to the public interest and the protection of investors.

3. HEDGE FUNDS

Leverage Remains Constant

In continuation of IOSCO's 2020 hedge fund survey, the IFSR aims to provide an overview and assessment of the leverage and trends within the hedge fund industry. The report looks at QHF data from IOSCO member submissions for December 31, 2022^[11] The survey encompasses data on 2,468 QHFs with a total NAV of USD 4.4T from 11 jurisdictions around the world.

Compared to the previous IFSR report, there is a slight decrease in submissions, with 11 of 15 jurisdictions from 2021 providing data on QHFs. As a result, the number of QHFs reported has fallen by 11%. When excluding the number of hedge funds from the jurisdictions that had provided data for 2021 but not 2022, there is a 2% decline in the number of hedge funds reported.

Similarly, the NAV for the 2022 reporting year has fallen 9.3% in comparison to the 2021 reporting year. Adjusting for the equivalent NAV, there is a 9% decrease in NAV for the 2022 reporting year. Thus, the jurisdictions who provided data for the 2021 reporting year and did not submit data for 2022, have little impact on the overall analysis.

The US represents approximately 83% of the total qualifying hedge funds reported on the survey and 86% of the total NAV. Because the US represents such a large proportion of the data received, the following graphs and analysis are highly influenced by the US data. Consequently, the decline in the US equity and bond markets^[12] contributed to the declines in QHFs' total aggregate NAV.

Overall gross leverage continues to decline since 2020, however, when interest rate (IR) and foreign exchange (FX) derivatives^[13] are excluded there is an increase in gross leverage year-over-year. While this increase in gross leverage (excluding IR and FX derivatives) seems significant, gross leverage (excluding IR and FX derivatives) remains lower than 2018 levels.

[11] The United States (SEC) data is submitted for September 31, 2022.

[12] Downturn in US stocks measured from the Wilshire 5000 Total Market Index. Downturn in US bonds measured from the S&P US Aggregate Bond Index.

[13] Gross Notional Exposure for Interest Rate and Foreign Exchange Derivatives may overstate funds exposure when not calculated on an equivalent basis. For more information, see CR08/2018 IOSCO Report: Leverage, Consultation Paper, Report of the Board of IOSCO, November 2018, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD615.pdf>

3.1 | Hedge Fund Aggregate Data

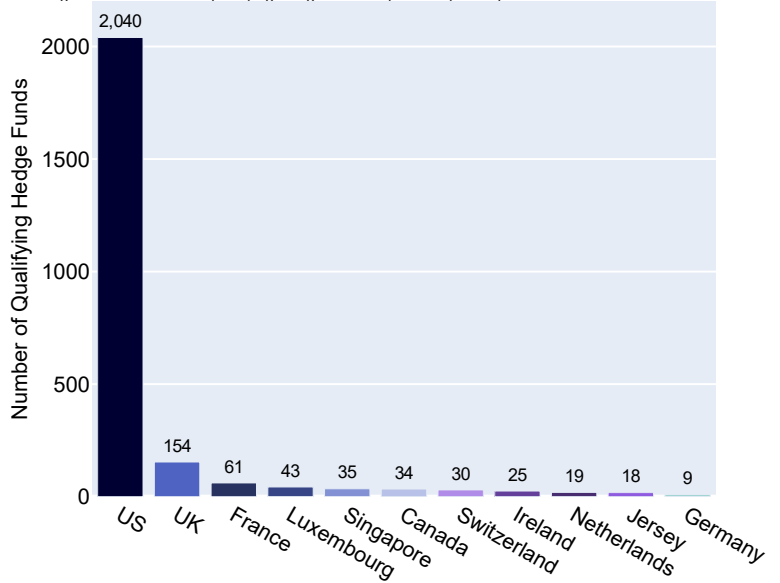
Total Qualifying Hedge Funds

Fig.1: Aggregate number of qualifying hedge funds reported by all jurisdictions for 2022.



Qualifying Hedge Funds by Jurisdiction

Fig.2: Total number of qualifying hedge funds reported by each jurisdiction for 2022.



Year-over-year comparison:

Total QHFs reported decreased by 11%. This is primarily a result of certain jurisdictions who had previously participated in the survey not responding to the survey for 2022. Looking at the top four jurisdictions (US, UK, France^[14], and Luxembourg) there is a slight increase in the number of hedge funds reported for the UK (+4) and Luxembourg (+4), whereas there is a slight decrease in the number of hedge funds reported for the US (-30) and France (-6). Overall, comparing the jurisdictions that have reported for both 2021 and 2022 reporting years there is a 2% decline in the number of QHFs.

Conversely, total aggregate NAV decreased by 9% from the 2021 reporting year and when taking into account the jurisdictions that had not reported for 2022, there is a similar decline in aggregate NAV. This is due to the decline in the US aggregate NAV from USD 4.18T to USD 3.77T. Only three jurisdictions saw increases; Switzerland, Luxembourg, and Jersey, while the remaining jurisdictions experienced significant declines in total aggregate NAV.

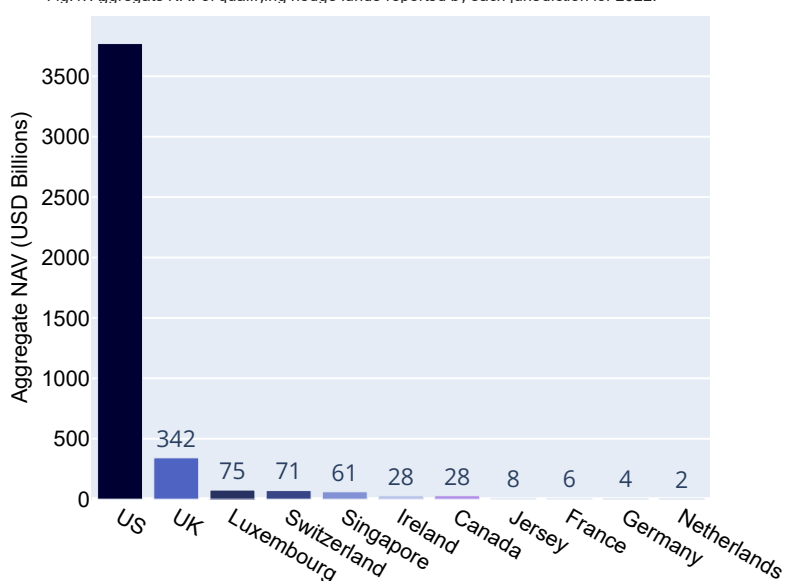
Total Aggregate NAV

Fig.3: Total aggregate NAV of qualifying hedge funds reported by all jurisdictions for 2022.



Aggregate NAV by Jurisdiction

Fig.4: Aggregate NAV of qualifying hedge funds reported by each jurisdiction for 2022.



[14] Only 2 of 61 hedge funds for France are qualified hedge funds, representing 37% of total aggregate NAV.

3.2 Hedge Fund Investment Strategy

Percentage of NAV by Investment Strategy

Fig.5: Aggregate NAV of qualified hedge funds as a percentage of total aggregate NAV broken down by investment strategy for 2022.

Investment Strategy

- Other
- Equity Hedge: Long / Short
- Macro
- Relative Value: Fixed Income Arbitrage
- Equity Hedge: Long Bias
- Credit Long / Short
- Event Driven: Distressed / Restructuring
- Credit Asset Based Lending
- Event Driven: Equity Special Solutions
- Event Driven: Risk Arbitrage / Merger Acquisition
- Relative Value: Convertible Bond Arbitrage
- Relative Value: Volatility Arbitrage
- Managed Futures / CTA: Quantitative
- Equity Hedge: Market Neutral
- Managed Futures / CTA: Fundamental
- Equity Hedge: Short Bias

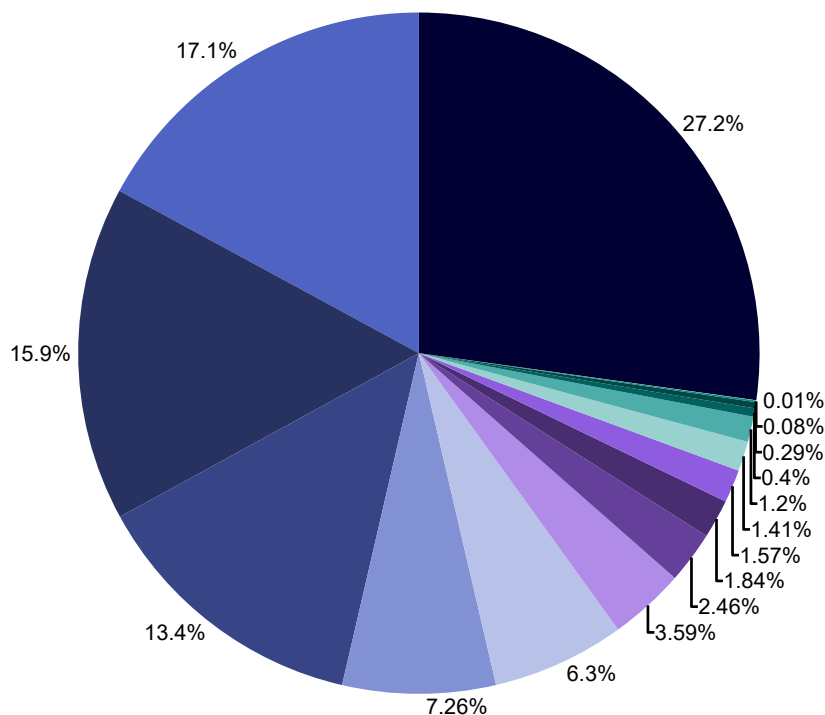


Figure 5 provides a breakdown of QHF investment strategies^[15]. From this graph, it is evident that around 70% of the total aggregate NAV is accounted for in just four strategies; Other, Equity Hedge: Long/Short, Macro, and Relative Value: Fixed Income Arbitrage, with more than half of the aggregate NAV being accounted for in the first three strategies respectively. Other may include a variety of strategies. When removing this category, Equity Hedge: Long/Short, Macro, Relative Value: Fixed Income Arbitrage, and Equity Hedge: Long Bias are the dominant single strategies of QHFs.

The “Other” investment strategy category is primarily driven by QHFs in the US, which encompassed a significant portion of the total NAV reported by investment strategy^[16]. In totality, as seen in previous years, equity strategies (Long/Short, Long Bias, and Market Neutral) remain the dominant investment strategies by total NAV for QHFs.

Importance of Qualified Hedge Funds in the US Treasury Market

Box.1: Federal Reserve findings on qualified hedge fund concentration in the US Treasury market.

It is important to note the role and concentration that QHFs play in the US treasuries market. The Federal Reserve found that the 85% of the gross UST exposure was held by less than 3% of QHFs in 2020^[17]. Moreover, the Federal Reserve notes the interconnectedness with other markets through the use of relative-value strategies, whereby, hedge funds link UST cash and futures through on/off the run arbitrage (fixed income arbitrage – primarily sovereign), UST cash/futures basis trades, and swap spread arbitrage. Hedge funds’ use of these strategies also plays a significant role in two-sided UST repo markets by using reverse repos to finance their holdings and repos for investment purposes.

[15] Please note, as a result of multi-strategy being accounted for through each investment strategy type, the category has been removed for the 2024 IFSR. The remaining percentage of total aggregate NAV has been allocated to the Other category to more closely reflect the breakdown in the SEC report on “Private Fund Statistics” (see fn 10). Some jurisdictions still have multi-strategy funds for which there is no breakdown available by investment strategy category. For these funds, the amount that is identified as “Multi-Strategy” has been allocated to the Other category. For the 2022 reporting year the total aggregate NAV of the “Multi-Strategy” funds represents 2.18% of total aggregate NAV.

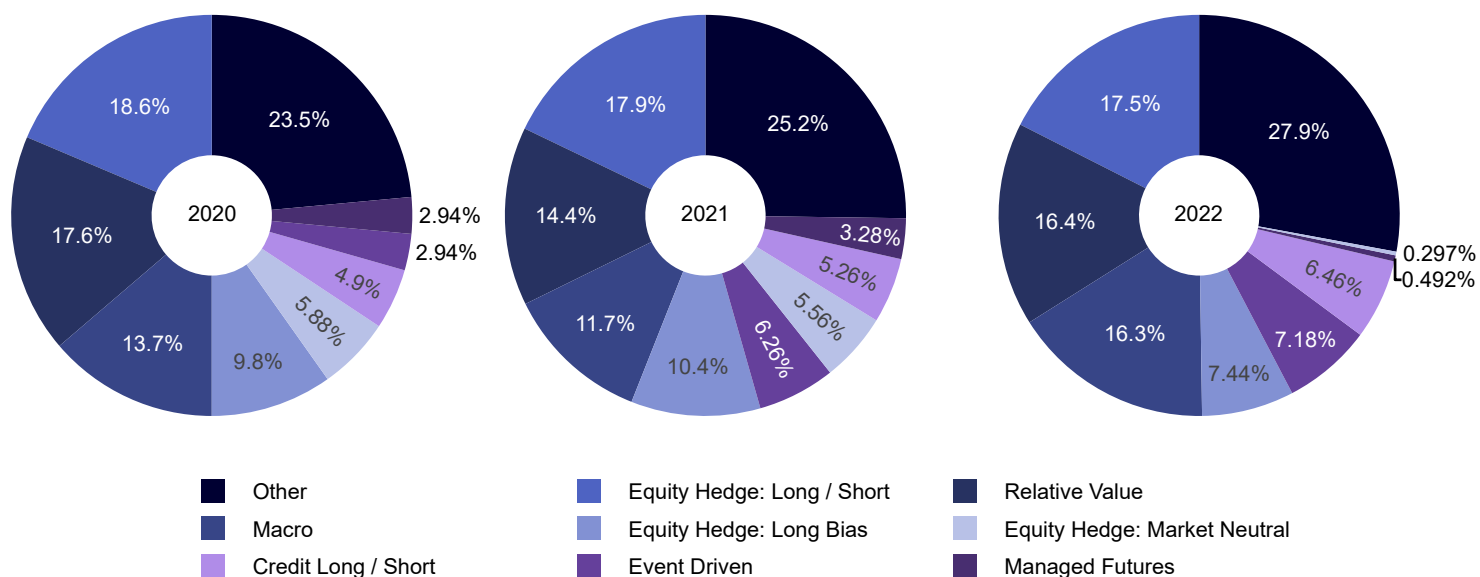
[16] See the SEC staff report on “Private Funds Statistics”, SEC Division of Investment Management, April 2023, available at: <https://www.sec.gov/files/investment/private-funds-statistics-2022-q4.pdf>

[17] See the Federal Reserve note on “Sizing hedge funds’ Treasury market activities and holdings”, October 2021, available at: <https://www.federalreserve.gov/econres/notes/feds-notes/sizing-hedge-funds-treasury-market-activities-and-holdings-20211006.html>

Investment Strategy: Year-Over-Year Comparison

Fig.6: Year-over-year comparison of the aggregate NAV as a percentage of total aggregate NAV of qualified hedge funds broken down by investment strategy.

Note: Relative Value, Event Driven, and Managed Futures strategies have been rolled up into one category for comparison of the following graphs.



Year-over-year comparison:

The dominant strategies for QHFs remain Other, Equity Hedge: Long/Short, Relative Value and Macro. Compared to the 2021 reporting years, Other, Relative Value and Macro strategies have experienced increases in percentage of total aggregate NAV, increasing 2.7%, 2% and 4.6% respectively. Conversely, Equity Hedge: Market Neutral, Equity Hedge: Long Bias, and Managed Futures strategies have experienced decreases in percentage of total aggregate NAV, decreasing 5.3%, 3% and 2.8% respectively.

Of note, Event Driven strategies remain high compared to the 2020 reporting period, and experienced a slight year-over-year increase in percentage of total aggregate NAV.

3.3 Hedge Fund Geographical Investment Area

Total NAV by Geographical Investment Area

Fig.7: Total aggregate NAV of qualified hedge funds broken down by geographical investment area for 2022.

Note: Of the 11 jurisdictions who provided qualified hedge fund data only 10 jurisdictions provided data pertaining to the geographical investment area.

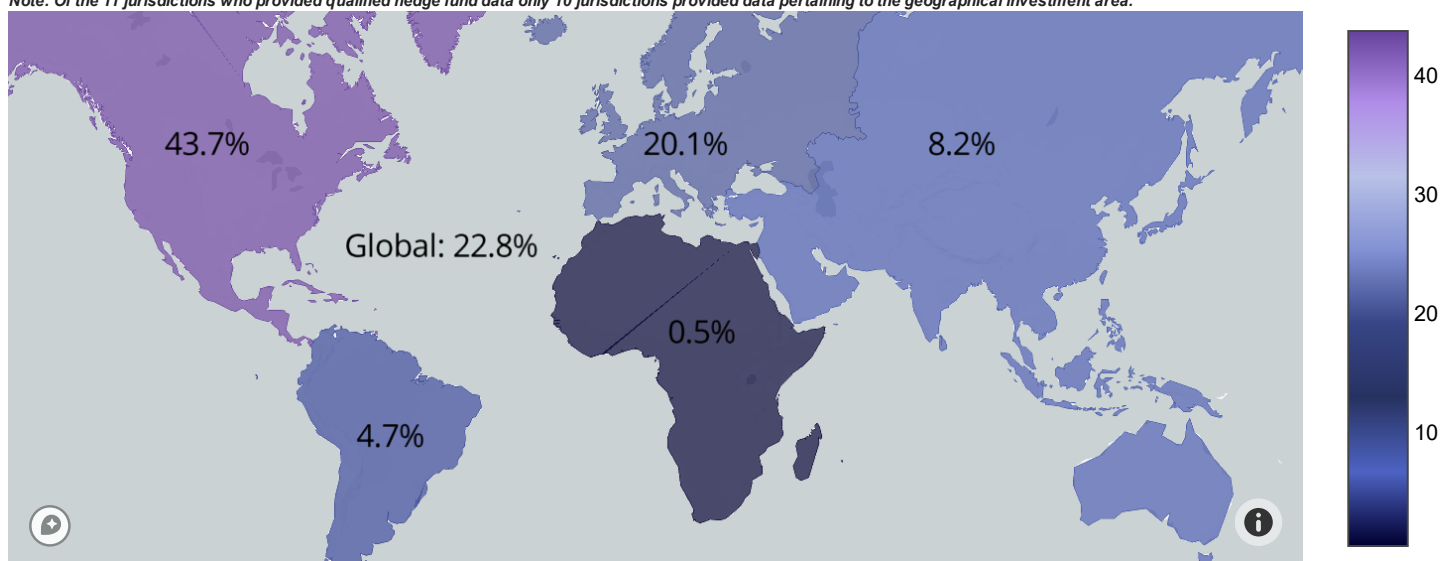
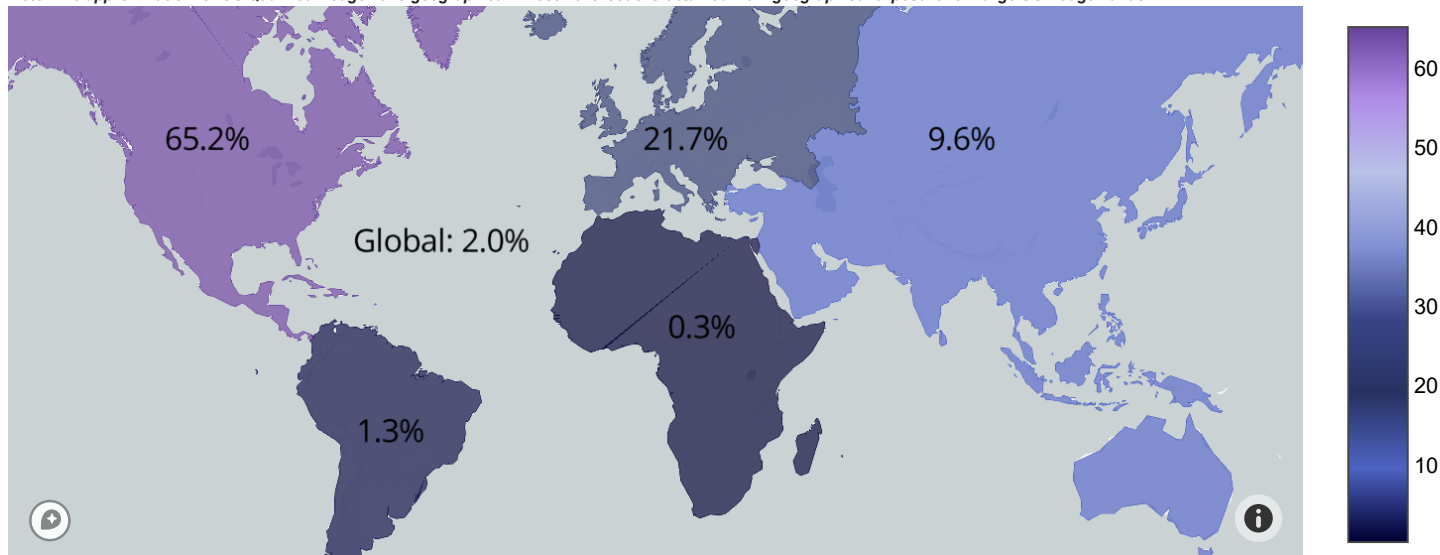


Figure 7 provides a breakdown of the QHF's geographical investment focus, excluding the US QHFs due to lack of available data. The breakdown provided therefore only represents approximately 15% of the total aggregate NAV. Excluding the US, most of the QHF's investment focus is distributed within North America, followed by Europe and Global (no specific investment area focus).

Total NAV by Geographical Investment Area (w/ US Approximation)

Fig.8: Total aggregate NAV broken down by geographical investment area including an approximation of the US geographical investment focus based on US Large HFs for 2022.

Note: The approximation for US Qualified Hedge Fund geographical investment focus is obtained from geographical exposure for Large US Hedge Funds.

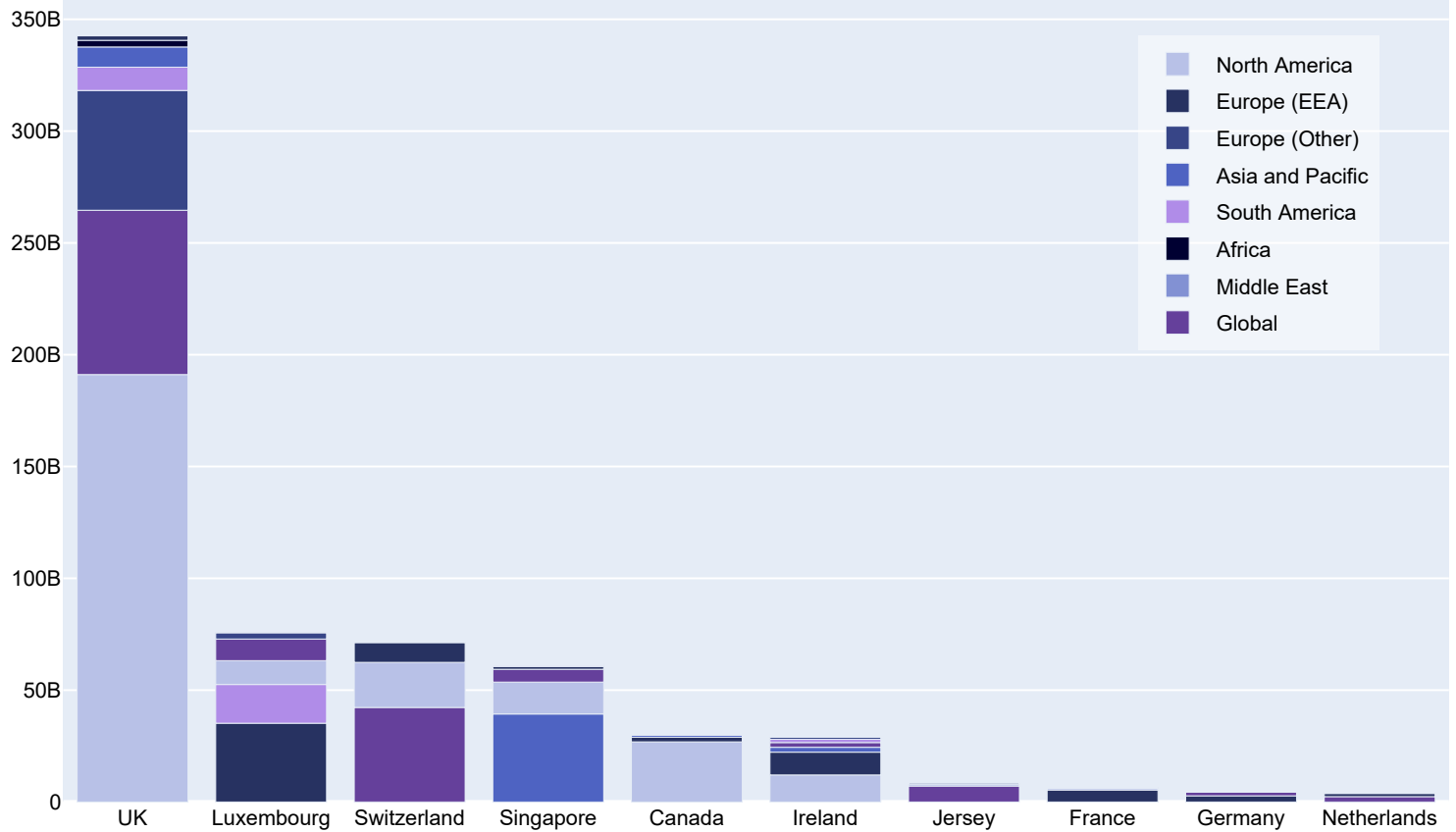


As an approximation for qualified hedge funds in the US, the percentage of geographical region exposure for Large Hedge Funds^[18] is used. Figure 8 includes the approximation for the US. Including this data, about 65% of the investment is focused on North America, 22% of the investment focus is in Europe, and 9.5% of the investment is in Asia and Pacific (including the Middle East). Overall, this shows that QHF's investments are highly concentrated in the North American market.

[18] See the SEC report on "Private Funds Statistics", April 2023, supra fn 13

Total NAV by Geographical Investment Area and Jurisdiction

Fig.9: Total aggregate NAV of qualified hedge funds broken down by geographical investment area by each jurisdiction for 2022.

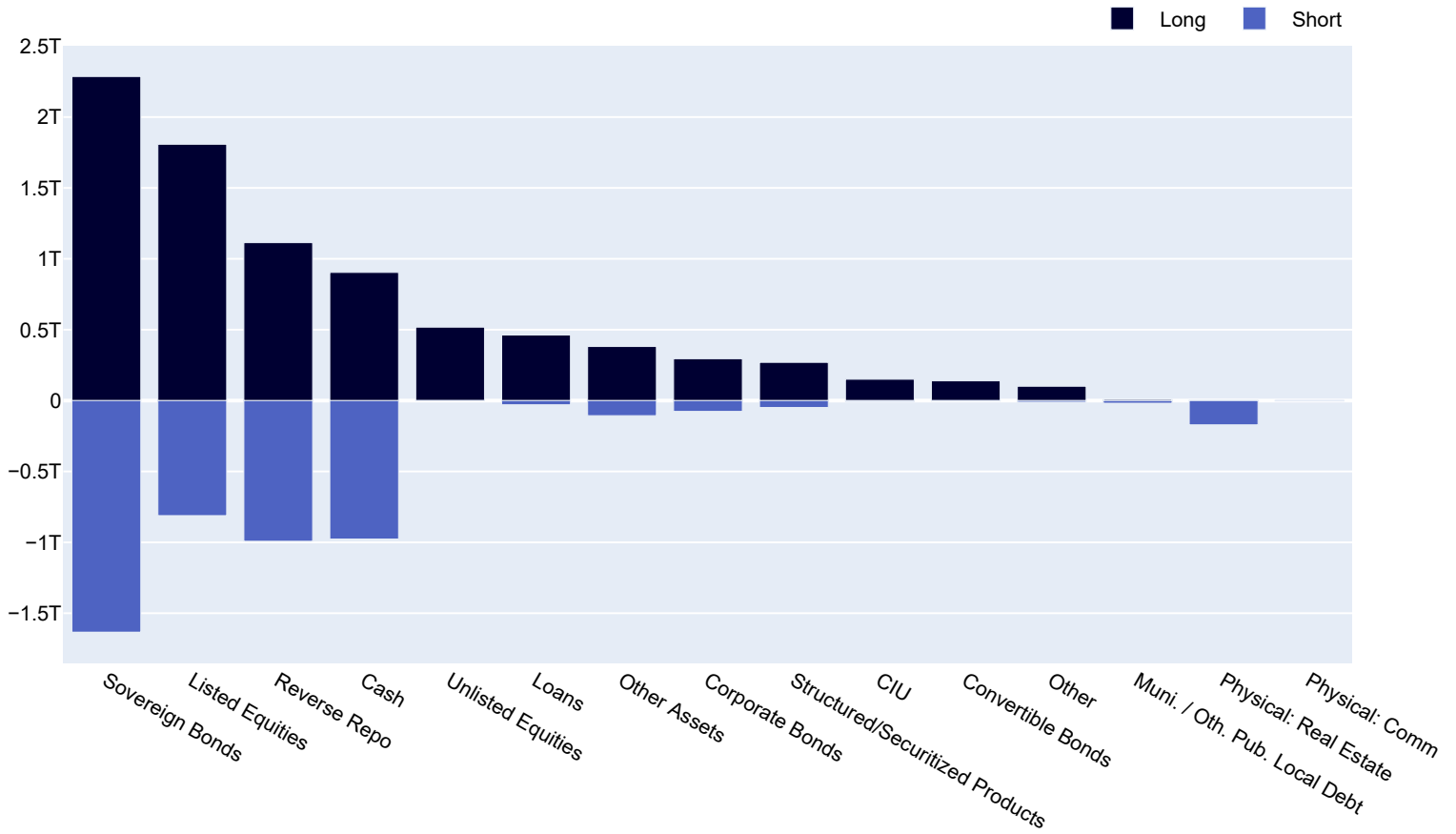


Looking at the geographical investment focus by jurisdiction in Figure 9, the geographical investment focus in North America is primarily driven by the UK and Canada. More than half of their aggregate NAV is invested in this area. Similarly, investment focus in Asia and Pacific is primarily driven by Singapore. Moreover, from the data provided, Luxembourg, Switzerland, Jersey, Germany, and the Netherlands have a less concentrated geographical investment mix and are more diversified globally.

3.4 Hedge Fund Asset Class Exposure

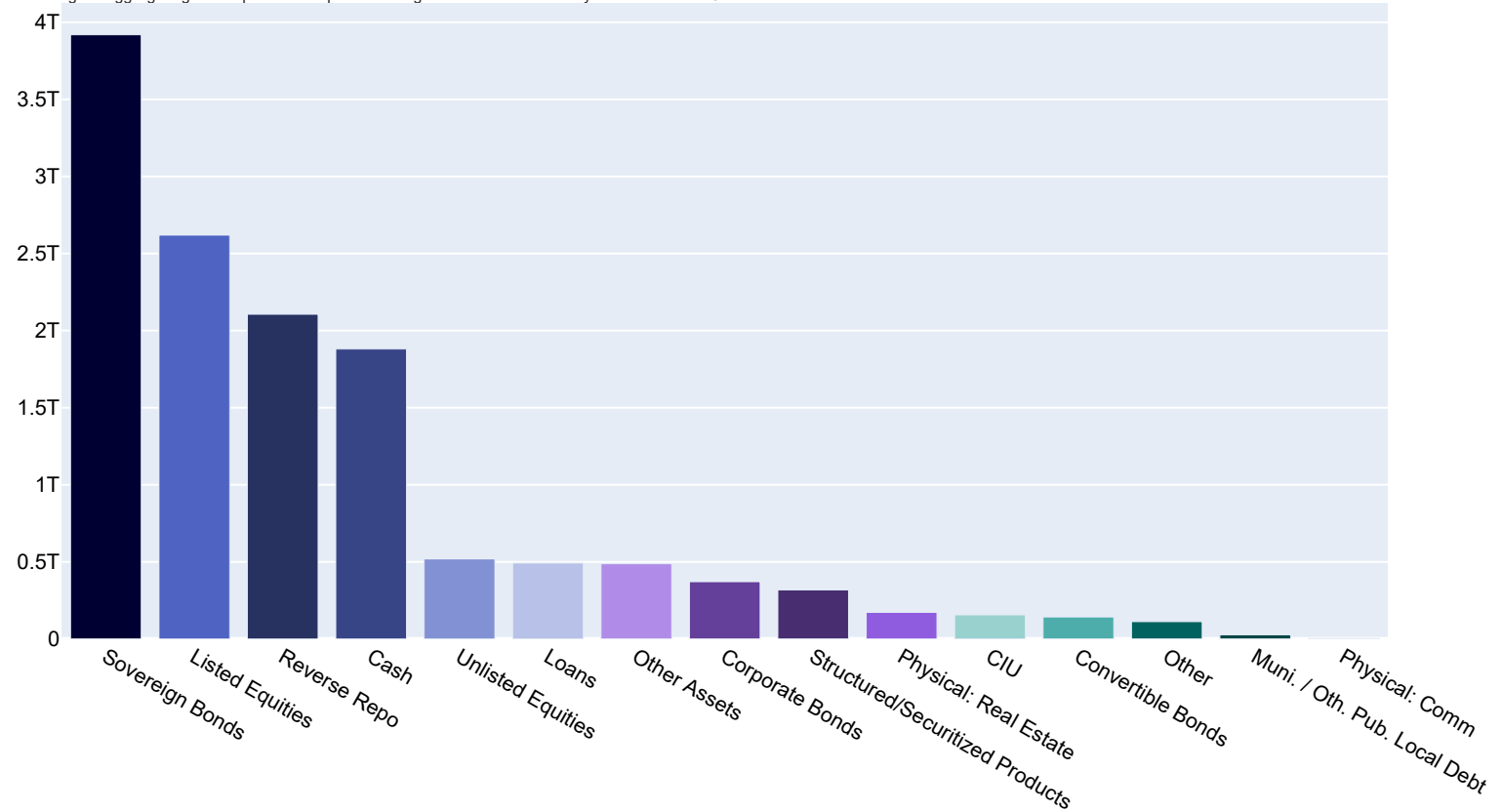
Long/Short Asset Class Exposure

Fig.10: Aggregate long/short exposures of qualified hedge funds broken down by asset class for 2022.



Gross Asset Class Exposure

Fig.11: Aggregate gross exposures of qualified hedge funds broken down by asset class for 2022.



QHF asset class exposures are highly concentrated in four main areas: sovereign bonds, listed equities, reverse repos and cash. These four asset classes comprise approximately 80% of the total notional exposure of QHFs.

Year-over-year comparison:

There remains a large GNE to cash, which is observed in conjunction with decreases in GNE of sovereign bonds and listed equities from the 2021 reporting year^[19]. The IMF Coordinated Portfolio Investment Survey observes that there was a steep decline in asset holdings for both debt and equity securities from 2021 to 2022^[20]. Based on the data observed, this trend is also apparent within the QHF industry.

As per previous years, GNE is the largest for sovereign bonds. This can be partially attributed to the importance of the relative value fixed income (sovereign arbitrage) strategies utilized by US QHFs (as noted in Section 3.2: Hedge Fund Investment Strategy). Both large long and short exposures to sovereign bonds substantiate the findings by the Federal Reserve^[21].

Additionally, as mentioned in Section 3.2, it is evident that repo markets remain a key method for QHFs to borrow cash to fund leveraged investment strategies, and also borrow securities to take short positions^[22].

Evidence from Central Banks

Box 2: Sovereign Bonds and Repo Market Activity.

The Bank of Canada (BoC) found similar prominence of hedge funds as the Federal Reserve in the Government of Canada (GoC) bond market and repo markets^[23]. The BoC found that hedge funds played an important role in supporting two-sided markets by often taking opposite sides of trades compared to other market participants. Hedge funds traded 14% of the volume of GoC bonds transacted by other clients, but in the opposite direction to other clients. Viewed differently, all else equal, if hedge funds were not taking opposite directions on these trades, dealers would need to intermediate an additional 14% of transaction volume from other clients using their own balance sheets. In the repo market, hedge funds accounted for 36% of the dealer-to-client repo market transaction volume where GoC bonds were used as collateral.

Furthermore, looking at the European banks' asset exposures to non-bank financial institutions (NBFIs), there is a large percentage of repo liabilities^[24], suggesting that NBFIs (including QHFs) have a significant exposure to reverse repos and play a key role in European banks' short-term funding.

When looking at the data for QHFs there are significant long and short exposures in the repo market. This means that QHFs act as both lenders and borrowers in the repo market. Because reverse repo data was not available in previous reports, a comparison of trends prior to 2022 is not possible, and it is difficult to determine if there have been significant changes to repo market exposures of QHFs since 2020. That said, ICMA found that the EU, US, and GBP repo markets were relatively calm at the end of 2022^[25], in part due to initiatives by the ECB/DFA, Federal Reserve and Bank of England (BoE) to address concerns around collateral scarcity and liquidity, and to stabilize the markets.

[19] See FR01/23 IOSCO Investment Funds Statistics Report, Final Report, Report of the Board of IOSCO, January 2023, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD725.pdf>

[20] See the IMF Data on Coordinated Portfolio Investment Survey (CPIS), August 2023, available at: <https://data.imf.org/?sk=b981b4e3-4e58-467e-9b90-9de0c3367363&sid=1481574691948>

[21] See the Federal Reserve note on "Sizing hedge funds' Treasury market activities and holdings", October 2021, supra fn 14

[22] See the ICMA answers on "What is the role of repo in financial markets?", August 2021, available at: <https://www.icmagroup.org/market-practice-and-regulatory-policy/repo-and-collateral-markets/icma-ercc-publications/frequently-asked-questions-on-repo/3-what-is-the-role-of-repo-in-the-financial-markets/>

[23] See the Bank of Canada note "Do hedge funds support liquidity in the Government of Canada bond market?", August 2023, available at: <https://www.bankofcanada.ca/2023/08/staff-analytical-note-2023-11/>

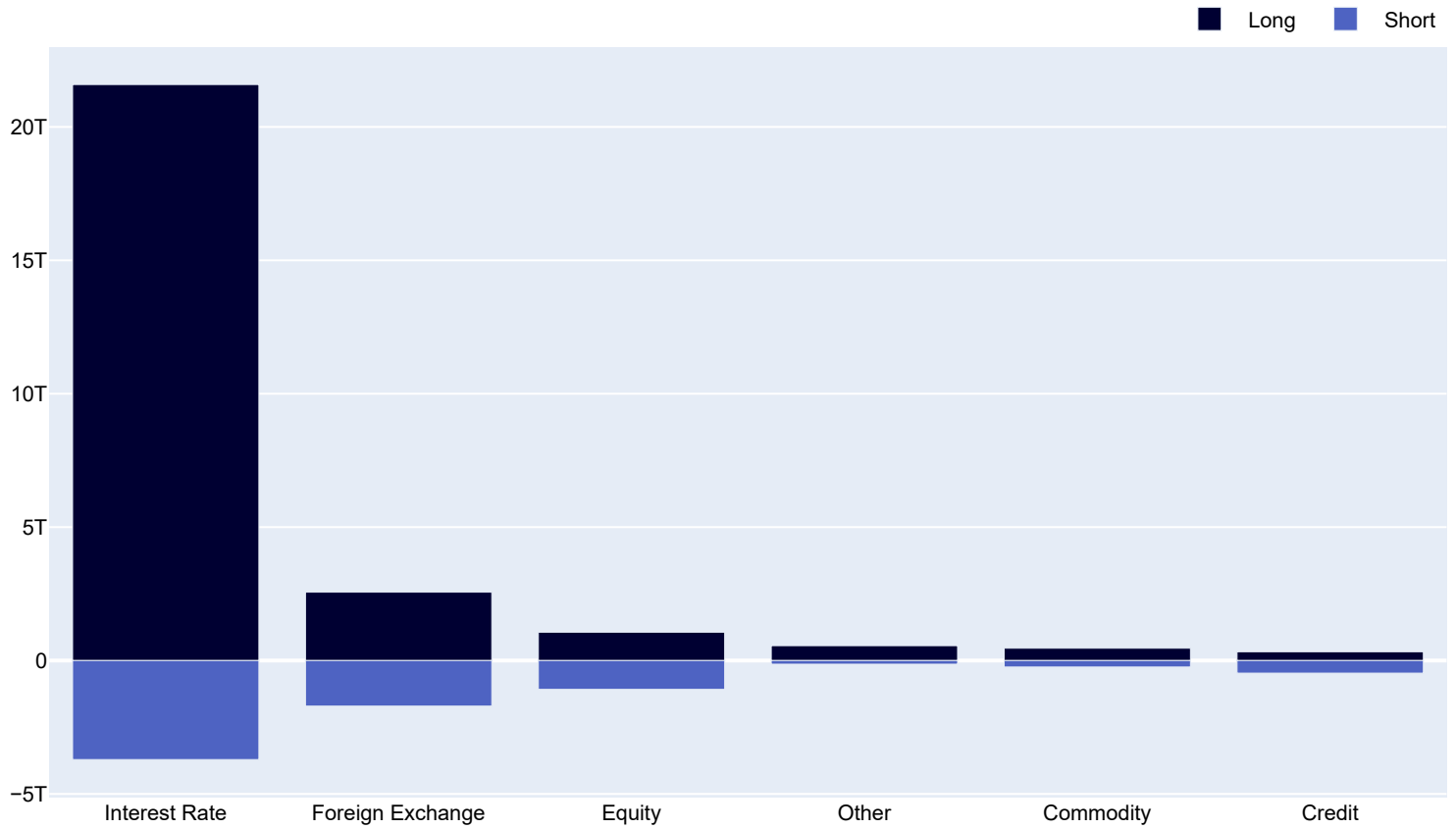
[24] See the ECB feature on "Key linkages between banks and the non-bank financial sector", May 2023, available at: https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart202305_02~1ff06bc324.en.html

[25] See the ECB article "Derivatives transactions data and their use in central bank analysis", 19 June, available at: https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201906_01~dd0cd7f942.en.html

3.5 | Hedge Fund Derivatives Exposure

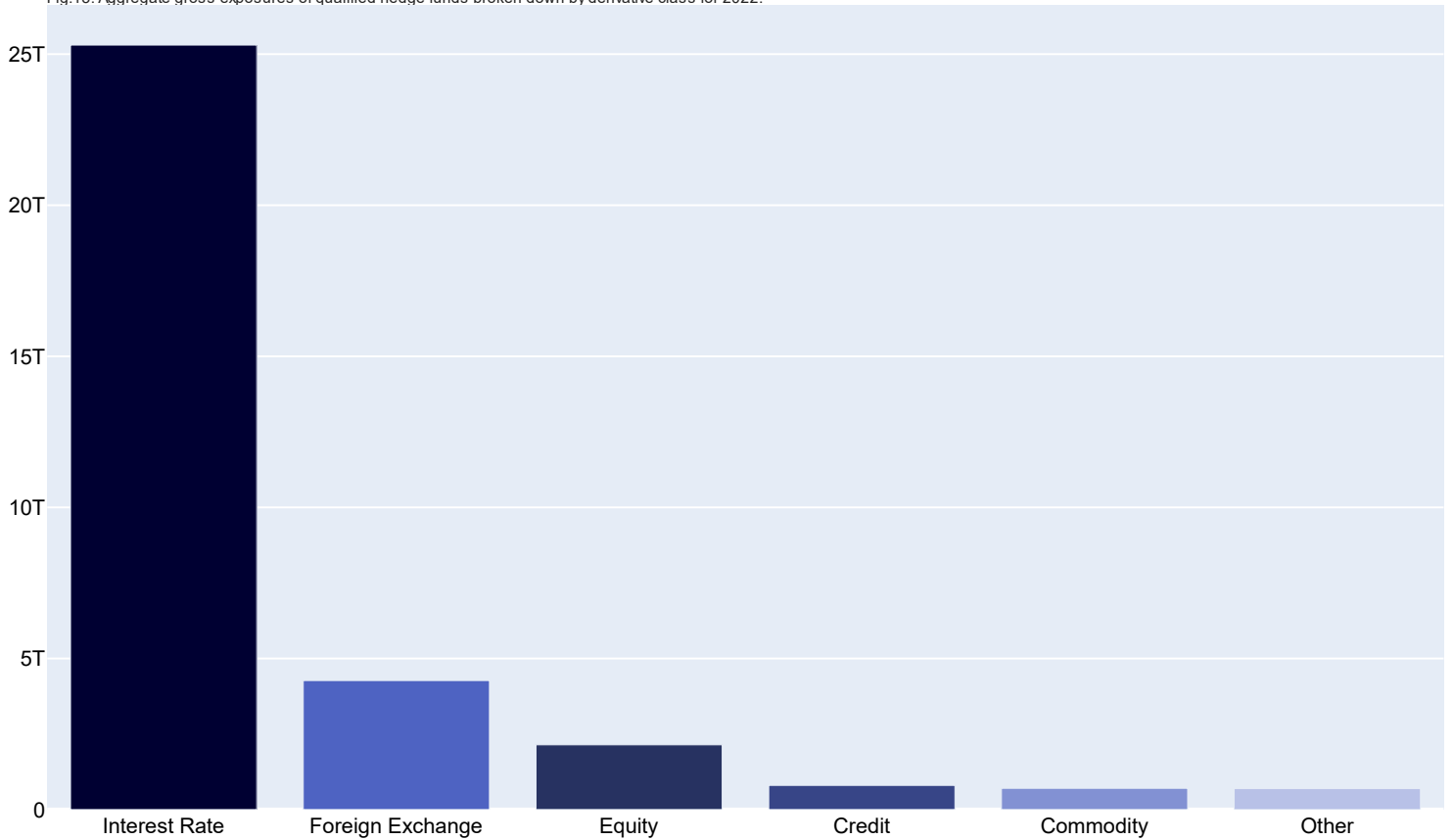
Long/Short Derivatives Exposure

Fig.12: Aggregate long/short exposures of qualified hedge funds broken down by derivative class for 2022^[26].



Gross Derivative Exposure

Fig.13: Aggregate gross exposures of qualified hedge funds broken down by derivative class for 2022.



[26] AIFMD reporting does not allow for the segregation of long and short exposures, and due to the structure of the Investment Funds Survey, the reported data may overestimate the long exposure for funds in jurisdictions under this reporting regime.

Figure 12 shows that QHFs have a large notional exposure to IR derivatives. It is important to note that aggregate notional exposure to IR swaps does not accurately depict the size of the market due to the nature of the contracts. The short-term nature of many IR Swaps, and the tendency to hold off-setting positions with counterparties, significantly overstates the size of the IR Swap market^[27]. Though specific product information is not collected, and the relative size of IR Swaps is unknown, data from the ECB^[28] suggests that IR Swaps make up over half of the IR derivatives markets in the EU in notional terms. Further, given the size of the exposure to sovereign bonds and the predominance of relative value fixed income strategies (as discussed in Section 3.4), it can be said that QHFs' exposure to IR derivatives could be a result of hedging IR risk using IR Swaps, or speculation. Recent work by the BoE suggests that UK hedge funds are not using IR Swaps for hedging purposes, rather they are using IR Swaps for speculative purposes to increase exposures.

Qualified Hedge Fund Speculation with Interest Rate Derivatives in the UK

Box 3: Bank of England findings on the use hedging and hedge fund concentration of IR derivatives in the UK.

The BoE found little evidence to support hedge funds' use of IR derivatives to hedge gilt exposures^[29], which does not support the use of IR derivatives to hedge sovereign bond positions. The findings suggest that IR derivatives are primarily used for speculative purposes and tend to amplify exposures to sovereign bonds. Further, the BoE found that the use of IR derivatives is highly concentrated among a few large hedge funds, who have large speculative positions in both sovereign bonds and IR derivatives.

Thus, it cannot be concluded that leverage in the IR derivatives market is understated. Given the large amount of long exposure to IR derivatives, and the findings by the BoE, there may be more speculation than hedging in this area. Specifically, when looking at the synthetic leverage in Table 3 (see Appendix 3), UK QHFs are significantly more leveraged than other jurisdictions at about 60x NAV, with the next highest jurisdiction being the Netherlands at 11.1x NAV. It is important to note that, in aggregate, the total leverage may be overstated. Without more specific information on the duration of the derivatives, and the extent of off-setting positions with similar maturities, the total leverage here may not be indicative of the level of risk.

For the 2022 reporting year, the report includes some survey data on long and short exposures to interest rate (IR) and foreign exchange (FX) derivatives, which was previously not available. However, the UK represents approximately 68% of the GNE to IR derivatives and is not able to differentiate between long and short exposures, thus, the short exposure for IR derivatives may be significantly understated. The short exposure helps to provide a more accurate depiction of leverage on a net basis.

Year-over-year comparison:

While there remains a large amount of GNE to IR and FX derivatives, both derivative categories have experienced declines in size; the other derivative categories have grown slightly compared to the 2021 reporting year. On an equivalent basis, comparing jurisdictions who reported for both 2021 and 2022, there is a 4% decrease in FX derivatives' total GNE and 23% decrease in IR derivatives' total GNE. Due to the large amount of GNE in FX and IR derivatives, overall, on an equivalent basis, there is a 23% decline in Derivatives GNE for 2022.

Please see Appendix 2 for a breakdown of the credit derivative and commodity derivative categories.

[27] See the Commodity Futures Trading Commission Staff Research Paper "Introducing ENNs: A Measure of the Size of Interest Rate Swap Markets", January 2018, available at: https://www.cftc.gov/sites/default/files/idc/groups/public/@economicanalysis/documents/file/oce_enns0118.pdf

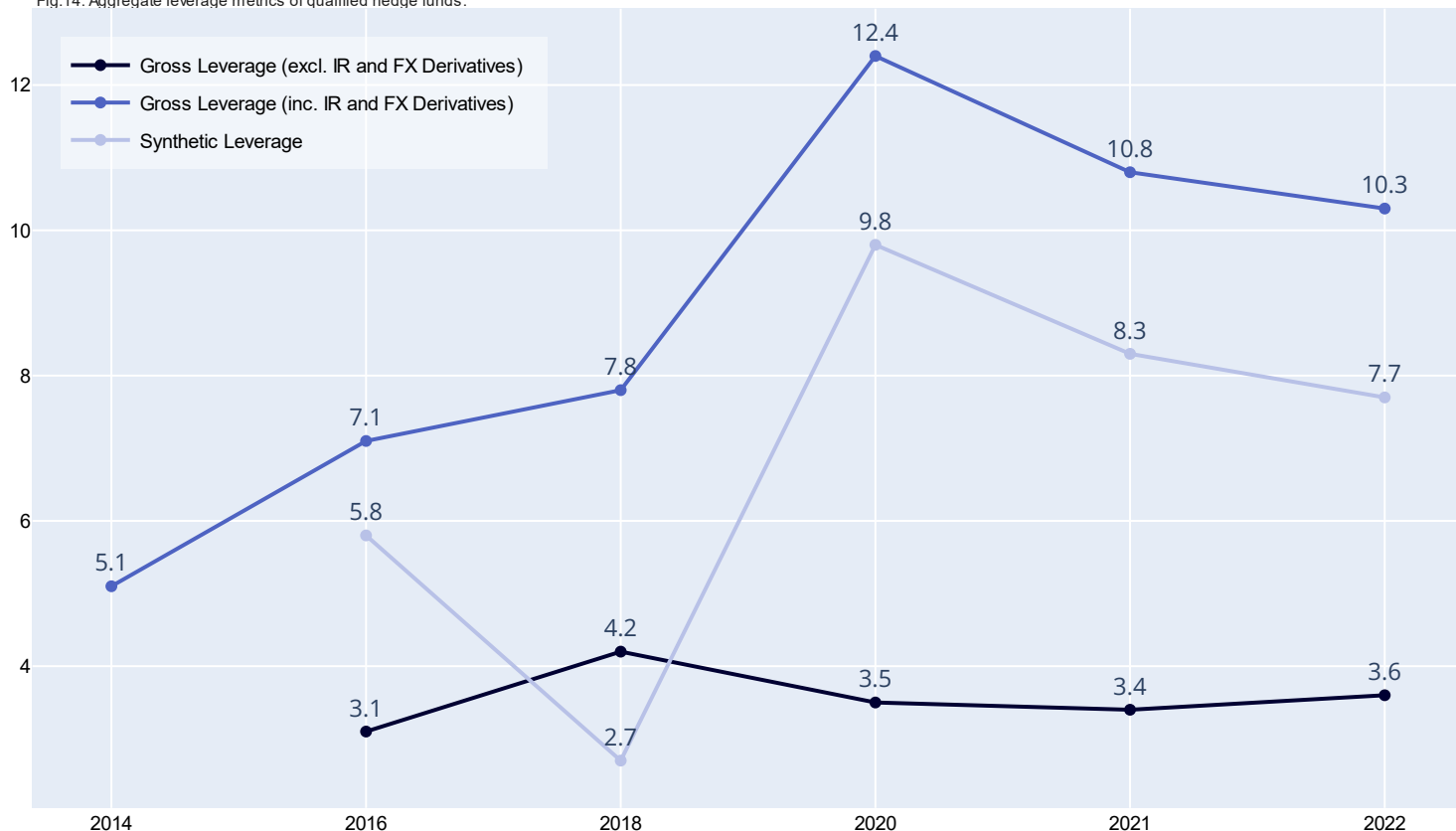
[28] See the ECB article "Derivatives transactions data and their use in central bank analysis", June 2019, available at: https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201906_01~dd0cd7f942.en.html

[29] See the Bank of England working paper "Hedging, market concentration and monetary policy: a joint analysis of gilt and derivatives exposures", July 2023, available at: <https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2023/hedging-market-concentration-and-monetary-policy-a-joint-analysis-of-gilt-and-derivatives-exposures.pdf>

3.6 | Hedge Fund Leverage

Leverage Metrics

Fig.14: Aggregate leverage metrics of qualified hedge funds.



Gross leverage for QHFs remains lower than 2020 levels on aggregate, standing at 10.3x NAV. It is important to note that on an individual fund or fund manager level, gross leverage may vary from the gross leverage values presented in Figure 14. There is a similar pattern observed for synthetic leverage, resulting from the large proportion of derivatives exposure within QHFs' total GNE. When excluding IR and FX, gross leverage stands at 3.6x NAV.

Year-over-year comparison:

Looking at Figure 14, gross leverage continues to decline from the peak observed in 2020, though it remains significantly above the levels observed for 2018. When excluding IR and FX derivatives from the gross leverage calculation, leverage across the remaining asset classes is increasing, yet remains below 2018 levels.

Synthetic leverage captures funds' off-balance sheet risk from the creation of debt through the use of derivatives. Synthetic leverage stands at 7.7x NAV and continues to decline from 2020 levels. This is complementary to the decreases described in Section 3.5. Overall, synthetic leverage is not seen as a growing concern, yet some jurisdictions remain highly leveraged in this area (see Appendix 3 for a breakdown by jurisdiction).

Total Aggregate Borrowing

Fig.15: Total aggregate cash and securities borrowings of qualified hedge funds.

Note: Cash borrowings include borrowing from reverse repo transactions.

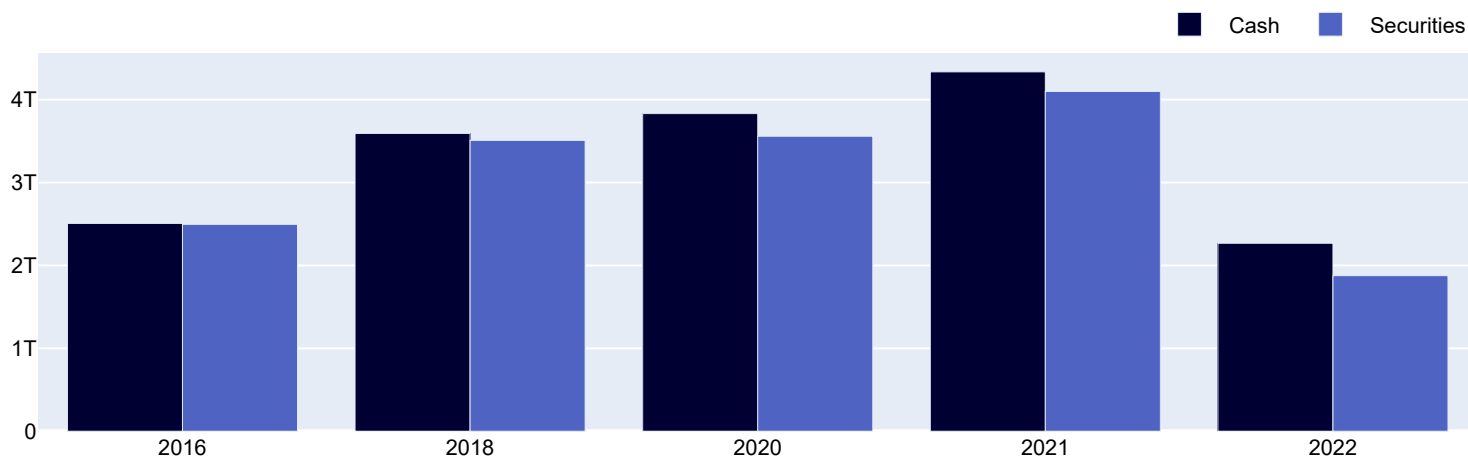


Figure 15 depicts the trend for cash and securities borrowings by QHFs. While cash borrowings remain slightly larger than securities borrowings again in 2022, QHFs reduced both their cash and securities borrowings by a significant amount since 2021. Figure 16 depicts this reduction in total borrowing, with financial leverage falling from 1.74x NAV in the 2021 reporting year to 0.95x NAV in the 2022 reporting year. Recall that the data is measured at a single point in time (December 31, 2022)^[30], and this may explain the lower figure.

In total, funds posted approximately USD 4,692b in collateral, which is above the total amount of QHF borrowings. This could be a result of the increased usage of repo markets to fund strategies, and the total amount of short exposure (see Section 3.4). It appears that QHFs on aggregate are over-collateralized, though there is not enough data on the breakdown of collateral to assess the total collateral posted through securities financing transactions. Further, without more information on the total margin, it is difficult to determine the true risk in this area. QHFs also held approximately USD 1,374b in unencumbered cash. The cash ratio can be calculated as the total unencumbered cash over the total aggregate NAV, equating to 0.31 (31%).

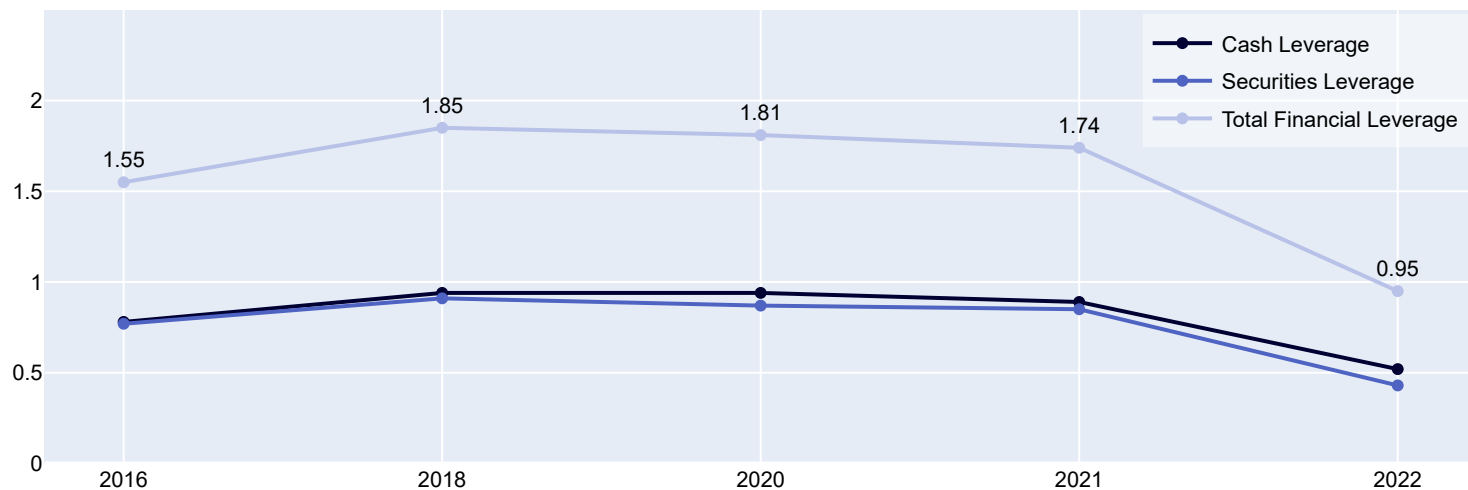
Year-over-year comparison:

The cash ratio for the 2022 reporting year is 0.31 (31%), which is a 20% increase year-over-year. This is primarily a result of unencumbered cash remaining at similar levels to the 2021 report, while total aggregate NAV decreased. This might also suggest that hedge funds are holding more cash due to global macro uncertainty^[31].

Financial Leverage

Fig.16: Aggregate cash and securities financial leverage by QHFs as a multiple of total aggregate NAV.

Note: Cash borrowings include borrowing from reverse repo transactions.



[30] Except for the US data, which is observed on September 31, 2022.

[31] See Financial Times article "Big investors increase cash holdings to highest levels since 9/11 attack", May 2022, available at: <https://www.ft.com/content/d68fad67-8b0b-4e32-8a5a-52f3a7464e76>

3.7 Hedge Fund Counterparty and Liquidity Risk

Cumulative Average Investor and Portfolio Liquidity Risk

Fig.17: Average aggregate investor and portfolio liquidity risk as a percent of total aggregate NAV of qualified hedge funds over each cumulative liquidity period for 2022.

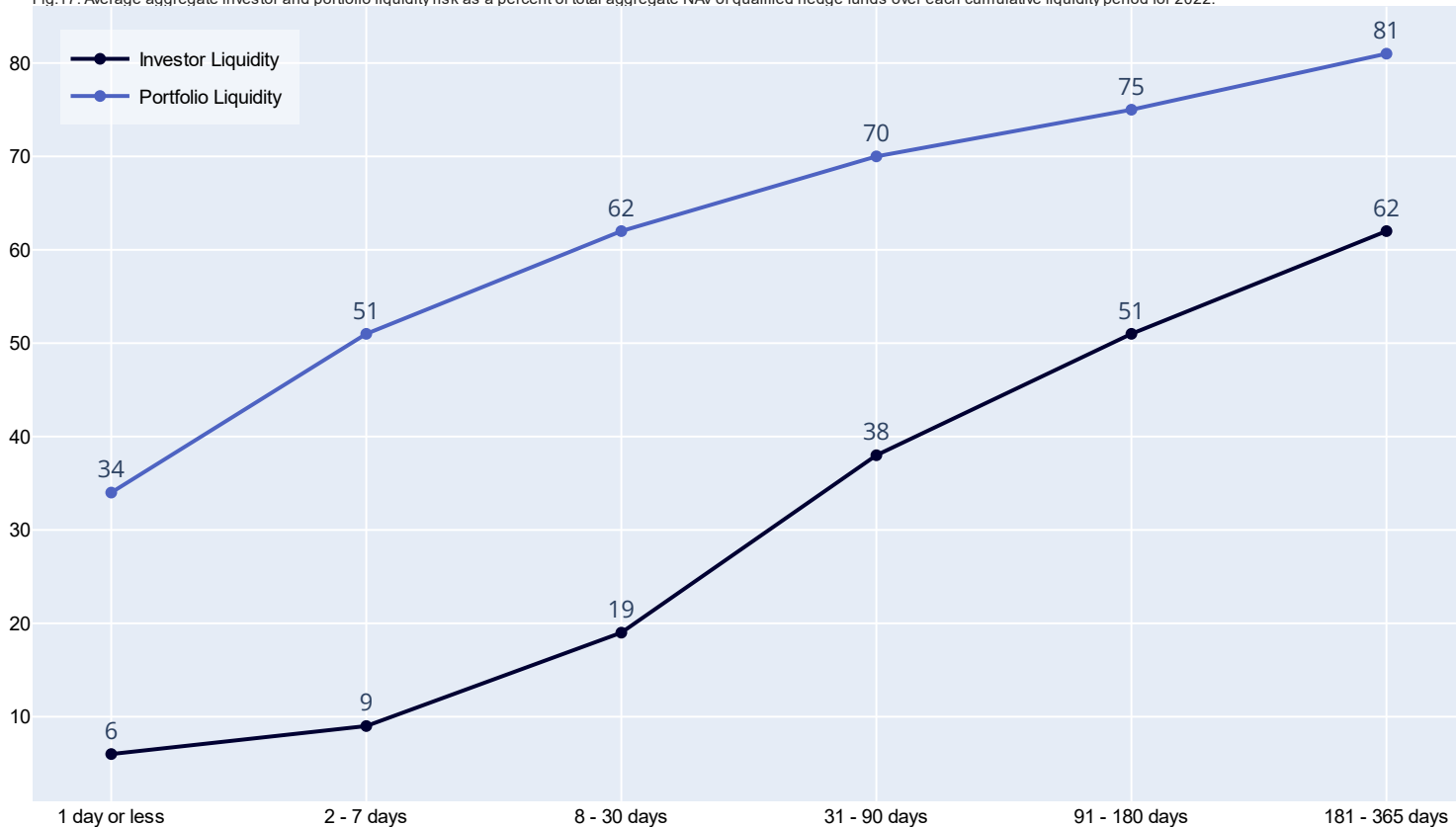


Figure 17 depicts QHF’s ability to meet investors’ redemption demands over certain liquidity periods. The portfolio liquidity line measures the cumulative amount of the fund’s portfolio that could be liquidated at each period. The investor liquidity line measures the cumulative amount of the funds’ equity that could be redeemed by investors at each period.

On average, investor and portfolio liquidity follow a similar trend, steadily increasing up to a peak between 181-365 days. Within one year, on average, the total cumulative amount of a QHF’s portfolio that could be liquidated is 81%, which is sufficient to cover the total cumulative amount of investor redemptions of 62%. However, because this is viewed in aggregate and during normal market conditions, it is not necessarily indicative of liquidity demands under stressed conditions and individual liquidity mismatches for each individual fund (see appendix 2 for a breakdown of portfolio and investor liquidity by jurisdiction).

This is also in part due to the variance in lock-up periods and redemption frequencies associated with each qualified hedge fund. Most qualified hedge funds have a lock-up period of at least 30-days, and it is evident by looking at Figure 17 that after 30-days there is a significant increase in the percentage of equity able to be redeemed by investors.

See Appendix 2 for a breakdown of portfolio and investor liquidity by jurisdiction.

Centrally Cleared vs. Bilaterally Cleared

Fig.18: Boxplot showing the spread of centrally cleared vs. Bilaterally Transacted percentages for each jurisdiction's qualified hedge funds for 2022.

Note: The box plot shows the interquartile range (IQR), lower fence ($Q1 - 1.5 * IQR$), upper fence ($Q3 + 1.5 * IQR$), upper quartile - (Q3), lower quartile (Q1), and the median (solid line). Additionally, the dotted line represents the mean, and the dotted triangles represent the standard deviation.

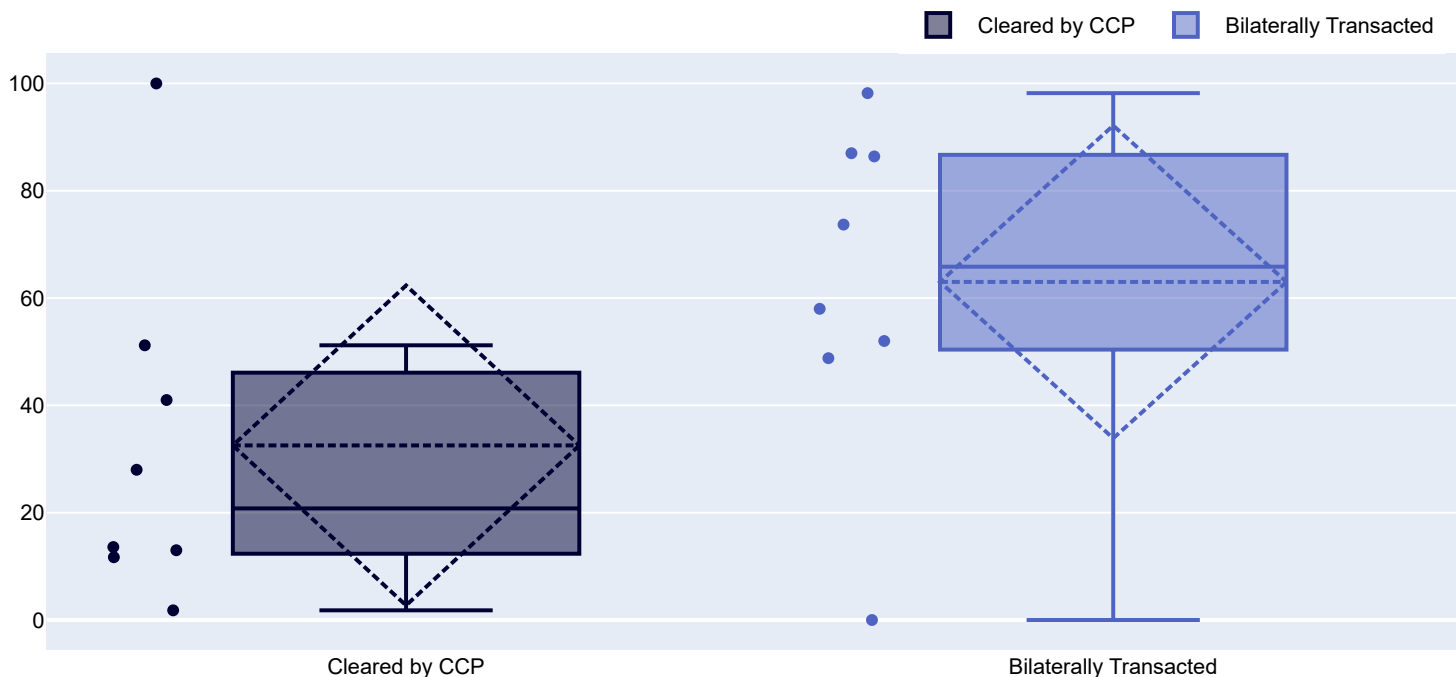
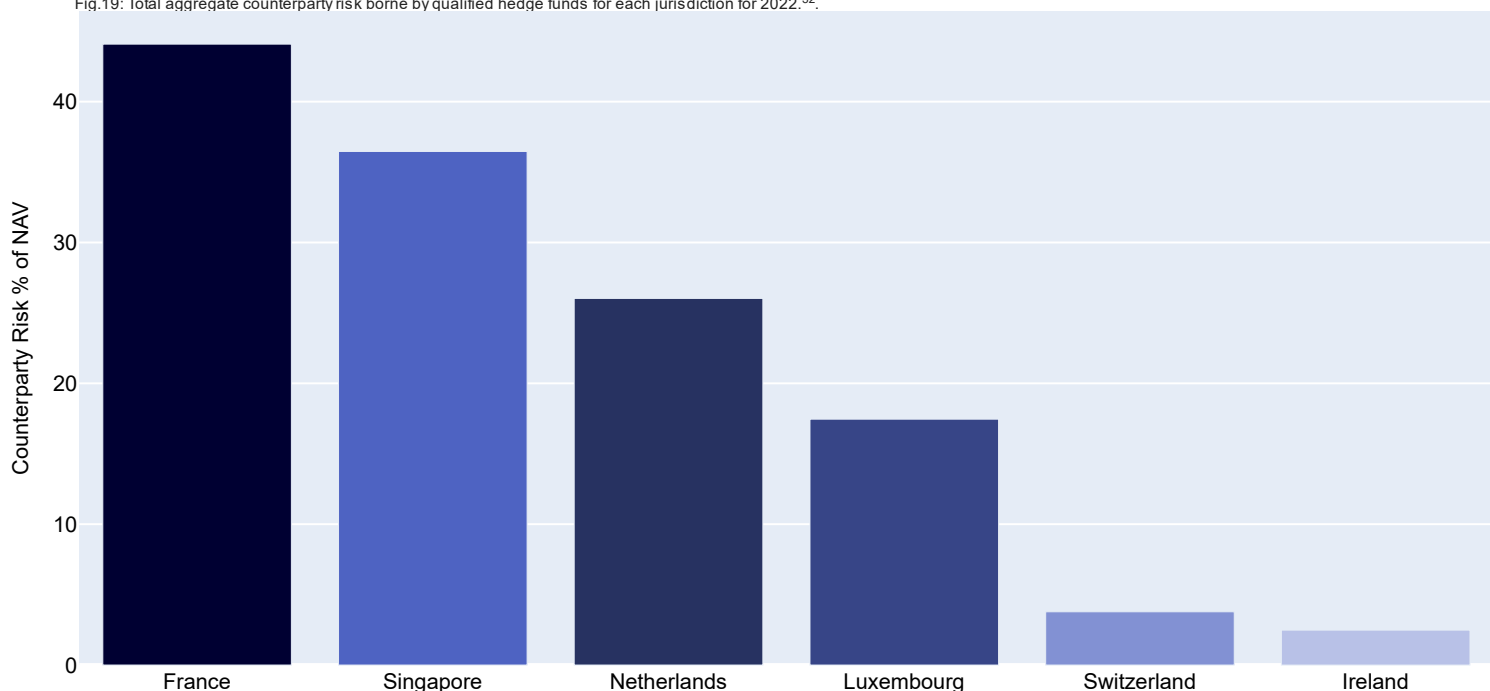


Figure 18 describes the split between trades cleared through a central clearing counterparty (CCP) and trades that are transacted bilaterally. It is evident from this graph that most QHFs' over-the-counter (OTC) derivatives trades are transacted bilaterally, rather than through a CCP. From the data collected, on average, 63% of QHF trades are transacted bilaterally, and 32.5% of QHF trades are cleared through a CCP. It is also evident that the median is less, with half of the jurisdictions reporting less than 20% of trades cleared through a CCP. Without sufficient data on margin, it is difficult to identify the true risk associated with this level of bilateral transactions.

The level of bilateral transactions suggests that counterparty risk could be high in certain jurisdictions. However, looking at Figure 19, on aggregate, the total counterparty risk borne by QHFs is relatively low, with France having the highest counterparty exposure of 44% total aggregate NAV.

Hedge Fund Counterparty Risk

Fig.19: Total aggregate counterparty risk borne by qualified hedge funds for each jurisdiction for 2022.³²



[32] Under AIFMD, funds are only required to report the total exposure amount to the top 5 greatest counterparty exposures.

4. OPEN-ENDED FUNDS

Open-Ended Funds Risk Remains Low

The report provides an overview and assessment of the leverage within the open-ended funds industry. This section relies on OEF data from IOSCO member submissions for December 31, 2022^[33]. The survey encompasses data on 72,115 OEFs with a total aggregate NAV of USD 46.6T from 22 jurisdictions around the world.

It is important to note that some jurisdictions with large fund industries do not have the reporting requirements in place to participate in the report. Specifically, for European jurisdictions, harmonized reporting requirements only exist for funds that fall within the scope of AIFMD reporting. Due to this, only Luxembourg, Italy, Spain, and Belgium provide data on UCITS. Luxembourg^[34] and Italy^[35] do not have more granular data available for UCITS, therefore adjustments have been made to the total aggregate NAV in the leverage calculations.

Excluding Luxembourg and Italy, which do not have granular data available on UCITS for leverage calculations, and China, Sections 4.4 to 4.7 encompass data on 51,252 OEFs with a total aggregate NAV of USD 39.47T.

For the 2022 investment funds survey there is a significant change in both the number of funds reported and total aggregate NAV, compared to the 2021 reporting year. Compared to last year, 8 fewer submissions were received, a 24% decrease in participation year-over-year.

The total number of OEFs decreased by 2.4%. Excluding the jurisdictions who provided data for 2021 and not 2022, however, there is a 6% increase in number of funds reported.

Similarly, aggregate NAV for the 2022 reporting year has fallen 16% in comparison to the 2021 reporting year. Adjusting for the funds that have reported for both 2021 and 2022, a 14.5% decrease in total aggregate NAV for the 2022 reporting year is observed. Given the comparable decrease in total aggregate NAV, the reduced number of submissions is relatively inconsequential.

The US accounts for 16% of the OEFs and 56% of the total NAV captured in Section 4.1. Therefore, the following graphs and analysis are highly influenced by the US data. Consequently, downturn in the US equity and bond markets^[36] contributed to the significant declines in OEFs' total aggregate NAV.

Overall, OEF gross leverage has increased in 2022, primarily as a result of increase in IR derivatives GNE. Excluding IR and FX derivatives, gross leverage declined in 2022. Further, financial leverage has fallen from the 2021 reporting year, and both gross leverage and financial leverage remain relatively small. In addition, OEFs primarily transact their OTC derivatives trades bilaterally rather than through a CCP.

[33] The data for the US may be from October 31, 2022, November 30, 2022, or December 31, 2022 depending on when the fund has submitted their data.

[34] Luxembourg has UCITS data on fund type and geographical investment focus.

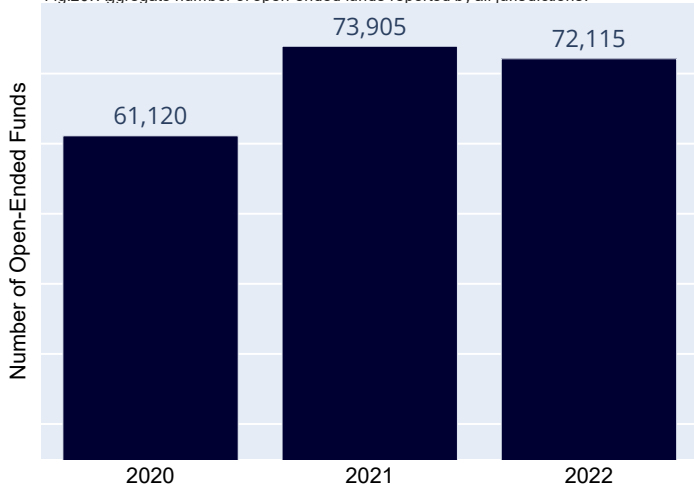
[35] Italy's UCITS data is not consistent with the IOSCO template structure.

[36] Measured from the Wilshire 5000 Total Market Index and the S&P US Aggregate Bond Index, supra fn. 10.

4.1 | Open-Ended Fund Aggregate Data

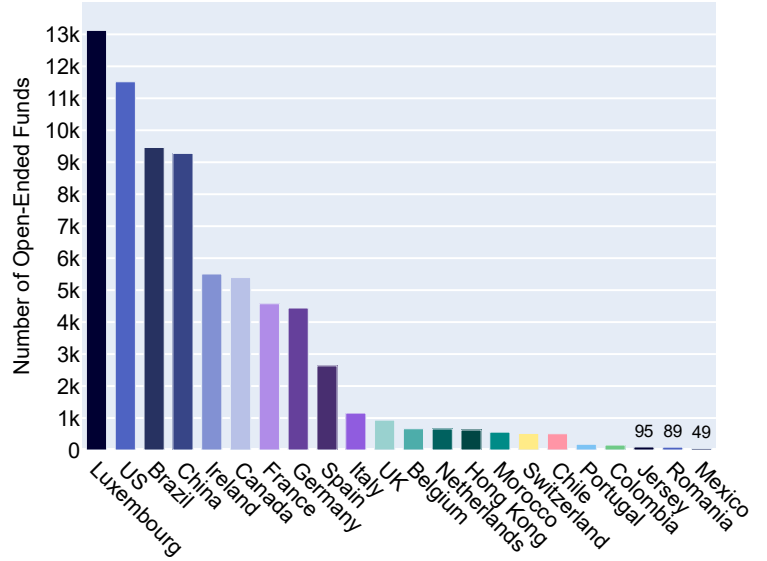
Total Open-Ended Funds

Fig.20: Aggregate number of open-ended funds reported by all jurisdictions.



Open-Ended Funds by Jurisdiction

Fig.21: Total number of open-ended funds reported by each jurisdiction for 2022.



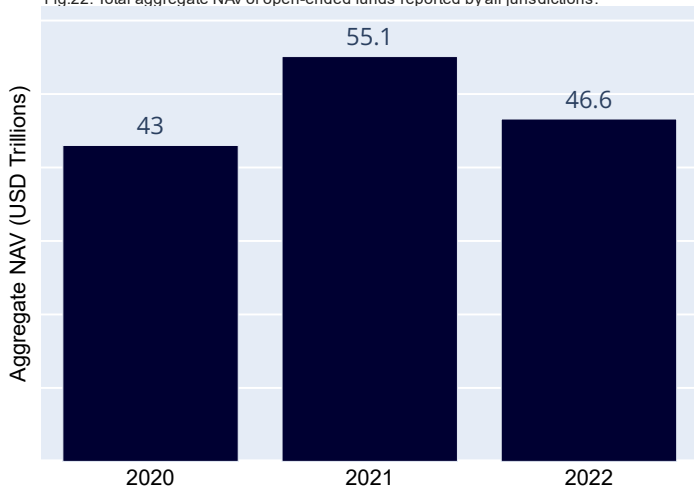
Year-over-year comparison:

Total OEFs reported^[37] decreased by 2.4%, however, looking at the top five jurisdictions there is an increase in the number of OEFs reported: Luxembourg (+173), the US (-179), Brazil (+883), China (+1,506) and Ireland (+451). Overall, comparing the jurisdictions that have reported for both 2021 and 2022 reporting years there is a 6% increase, and a weighted-average increase of 10%. Further, there was a significant increase in the number of OEFs reported by France (+104%) due to a widespread reclassification of funds^[38], and significant decrease in the number of OEFs for Spain (-32%)^[39].

Conversely, total aggregate NAV decreased by 16% from the 2021 reporting year and when taking into account the jurisdictions who had not reported for 2022, there is an 14.5% decline in total aggregate NAV. This is largely due to declines in the US (-19%), Luxemburg (-20%)^[40], and the Netherlands (-38%). Only three jurisdictions saw increases; France (+99%)^[41], China (+59%) and Brazil (+15%), while all remaining jurisdictions experienced declines in total aggregate NAV.

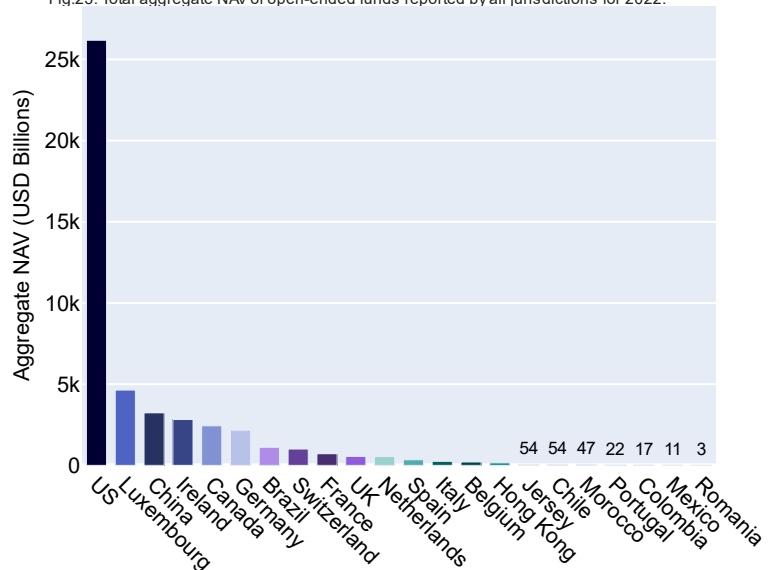
Total Aggregate NAV

Fig.22: Total aggregate NAV of open-ended funds reported by all jurisdictions.



Aggregate NAV by Jurisdiction

Fig.23: Total aggregate NAV of open-ended funds reported by all jurisdictions for 2022.



[37] Total number of OEFs and total NAV for Italy include UCITS funds, the proceeding figures do not.

[38] The large increase is a result of better classification of open-ended funds, supra fn 5.

[39] The large decrease is a result of changes in the tax regime that caused liquidation or transformation of a large number of investment companies, largely concentrated in a small number of investors. The size of these companies were small and the impact on total OEFs NAV was less significant.

[40] Declines by Luxemburg are a result of falling asset prices and market conditions.

[41] As mentioned above, due to widespread reclassification.

4.2 | Open-Ended Fund Type

Percentage of NAV by Fund Type

Fig.24: Aggregate NAV of open-ended funds as a percentage of total NAV broken down by fund type for 2022.

Fund Type

- Fixed Income Funds
- Equity Funds
- Mixed Funds
- Other
- Real Estate
- Alternative strategies aimed at achieving an absolute return
- Commodity Funds

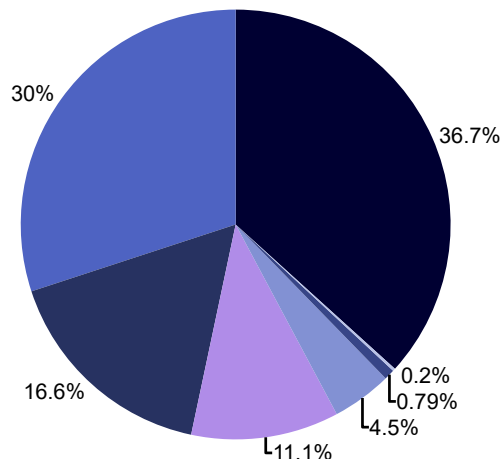


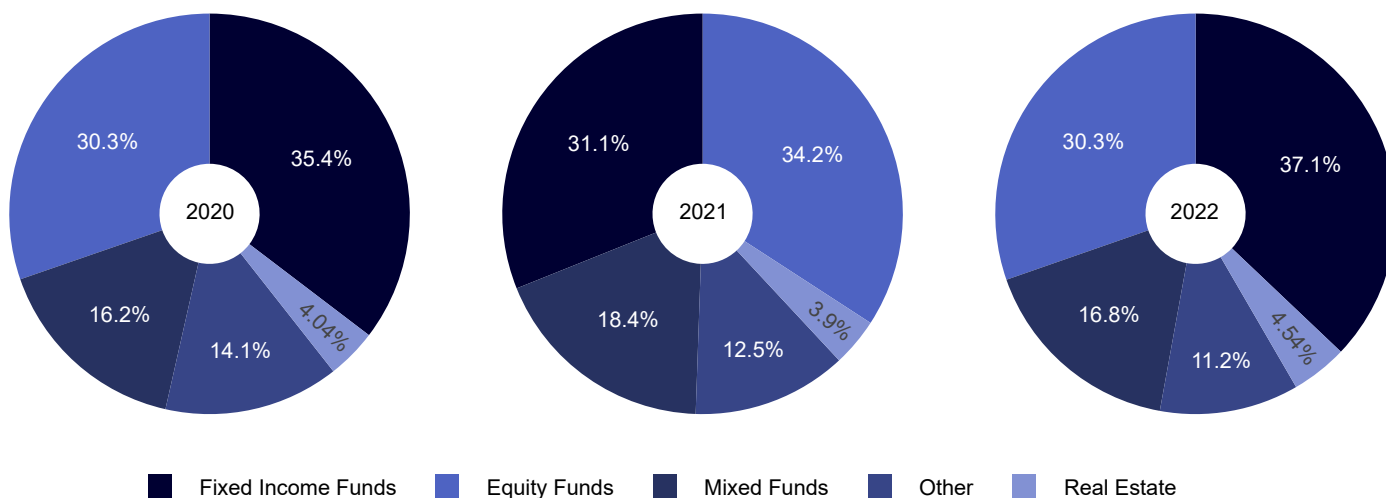
Figure 24 provides a breakdown of open-ended fund type^[42]. This graph shows that more than two-thirds of the total aggregate NAV is accounted for in two fund types: Fixed Income Funds and Equity Funds. The remaining third is largely distributed in Mixed Funds and Other, with Real Estate, Alternative Strategies and Commodity Funds encompassing about 5.5% of the total aggregate NAV.

Year-over-year comparison:

Compared to the previous two iterations of the IFSR which had collected data on OEFs, there is a similar breakdown of OEF type. Fixed Income Funds and Equity Funds remain similarly split, while growth is observed in the Real Estate Fund category (+16% YoY). This increase is a result of increases in France (+38%) and Luxembourg (+17%). Real Estate Funds represent a relatively small proportion of total aggregate NAV, accounting for less than 1% of the overall growth.

Fund Type: Year-Over-Year Comparison

Fig.25: Year-over-year comparison of the aggregate NAV as a percentage of total aggregate NAV of open-ended funds broken down by fund type.



[42] Excluding the US, US OEF fund type data is not available. Includes UCITS data for Luxembourg, Spain, and Belgium.

4.3 | Open-Ended Fund Geographical Investment Area

Total NAV by Geographical Investment Area

Fig.26: Total aggregate NAV of open-ended funds by geographical investment area for 2022.

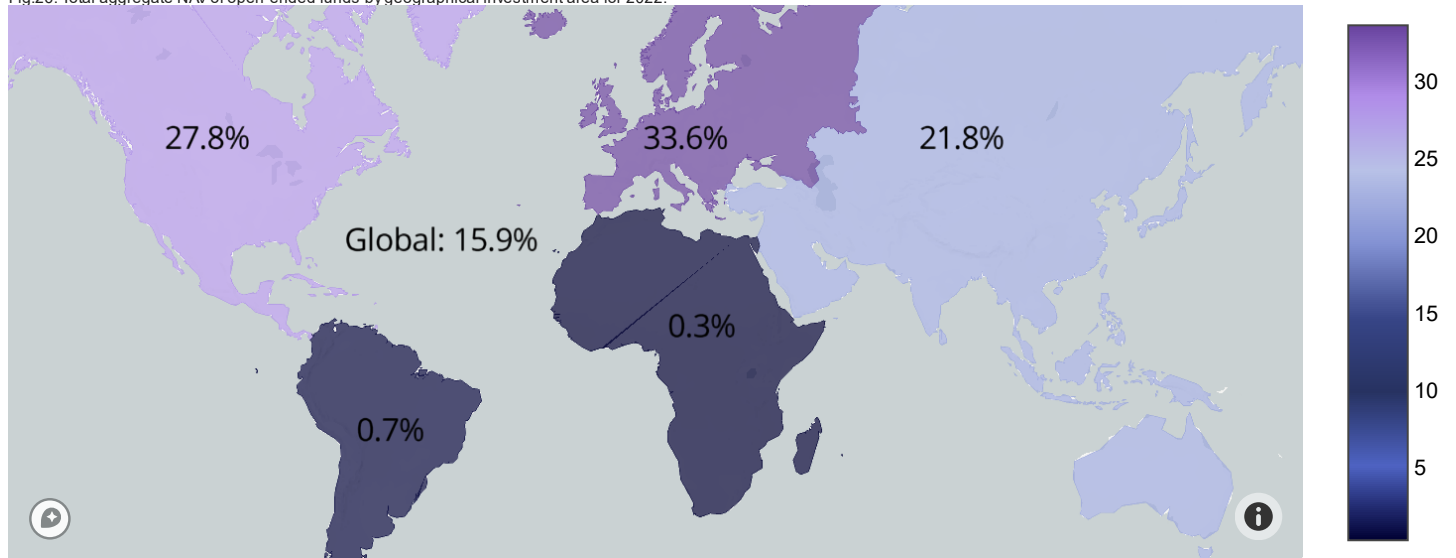


Figure 26 provides a breakdown of OEFs' geographical investment focus of all jurisdictions except the US. Excluding the US, ~62% of the investment focus is distributed within North America and Europe, while the remaining 48% is largely Global and Asia and Pacific.

Total NAV by Geographical Investment Area and Jurisdiction

Fig.27: Total NAV of open-ended funds by geographical investment focus for each jurisdiction for 2022.

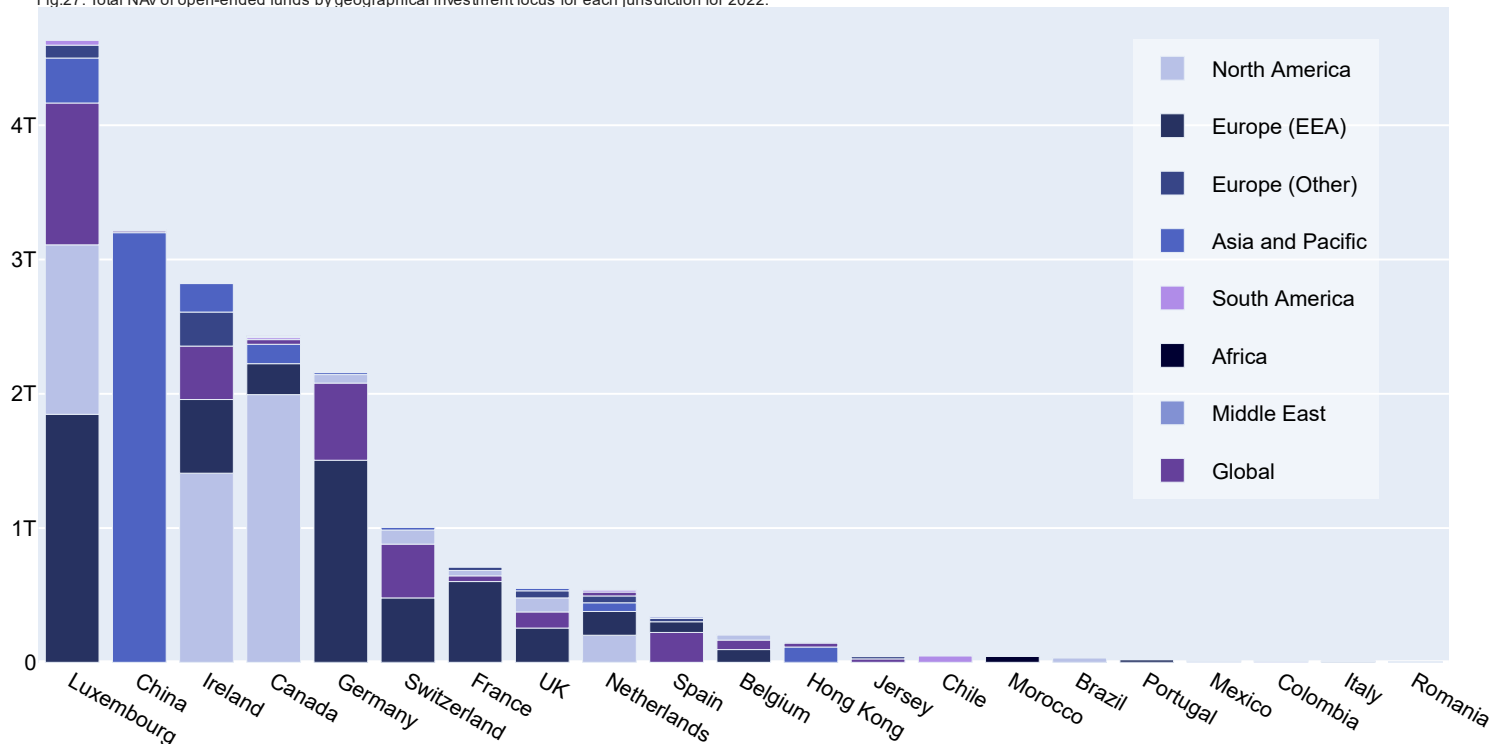
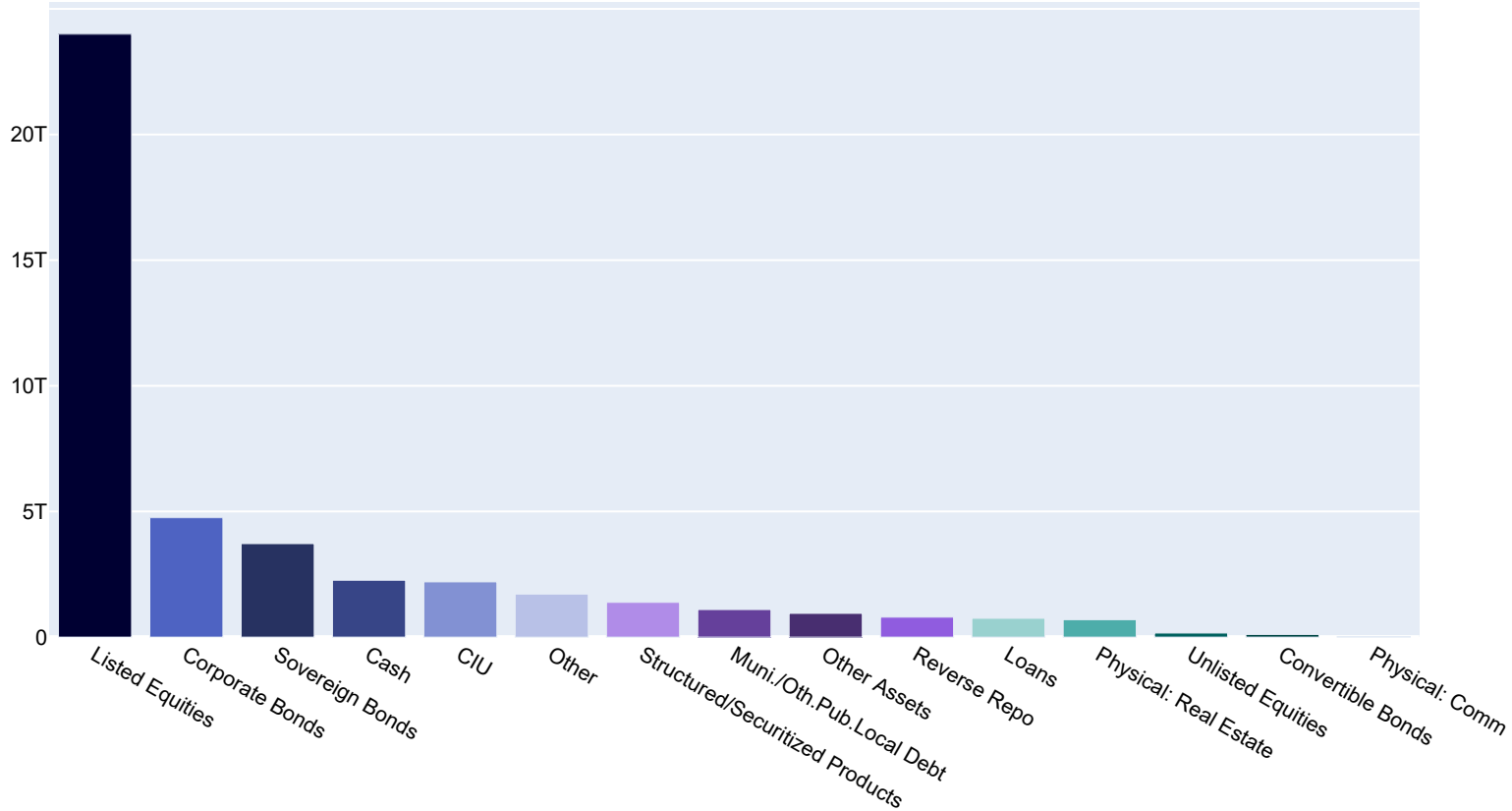


Figure 27 describes the geographical investment focus by jurisdiction. The geographical investment focus in Europe (EEA) is predominantly by European OEFs. Luxembourg, Ireland and Netherlands also have a large investment focus in North America. Similar to QHFs, the EU OEFs (except France) have a less concentrated geographical investment mix and are more diversified globally compared to other jurisdictions.

4.4 | Open-Ended Fund Asset Class Exposure

Gross Asset Class Exposure

Fig.28: Aggregate gross exposure of open-ended funds broken down by asset class for 2022.



OEFs hold few short positions across the asset classes. In total, short positions for all asset classes represent less than 1% of total aggregate NAV. Therefore, a gross exposure is provided in Figure 28 rather than a breakdown of long and short exposures.

In Section 4.2, it is noted that a majority of OEFs are split into Equity Funds and Fixed Income Funds. Further evidence of this is seen when looking at the gross exposures. From Figure 26, OEFs are highly exposed to Listed Equities, which encompasses 52% of the total aggregate NAV for OEFs. Accounting for Listed Equities, Corporate and Sovereign Bonds make up approximately 40% of the remaining aggregate NAV. In total, Listed Equities, Corporate Bonds, and Sovereign Bonds account for 70% of the total aggregate NAV of OEFs.

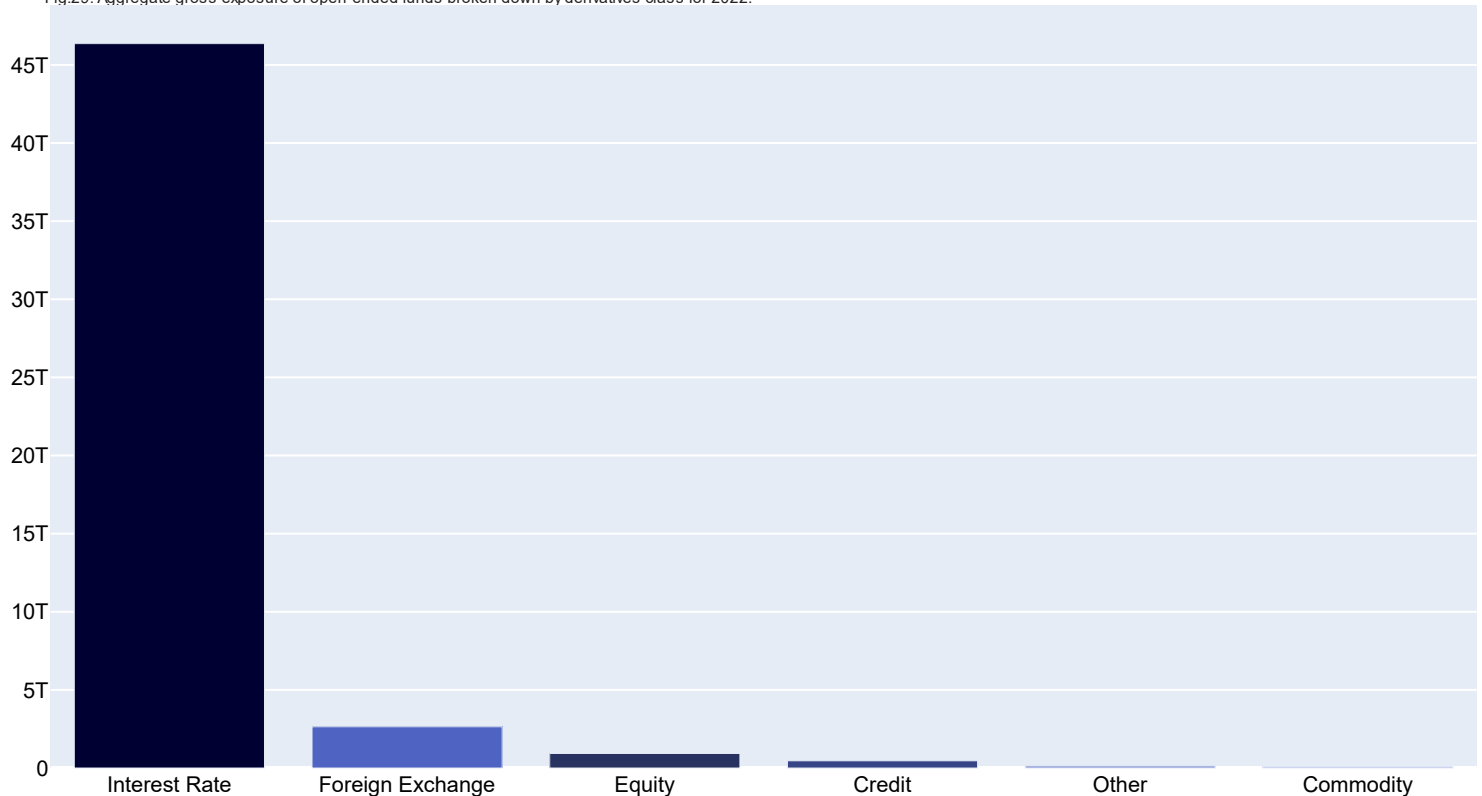
Year-over-year comparison:

The aggregate NAV of Corporate and Sovereign Bonds, as well as the percentage share of Fixed Income OEFs (see section 4.2), is falling. On an equivalent basis, comparing those who submitted data for both the 2021 and 2022 reporting years, exposure to Corporate Bonds decreased by 15% and exposure to Sovereign Bonds decreased by 12.5%.

4.5 | Open-Ended Fund Derivatives Exposure

Gross Derivative Exposure

Fig.29: Aggregate gross exposure of open-ended funds broken down by derivatives class for 2022.



Similar to asset class exposures, OEFs are primarily long derivatives. OEFs' total short GNE represents 5% of total aggregate NAV, primarily consisting of short IR derivatives exposure which accounts for 2.4%. This is significantly smaller compared to the long GNE, which represents 104% of total aggregate NAV. Therefore, the GNE of derivatives classes is exhibited in Figure 29 rather than a breakdown of long and short exposures.

Like QHFs, OEFs have a large exposure to IR derivatives, followed by FX and Equity derivatives. This may be a result of the large exposure to Corporate and Sovereign Bonds as discussed in Section 4.4, whereby IR derivatives are used for hedging IR risk or to speculate in these markets. It is important to note that the majority of the exposure to IR derivatives comes from the US data, which accounts for approximately 98% of the IR derivatives GNE.

Year-over-year comparison:

In comparison to the 2021 reporting year, there is a significant increase in the GNE for IR derivatives (+54%)^[43], while there is a significant decrease in GNE for Equity derivatives (-80%) and in GNE for FX derivatives (-28%).

Although data on UCITS is only available for Belgium and Spain^[44] for OEF derivatives exposures, the small contribution outside of the US OEFs seems to corroborate with the 2019 findings by ESMA on the use of derivatives by UCITS equity funds^[45]. ESMA notes that UCITS are minor in the derivatives market, and their exposure makes up a relatively small portion of the overall EU derivatives market on a gross basis. The derivatives positions for the other EU jurisdictions^[46] who only report AIFs are also small, with the total GNE of all derivatives classes amounting to 2.5T (< 5% of total derivatives GNE for all jurisdictions).

See Appendix 3 for a table with all OEF exposures.

[43] Part of this growth may be attributed to better reporting and N-PORT data mapping.

[44] Belgium and Spain also provide data on AIFs.

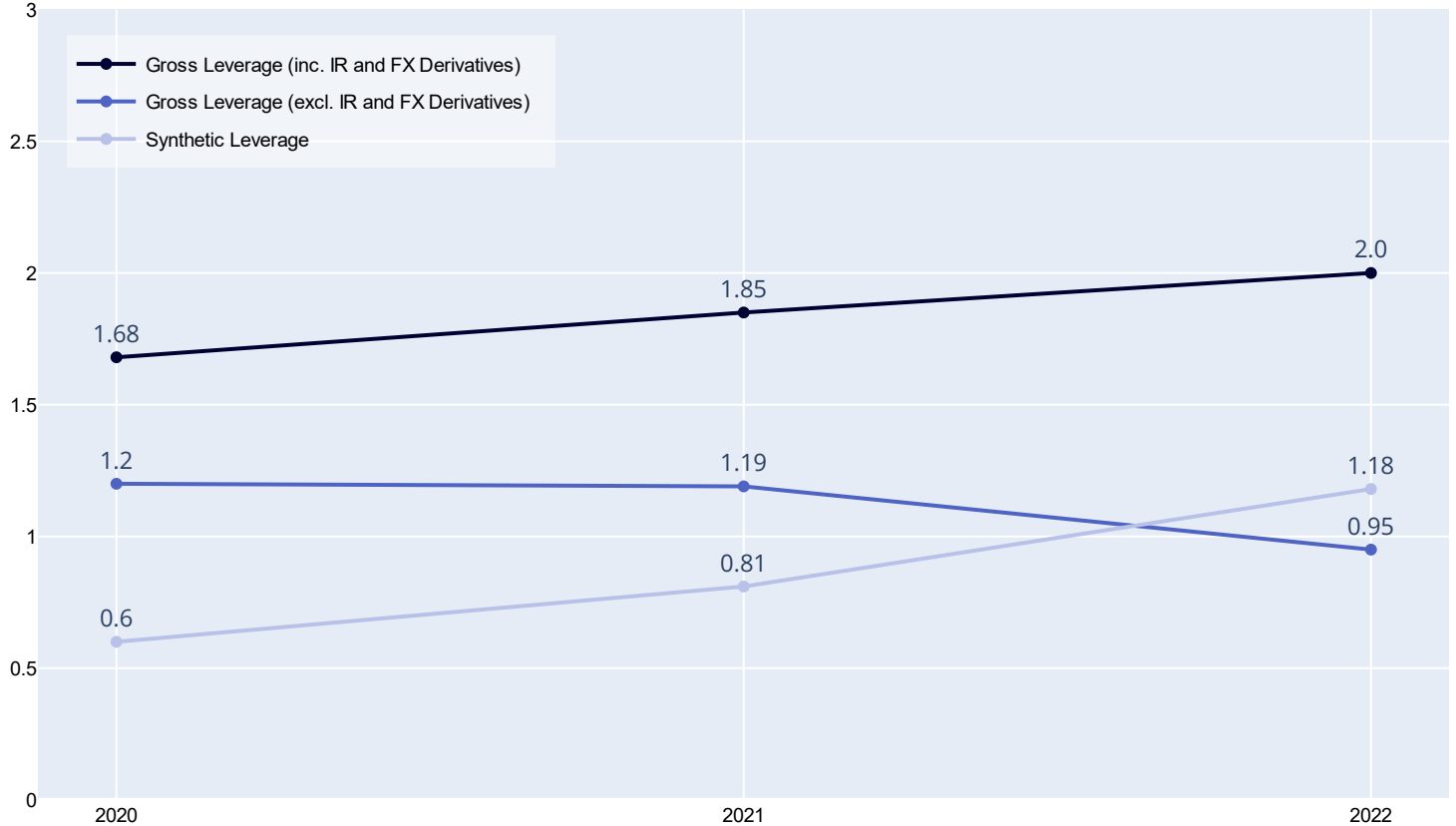
[45] See ESMA report Use of derivatives by UCITS equity funds, November 2019, available at: https://www.esma.europa.eu/sites/default/files/trv_2019_2-use_of_derivatives_by_UCITS_equity_funds.pdf

[46] France, Germany, Ireland, Portugal, Italy, Luxembourg, Netherlands, and Switzerland.

4.6 | Open-Ended Fund Leverage

Leverage Metrics of Open-Ended Funds

Fig.30: Aggregate leverage metrics of open-ended funds.



For OEFs, leverage is calculated as described in Section 3.6. Gross leverage remains low on aggregate, standing at 2x NAV. Excluding IR and FX derivatives, gross leverage stands at 0.95x NAV. Synthetic leverage stands at 1.18x NAV and is primarily made up of IR and FX derivatives, with the difference between gross and synthetic leverage being leverage from OEFs' asset class exposures^[47].

Year-over-year comparison:

Looking at Figure 30, OEFs' gross leverage is increasing. In comparison to 2021, gross leverage has increased 8.1%, however, when IR and FX derivatives are excluded there is a 20% decline in gross leverage. There is also a substantial increase in synthetic leverage, compared to 2021 synthetic leverage increased 45.7%. As seen in Section 4.5, the large increase in IR derivatives is driving the increase in synthetic leverage and gross leverage. Even with the significant increase in gross leverage, all leverage measures for OEFs remain low.

[47] This may include assets acquired through borrowing.

Total Aggregate Borrowing

Fig.31: Total aggregate cash and securities borrowings of open-ended funds^[48].

Note: Cash borrowings include borrowing from reverse repo transactions.

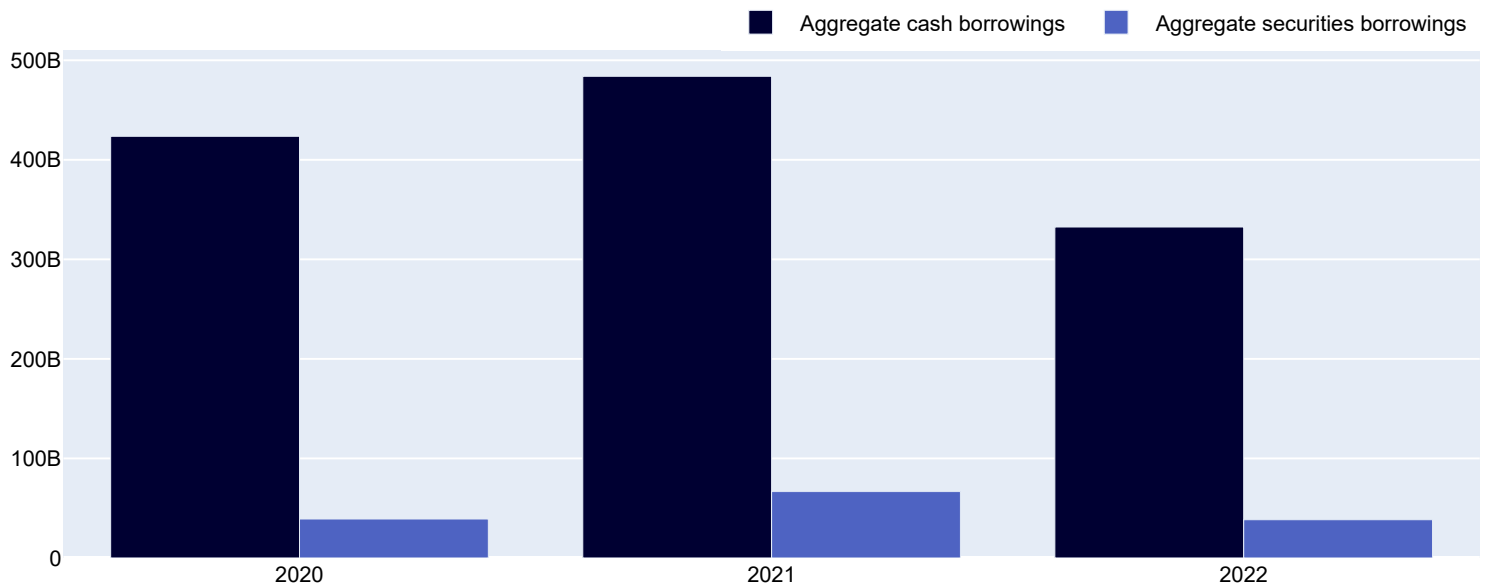


Figure 31 describes the aggregate borrowings for OEFs. OEF borrowing is small, equating to 0.86% of total aggregate NAV.

Year-over-year comparison:

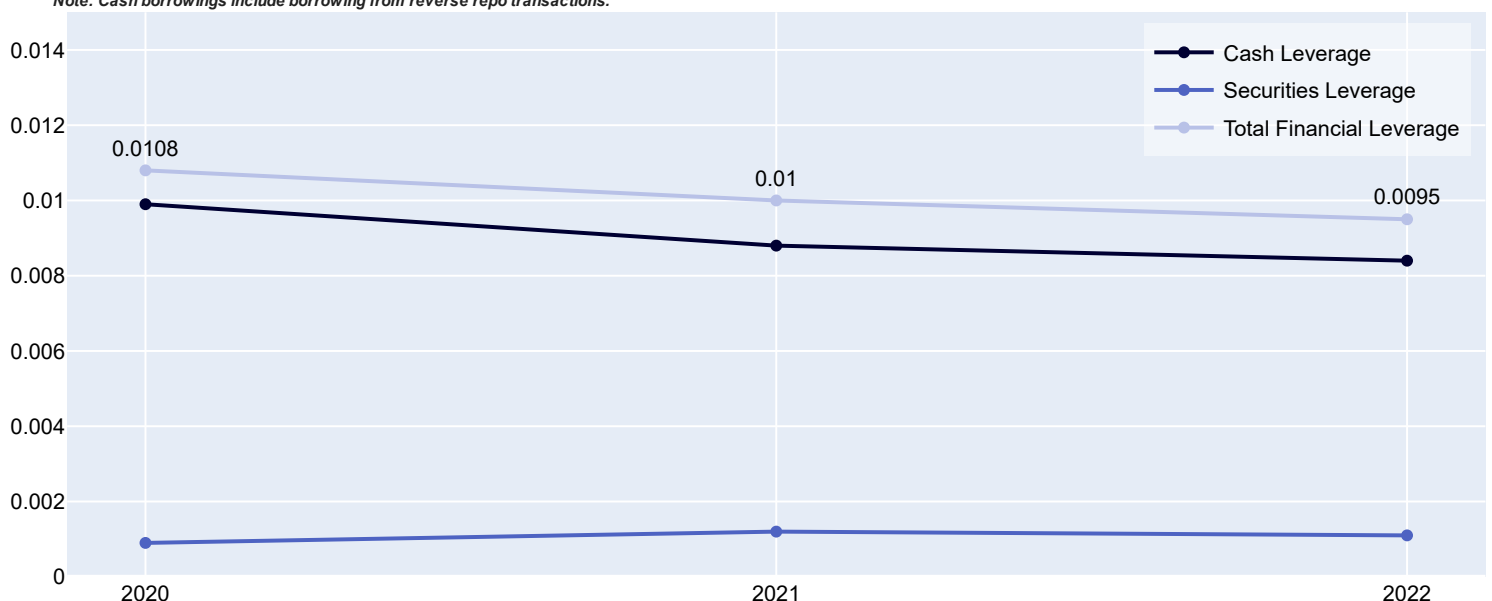
While there is a significant reduction in borrowing for both cash and securities from the 2021 reporting year, on an equivalent basis there is only a slight drop in financial leverage as depicted in Figure 32. Further, on an equivalent basis, cash borrowing has decreased while securities borrowing has remained equal. Overall, financial leverage remains very low for OEFs, standing at 0.0095x NAV (0.95%).

Data collected on posted collateral totals USD 96.7B. When comparing with jurisdictions who provided data on borrowing and collateral, collateral posted corresponds to 78.5% of total borrowing by these jurisdictions. However, without a further breakdown of collateral by securities financing transactions, the true level of collateralization on total borrowing cannot be determined.

Financial Leverage

Fig.32: Aggregate cash and securities financial leverage by open-ended funds as a multiple of total aggregate NAV.

Note: Cash borrowings include borrowing from reverse repo transactions.



[48] Due to lack of availability, borrowing figures do not include US data.

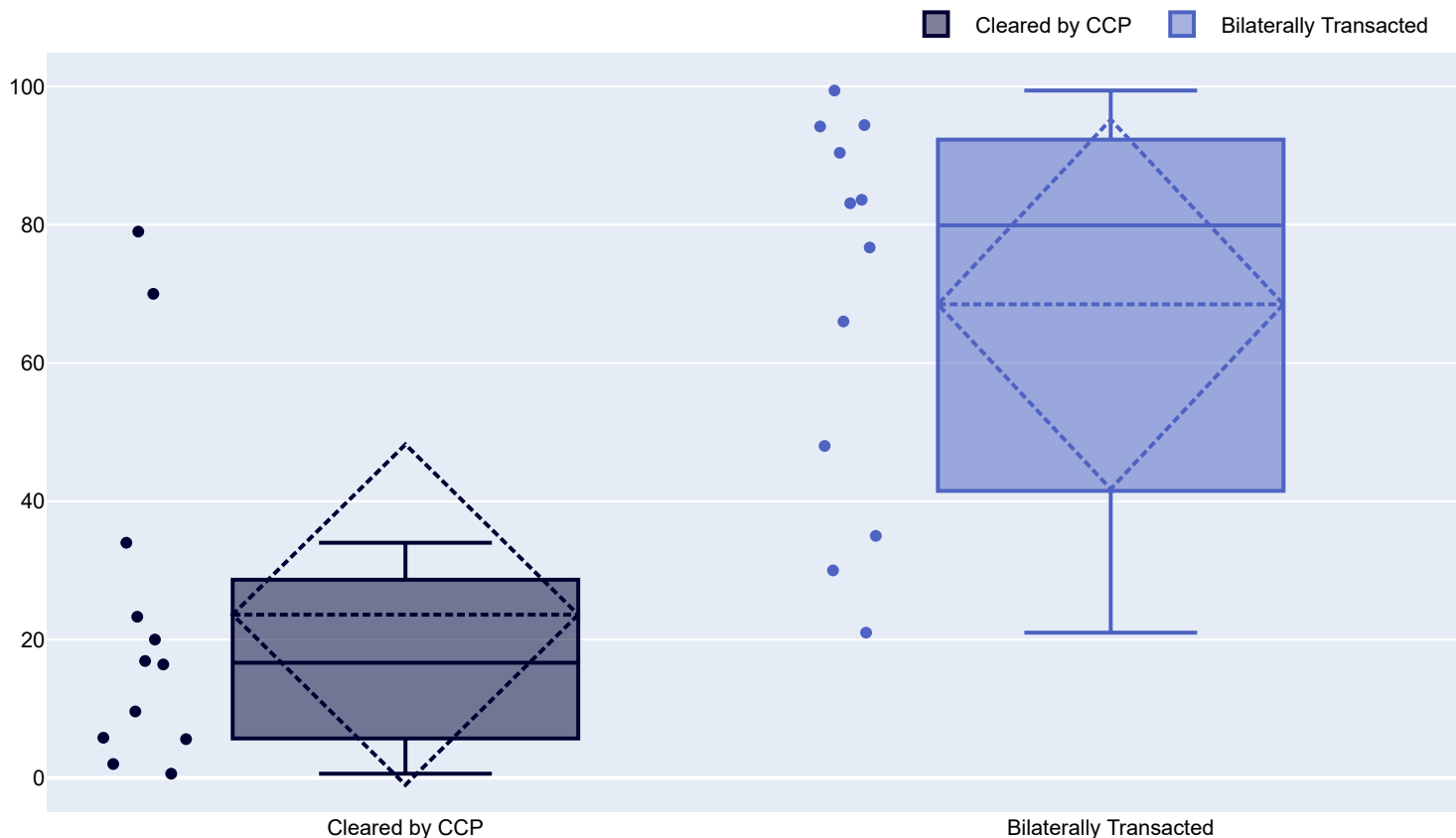
4.7 | Open-Ended Fund Counterparty and Liquidity Risk

Centrally Cleared vs. Bilaterally Cleared

Fig.33: Box plot showing the spread of centrally cleared vs. bilaterally transacted percentages for each jurisdiction's open-ended funds for 2022.

Note: The box plot shows the interquartile range (IQR), lower fence ($Q1 - 1.5 * IQR$), upper fence ($Q3 + 1.5 * IQR$), upper quartile - (Q3), lower quartile (Q1), and the median (solid line).

Additionally, the dotted line represents the mean, and the dotted triangles represent the standard deviation.

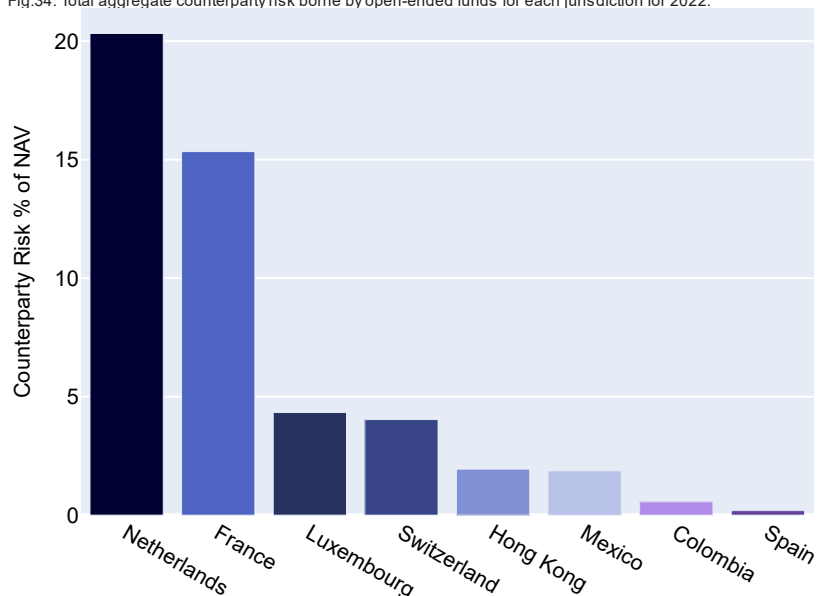


Similar to the findings for QHFs, Figure 33 shows OEFs primarily conduct their OTC derivatives trades bilaterally. Data collected encompassing 30% of OEFs' total aggregate NAV shows, on average, 68% of OEFs' trades are transacted bilaterally, and 23% of OEFs' trades are cleared through a CCP. The median for clearing through a CCP is lower at 17%, and the median for transacting bilaterally is higher at 80%. The median percentages suggest that four out of five OEFs' OTC derivatives trades are transacted bilaterally. Given the small amount of collateral detailed in Section 4.5, bilateral transactions could pose a higher risk than clearing through a CCP. Though without further information on margin, or the ability to assess concentration amongst counterparties, it is difficult to garner the full extent of the risk associated with this level of bilateral transactions.

Figure 34 describes each jurisdiction's total counterparty risk borne by OEFs as a percentage of total aggregate NAV. The breakdown denotes each jurisdiction's exposures to counterparties, and provides greater insight to the extent of which bilateral transactions may be a risk for each jurisdiction. The figure indicates that the majority of the jurisdictions are not highly exposed to counterparties, and overall counterparty risk is low. Further this suggests that the level of bilateral transactions by OEFs does not pose a significant risk.

Open-Ended Fund Counterparty Risk

Fig.34: Total aggregate counterparty risk borne by open-ended funds for each jurisdiction for 2022.



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 support financial stability. At this time, the availability of OEF liquidity data is not representative of the OEF industry as a whole. As jurisdictions improve their ability to collect OEF liquidity data through changes to their reporting framework, the report will better be able to analyze OEF liquidity.

5. CLOSED-ENDED FUNDS

Gross Leverage Continues to Decline Since 2020

The report provides an overview and assessment of the leverage within the closed-ended funds industry. This section relies on CEF data from IOSCO member submissions for December 31, 2022. The survey encompasses data on 25,139 CEFs with a total aggregate NAV of USD 3.55T from 17 jurisdictions around the world.

For the 2022 investment funds survey there is a decline in total aggregate NAV and in the number of funds reported compared to the 2021 reporting year. This is, in part, due to receiving data from 5 fewer jurisdictions data for the 2022 reporting year, a 23% decrease in participation year-over-year.

Total number of funds reported increased by 4.7%. When looking at the total number of funds reported on an equivalent basis, excluding jurisdictions who had submitted data for the 2021 reporting year and not the 2022 reporting year, there is a 7% increase overall.

Total aggregate NAV for the 2022 reporting year has fallen 5% in comparison to the 2021 reporting year, and when adjusting for the equivalent NAV there is a 3% decrease in total aggregate NAV for the 2022 reporting year.

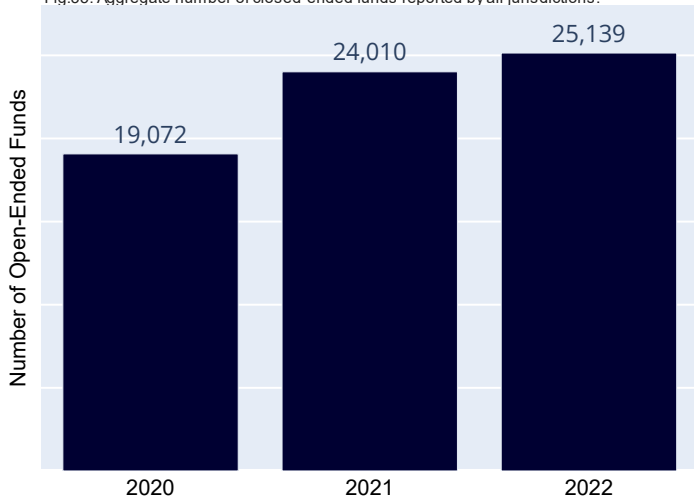
Luxembourg accounts for 16% of the CEFs captured in this report, and 24% of the total aggregate NAV. Including the UK and Brazil, these three countries represent 62% of the CEFs, and 49% of the total aggregate NAV. Therefore, these three countries represent a significant portion of the data in this section.

Overall, an increase in gross leverage is observed for CEFs. Like QHFs and OEFs, financial leverage remains low and CEFs primarily conduct their OTC derivatives trades bilaterally rather than through a CCP.

5.1 | Closed-Ended Fund Aggregate Data

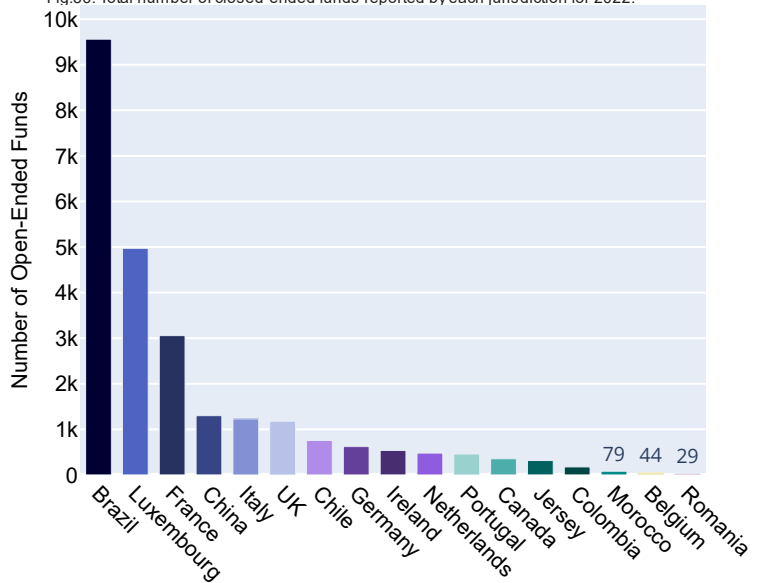
Total Closed-Ended Funds

Fig.35: Aggregate number of closed-ended funds reported by all jurisdictions.



Closed-Ended Funds by Jurisdiction

Fig.36: Total number of closed-ended funds reported by each jurisdiction for 2022.



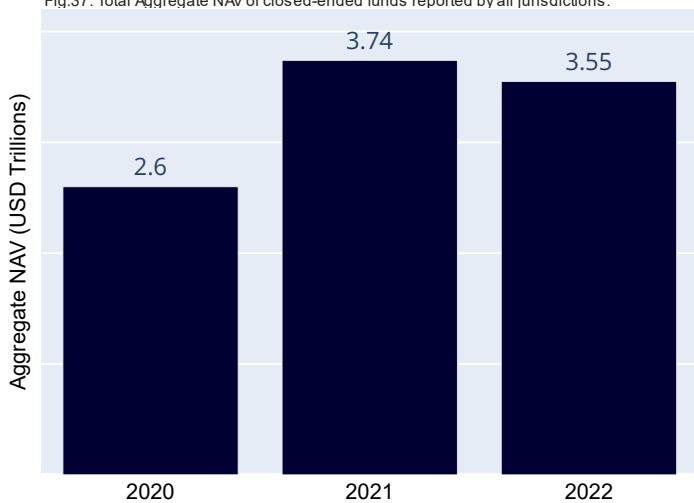
Year-over-year comparison:

Total CEFs reported increased by 4.7%, and looking at the top five jurisdictions, four of the five have reported substantial increases: Brazil (+1,618), Luxembourg (+918), France (-1,970)^[49], China (+125), and Italy (+350). Overall, comparing the jurisdictions that had reported in 2021 and have reported for 2022, there is an increase of 7%, and a weighted-average increase of 13%, suggesting that the jurisdictions with more CEFs are increasing significantly.

Like OEFs, total aggregate NAV for CEFs decreased by 5% from the 2021 reporting year, and when taking into account the jurisdictions' who had not reported for 2022, there is a 3% decline in total aggregate NAV. This is largely due to the decline in France (-60%) following a widespread reclassification of funds. Romania and the Netherlands aside, the remaining jurisdictions' total aggregate NAV increased substantially, and on a weighted-average basis total aggregate NAV increased by 12.5%.

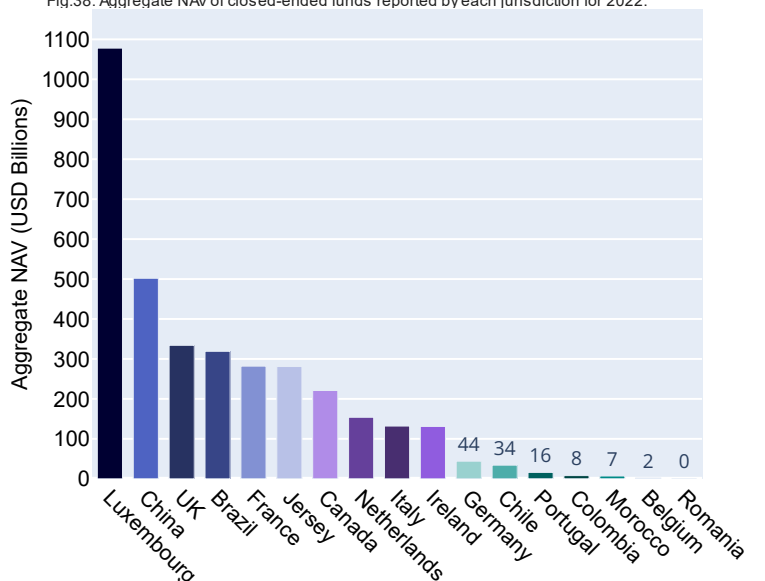
Total Aggregate NAV

Fig.37: Total Aggregate NAV of closed-ended funds reported by all jurisdictions.



Aggregate NAV by Jurisdiction

Fig.38: Aggregate NAV of closed-ended funds reported by each jurisdiction for 2022.



[49] The decline in CEFs for France is a result of better classification of open-ended funds, supra fn 5.

5.2 Closed-Ended Fund Type

Percentage of NAV by Fund Type

Fig.39: Aggregate NAV of closed-ended funds as a percentage of total NAV broken down by fund type for 2022.

Fund Type

- Other
- Private Equity Funds
- Real Estate Funds

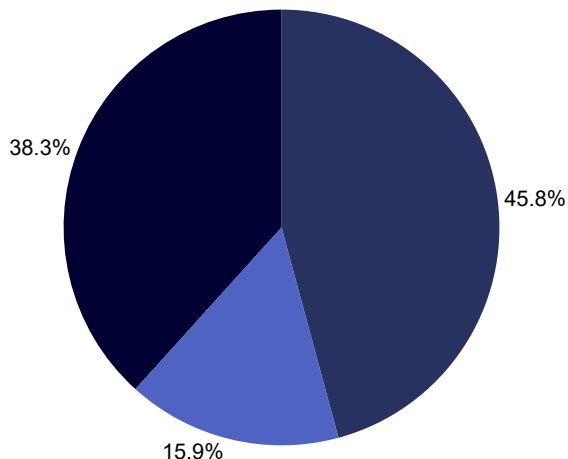


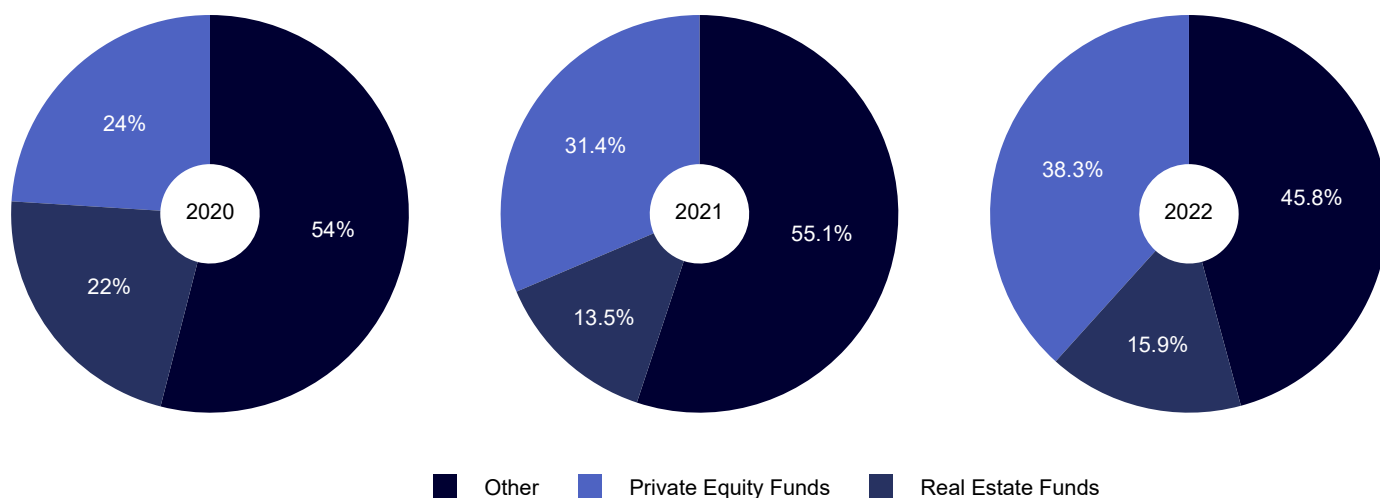
Figure 39 describes the breakdown of CEF type. About 84% of the CEFs are split between Private Equity (PE) funds and Other. This is an important distinction due to the nature of PE funds, which have little to no reporting and disclosure transparency^[50]. Within the context of the IFSR, transparency can be seen as a relevant issue given that more granular reporting for these types of funds is not available. It is important to keep in mind that the data presented may not be reflective of the entire industry's leverage due to the lack of transparency in PE funds.

Year-over-year comparison:

Compared to the previous two iterations of the IFSR which had collected data of CEFs, there is a large shift from the Other category into PE funds. This may be a result of better classification by jurisdictions. When comparing to 2021, there is 22% growth in PE funds and 18% growth in Real Estate funds.

Fund Type: Year-Over-Year Comparison

Fig.40: Aggregate NAV of closed-ended funds as a percentage of total NAV broken down by fund type.



[50] See FR10/23 Thematic Analysis: Emerging Risks in Private Finance, Final Report, Report of the Board of IOSCO, September 2023, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD745.pdf>

5.3 Closed-Ended Fund Geographical Investment Area

Total NAV by Geographical Investment Area

Fig.41: Total Aggregate NAV of closed-ended funds by Geographical Investment Area for 2022.

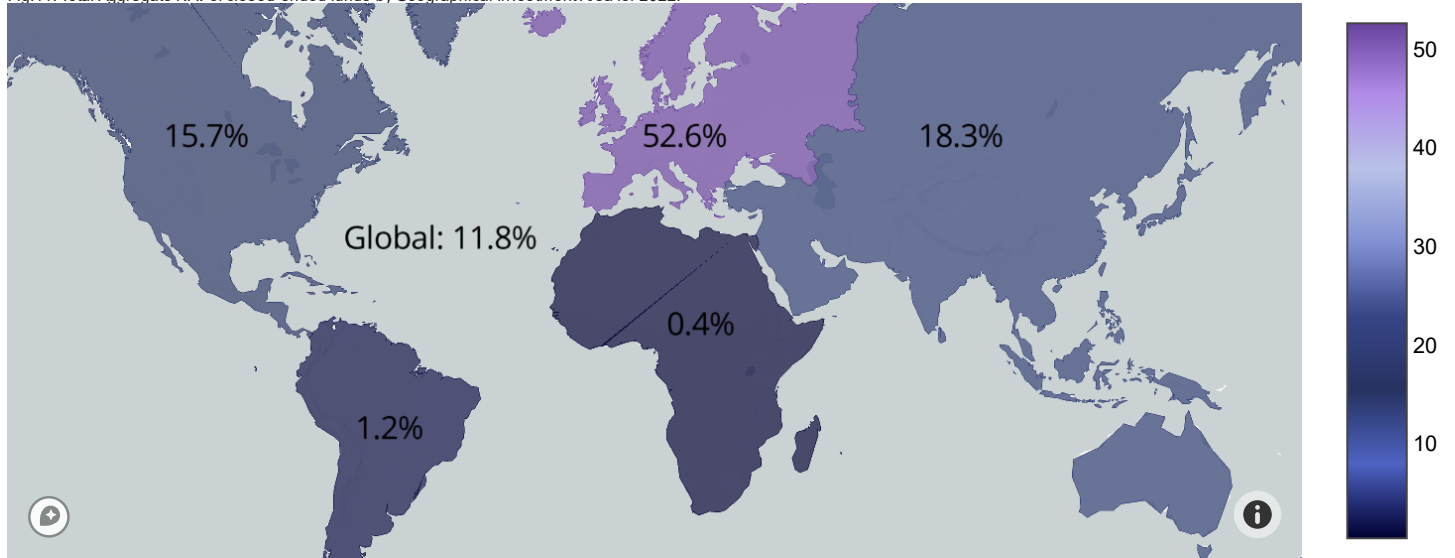


Figure 41 details CEFs' geographical investment focus. The heavy investment focus in Europe (~53%) is representative of the large number of jurisdictions surveyed being EU countries. Besides Europe, Asia and Pacific is the second largest investment focus area (~18%), and North America is the third largest (~16%).

Total NAV by Geographical Investment Area and Jurisdiction

Fig.42: Total NAV of closed-ended funds by geographical investment focus for each jurisdiction for 2022.

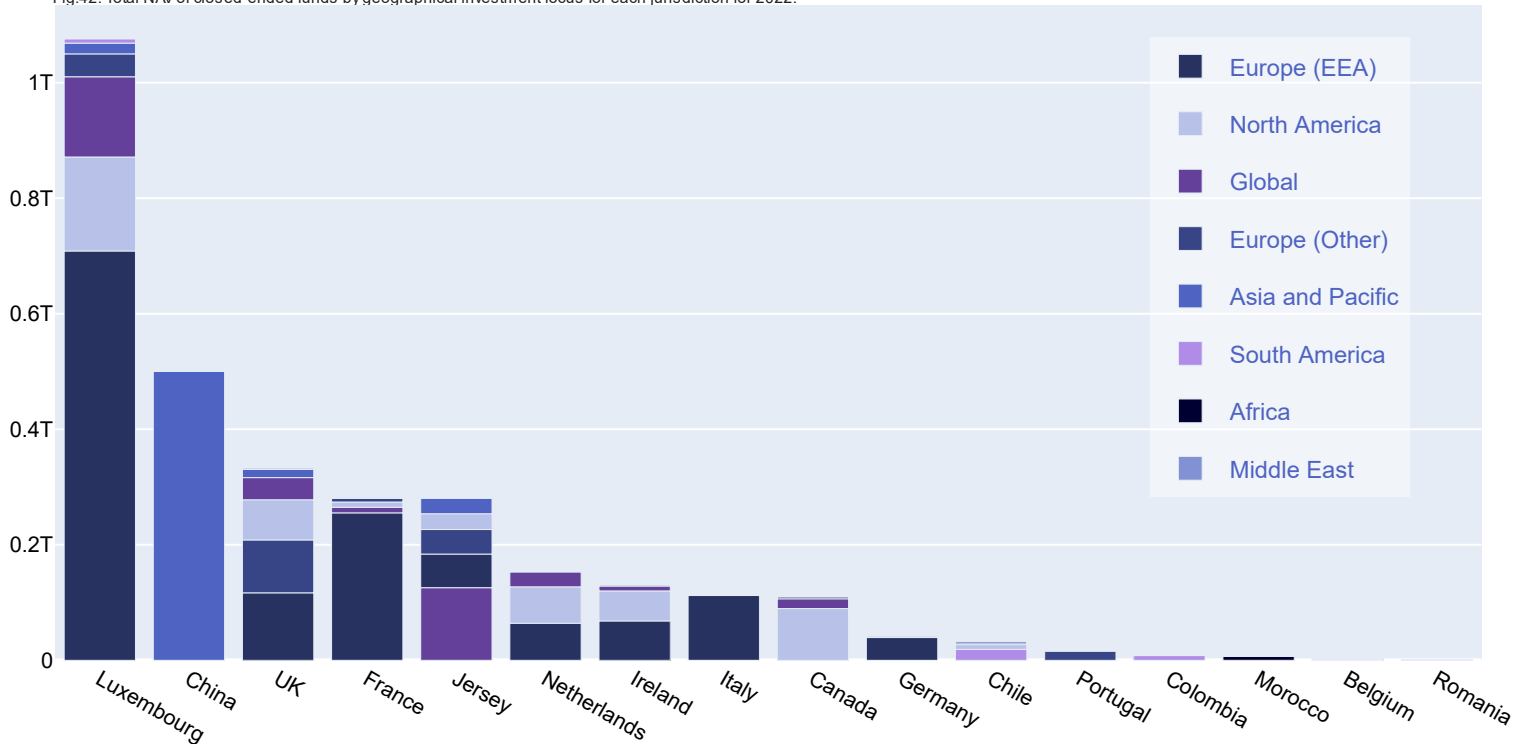
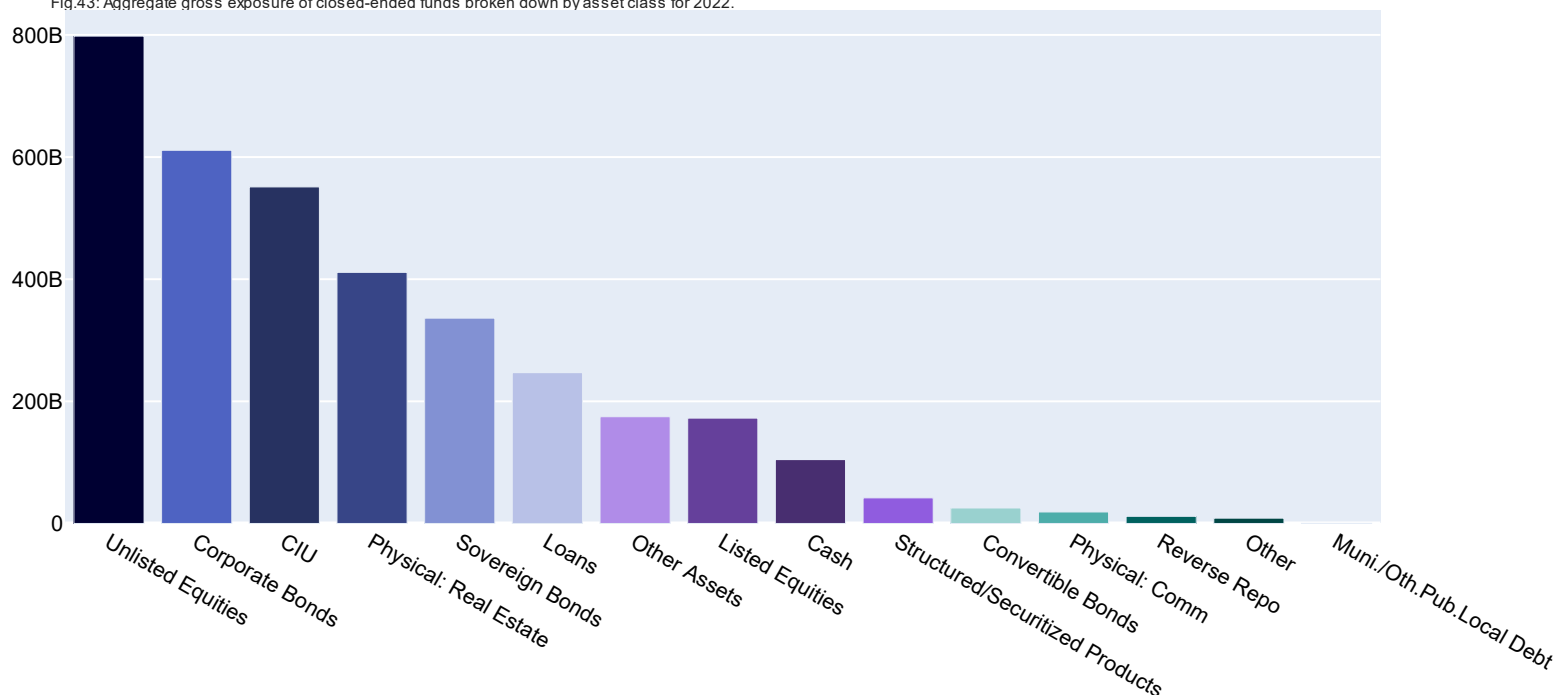


Figure 42 describes the geographical investment focus by jurisdiction. Similar to OEFs as described Section 4.3, European CEFs have the largest investment focus in Europe (EEA). Additionally, Luxembourg, Ireland and the Netherlands have large investment focus in North America and Globally. China has the largest investment focus in Asia and Pacific, followed by Jersey and Luxembourg.

5.4 Closed-Ended Fund Asset Class Exposure

Gross Asset Class Exposure

Fig.43: Aggregate gross exposure of closed-ended funds broken down by asset class for 2022.



CEFs hold few short positions across the asset classes. In total, short positions for all asset classes represent less than 1% of total aggregate NAV. Therefore, gross exposure is provided in Figure 43 rather than a breakdown of long and short exposures.

CEFs are largely exposed to Unlisted Equities, and this corresponds with the large proportion of PE funds as noted in Section 5.2. Appendix 3 provides a more detailed table of CEFs' asset class exposures. From Table 6 in Appendix 3, Unlisted Equities are observed to be approximately 23% of CEFs' total aggregate NAV. Further, the growth in Real Estate funds as described in Section 5.2, also corresponds to the large exposure to Physical: Real Estate (Real Estate), which represents approximately 12% of CEFs' total aggregate NAV.

Year-over-year comparison:

In comparison to previous iterations of the IFSR, there continues to be a large amount of exposure to Equities, Corporate Bonds, Collective Investment Undertakings (CIUs), and Real Estate. In 2022, exposure to Corporate Bonds increased significantly by approximately USD 200 billion, representing a 55% growth compared to the previous year.

Combining Unlisted and Listed Equities to compare with the 2021 reporting year, CEFs have approximately 28% of total aggregate NAV exposed to Equities, and in comparison to the 2021 reporting year, this corresponds to about a 12% decline in exposure to Equities as a percentage of total aggregate NAV. Conversely, exposure to Real Estate has increased approximately 4.8%, accounting for 11.5% of total aggregate NAV in 2022.

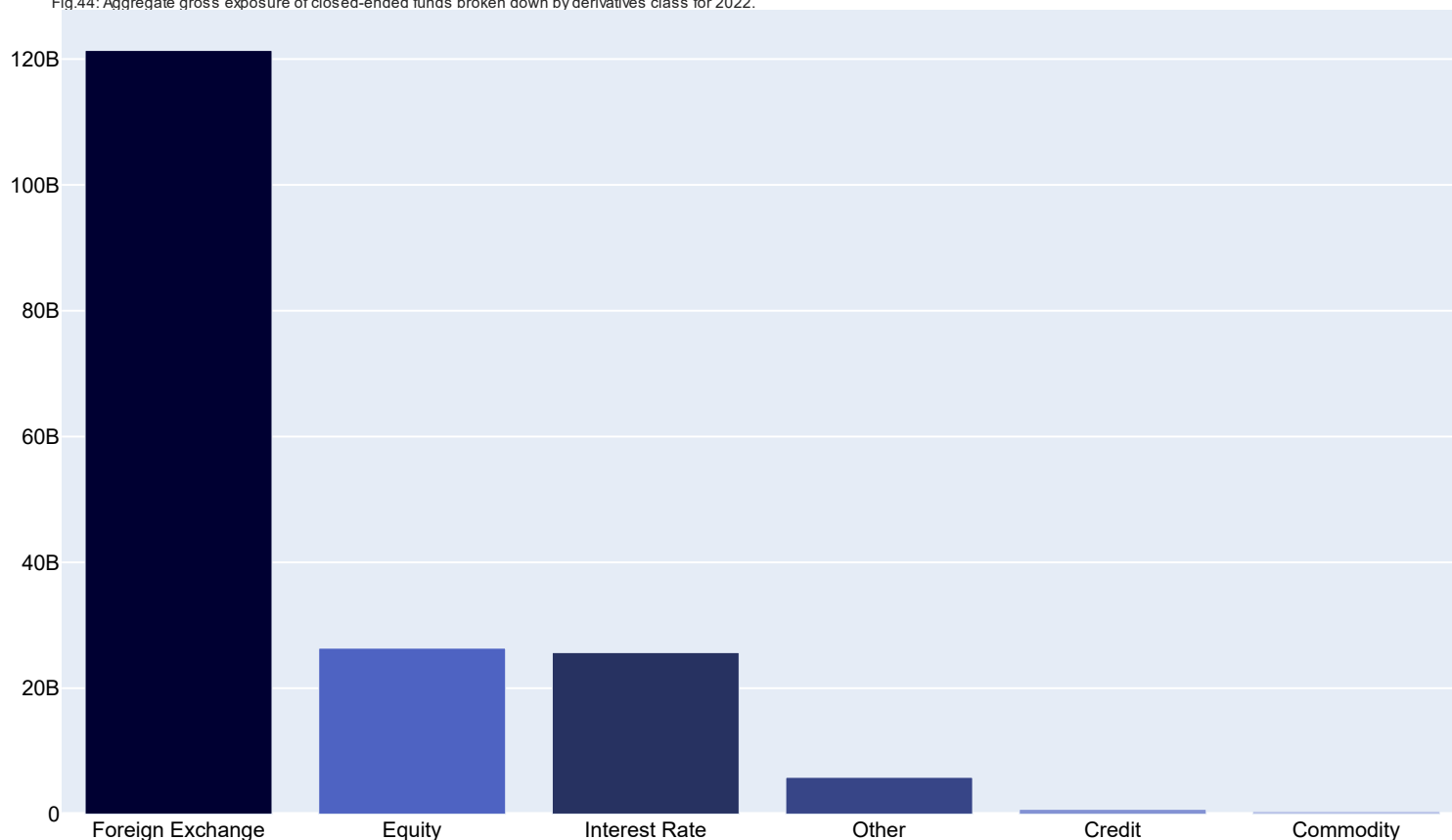
Conversely, exposure to Real Estate has increased approximately 3.5%, accounting for 15% of total aggregate NAV in 2022. Similarly, exposure to CIUs has increased 2%, accounting for 20% of total aggregate NAV.

Thus, although a large growth in PE funds is observed in Section 5.2, it appears that as a percentage of total aggregate NAV, exposure to Equities is falling, whereas, the growth in Real Estate funds is substantiated by growth in exposure to Real Estate.

5.5 Closed-Ended Fund Derivatives Exposure

Gross Derivative Exposure

Fig.44: Aggregate gross exposure of closed-ended funds broken down by derivatives class for 2022.



Similar to asset class exposures, CEFs are primarily long derivatives. CEFs' total short GNE represents an inconsequential 0.48% of total aggregate NAV, primarily consisting of short FX derivatives exposure which accounts for 0.26%. Therefore, the GNE of derivatives classes is exhibited in Figure 44 rather than a breakdown of long and short exposures.

Unlike QHFs and OEFs, CEFs are primarily long FX derivatives rather than IR derivatives. Further, CEFs are not highly exposed to derivatives overall, with FX derivatives accounting for only 3.4% of total aggregate NAV.

Year-over-year comparison:

Total derivatives exposure as a percentage of total aggregate NAV remains low, however, when comparing with the 2021 reporting year there is a significant shift from IR derivatives to FX derivatives. On an equivalent basis, comparing jurisdictions who reported for both the 2021 reporting year and 2022 reporting year, the exposure of FX derivatives has increased by 52%, and the exposure of IR derivatives has decreased by 52%.

Equity and Credit derivatives have also fallen substantially; Equity derivatives decreased by 81% and Credit derivatives decreased by 96% in 2022. This is driven by a 100% decrease in Credit derivatives GNE for Ireland, and a 98% decrease in Equity derivatives GNE and Credit derivatives GNE for France^[51].

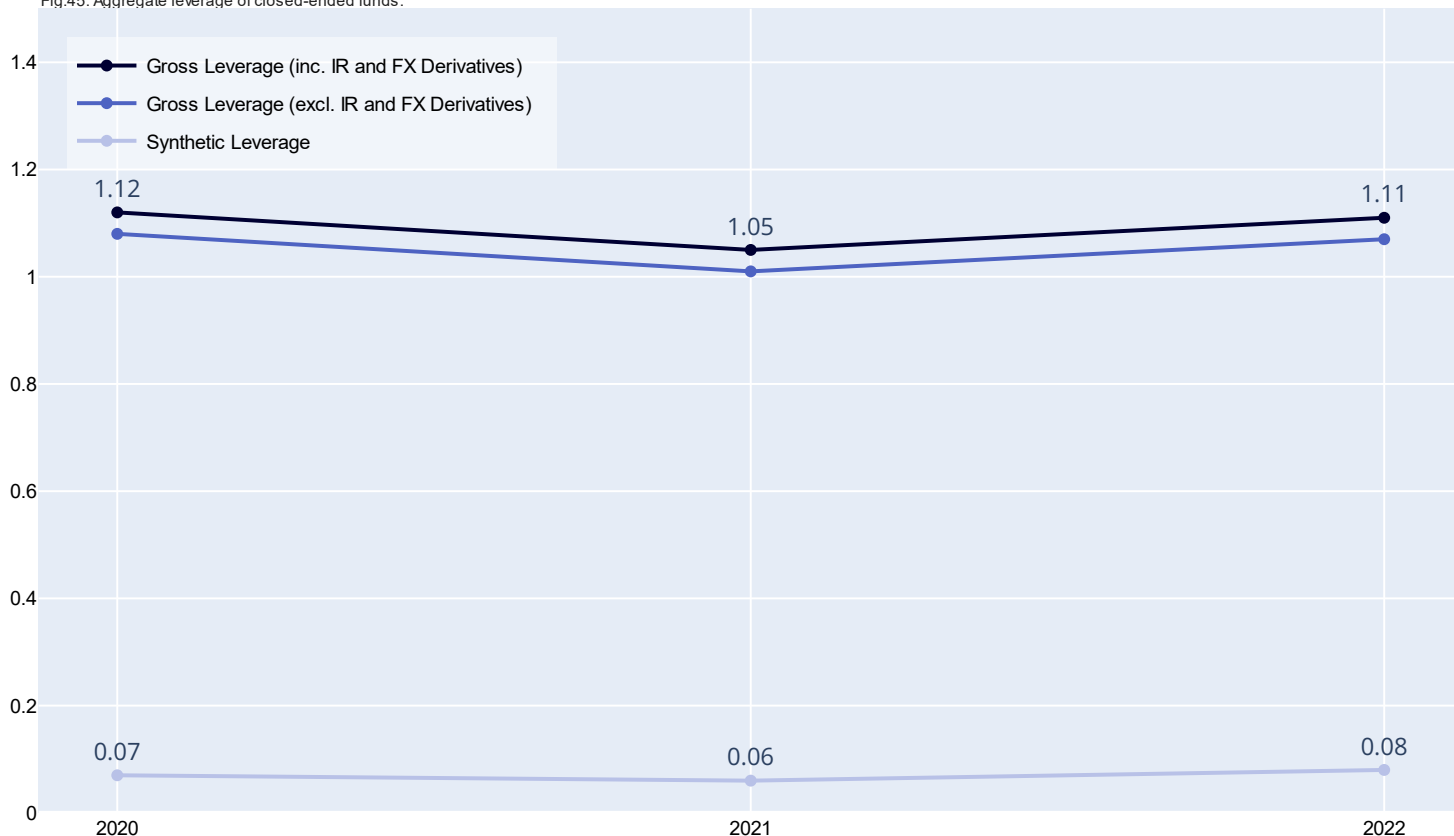
See Appendix 3 for a table with all CEF exposures.

[51] The large decrease is a result of better classification of OEFs, supra fn 5.

5.6 Closed-Ended Fund Leverage

Leverage Metrics of Closed-Ended Funds

Fig.45: Aggregate leverage of closed-ended funds.



Similar to QHFs and OEFs, leverage is calculated as per the description in Section 3.6. Although IR and FX derivatives do not represent a large proportion of CEFs' total aggregate NAV, gross leverage is also calculated excluding IR and FX derivatives for consistency and comparability across fund types. Gross leverage for CEFs stands at 1.11x NAV, and when excluding IR and FX derivatives, gross leverage stands at 1.07x NAV. Synthetic leverage stands at 0.08x NAV (8%) and remains low due to the small amount of derivatives exposure as described in Section 5.5.

Year-over-year comparison:

Gross leverage for CEFs has increased significantly from the 2021 reporting year, though remains low. In comparison to 2021, gross leverage increased 5.7% in 2022. Synthetic leverage increased significantly by 33%, though it remains very low and insignificant overall.

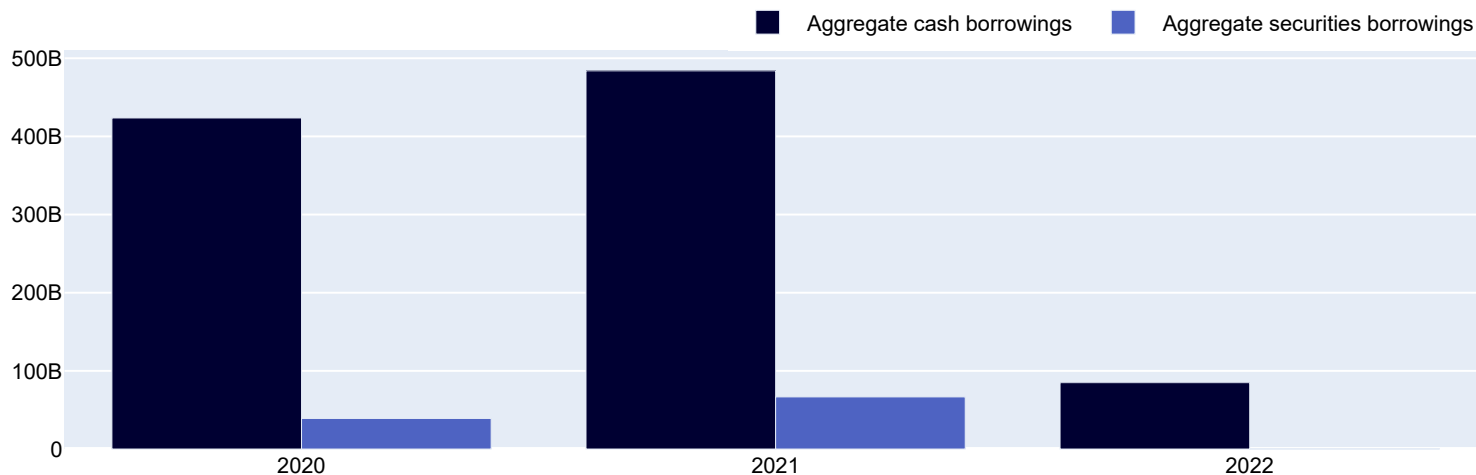
It is important to note that despite the low leverage across all measures for CEFs, due to the large proportion of PE funds, there may exist a significant amount of "hidden leverage", whereby the leverage is not directly attached to the fund, but resides on the balance sheets of the fund's portfolio of companies and other special purpose acquisition companies^[52].

[52] See FR06/23 Special Purpose Acquisition Companies, Final Report, Report of the Board of IOSCO, May 2023, available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD732.pdf>

Total Aggregate Borrowing

Fig.46: Total aggregate cash and securities borrowings of closed-ended funds.

Note: Cash borrowings include borrowing from reverse repo transactions.



As with OEFs, CEFs borrowing is small compared to total aggregate NAV. Notwithstanding, there remains some borrowing by CEFs as described in Figure 46. For the 2022 reporting year, total aggregate borrowing by CEFs represents 2.8% of total aggregate NAV.

Year-over-year comparison:

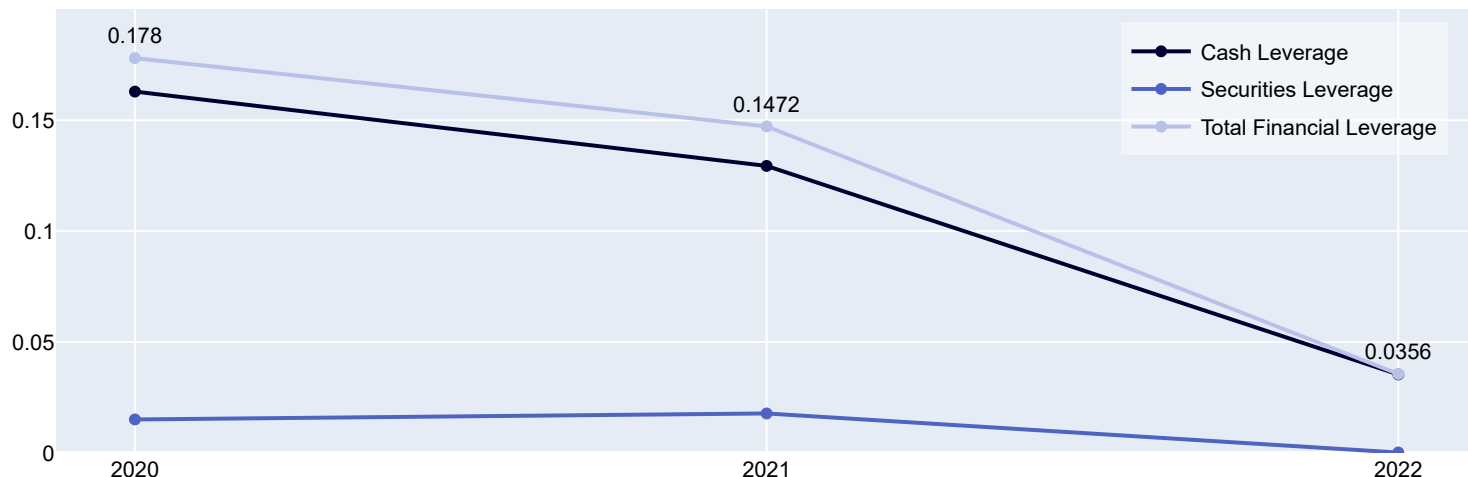
Figure 46 shows that borrowing has declined significantly from the 2021 reporting year. However, a significant portion of the decline is a result of missing data from jurisdictions who had reported in the 2021 reporting year and not the 2022 reporting year. On an equivalent basis, comparing funds who provided data for the both the 2021 and 2022 reporting years, there is a 10% increase in total borrowing. Despite the increased borrowing on an equivalent basis, Figure 47 shows that financial leverage has also declined substantially from the 2021 reporting year. For 2022, financial leverage fell by 76% to 0.0356x NAV (3.56%).

Compared to the 2021 reporting year, total aggregate borrowing as a percentage of total aggregate NAV has fallen 12%. The decline in Cash Borrowing is primarily driven by decreases in the UK (-38%), France (-18%), and Canada (-27%)^[53], in order of percentage total of aggregate Cash Borrowing. The decline in Securities Borrowing is primarily driven by decreases in Luxembourg (-86%), the UK (-100%), and Brazil (-92%); in order of percentage of total aggregate Securities Borrowing.

Financial Leverage

Fig.47: Aggregate cash and securities financial leverage by closed-ended funds as a multiple of total aggregate NAV.

Note: Cash borrowings include borrowing from reverse repo transactions.



[53] The CEF industry is relatively small in Canada, and shifts in the surveyed data year-over-year may significantly impact borrowing figures.

5.7 Closed-Ended Fund Counterparty Risk

Centrally Cleared vs. Bilaterally Cleared

Fig.48: Box plot showing the spread of centrally cleared vs. Bilaterally Transacted percentages for each jurisdiction's closed-ended funds for 2022.

Note: The box plot shows the interquartile range (IQR), lower fence ($Q1 - 1.5 * IQR$), upper fence ($Q3 + 1.5 * IQR$), upper quartile - (Q3), lower quartile (Q1), and the median (solid line).

Additionally, the dotted line represents the mean, and the dotted triangles represent the standard deviation.

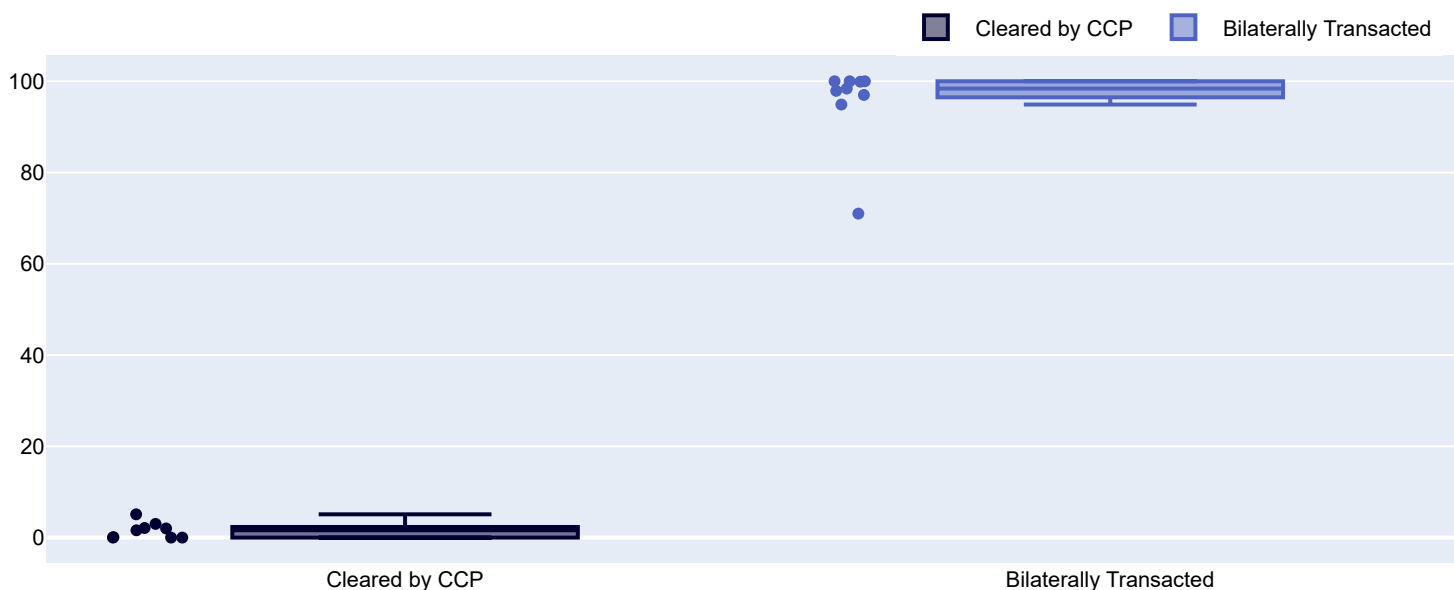


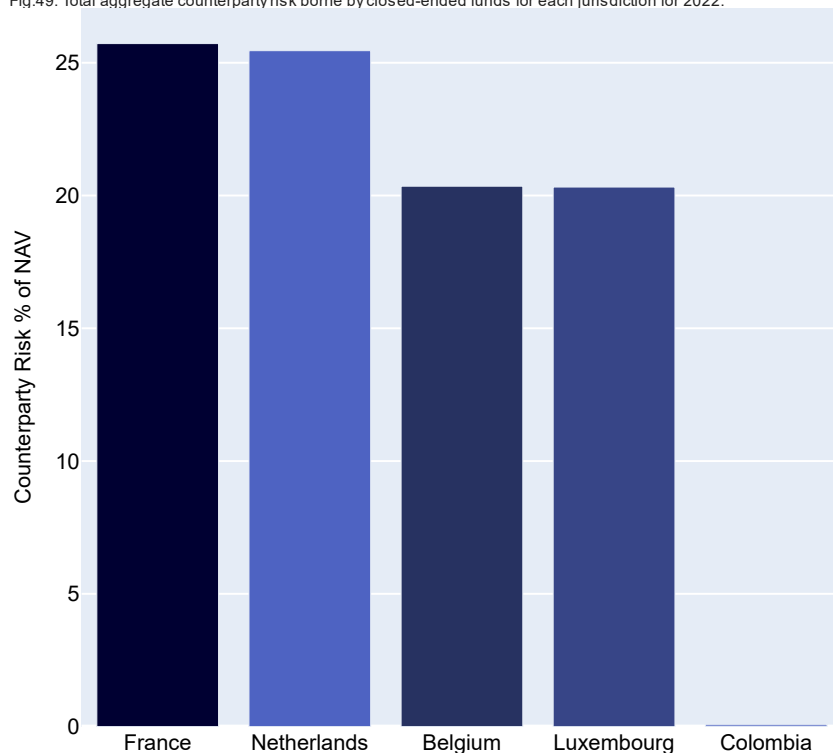
Figure 48 describes on aggregate, CEFs' percentage of OTC derivatives trades which are cleared through a CCP compared to being Bilaterally Transacted. It shows that CEFs primarily conduct their OTC derivatives trades bilaterally. Further, the maximum percentage of trades cleared through a CCP by any jurisdiction was 5%.

Recall from Section 5.5 that CEFs are primarily exposed to FX derivatives, and as per ESMA^[54] firms are only required to clear non-deliverable forwards (NDF) through a CCP. This may explain the small amount of clearing through a CCP by CEFs.

CEFs' counterparty risk is low in comparison to both QHFs and OEFs. The data collected on CEFs' counterparty risk borne by jurisdictions, on aggregate, contains two of the jurisdictions (Luxembourg and France) in the top 4 jurisdictions by total aggregate NAV. Luxembourg and France represent a significant portion of the data for CEFs and Figure 50 shows that the counterparty risk borne by CEFs is low in these jurisdictions. Based on the data received, CEFs are not highly exposed to counterparties, with France being the most exposed at 26% of total aggregate NAV. Therefore, the high level of bilateral transactions by CEFs does not seem to be a significant risk. Without further information on margin and concentration, however, it is difficult to determine the true risk in this area.

Closed-Ended Fund Counterparty Risk

Fig.49: Total aggregate counterparty risk borne by closed-ended funds for each jurisdiction for 2022.



[54] See ESMA Clearing obligation and risk mitigation techniques under EMIR, 2019, available at: <https://www.esma.europa.eu/post-trading/clearing-obligation-and-risk-mitigation-techniques-under-emir>

6. CONCLUSION

In Conclusion

A declining trend in total aggregate NAV is observed across all fund types. When observed on an equivalent basis, for funds who reported for both 2021 and 2022, there exists similar declines in total aggregate NAV. Therefore, declines in total aggregate NAV are not attributed to the decreased number of jurisdictions who reported for 2022.

Gross leverage for OEFs and CEFs increased from 2021, but remain relatively low at 2x NAV and 1.11x NAV respectively. Gross leverage for QHFs continues to be on a declining trend since 2020, standing at 10.3x NAV. For CEFs, there exists the possibility of hidden leverage that may not be observed within Private Equity funds. Further, financial leverage declined across all fund types in line with significant decreases in aggregate borrowing.

In addition, QHFs appear to be adequately able to meet investor liquidity demands on average. However, individual funds may be subject to varying degrees of liquidity mismatch, and the aggregate nature of the data collected may average out funds who are able to meet investors' liquidity demands with funds who are not.

All fund types primarily transact OTC derivatives trades bilaterally, with QHFs utilizing CCPs more than OEFs and CEFs. The significant level of bilateral transactions can give rise to counterparty risk, though on a jurisdictional level there are not any significant exposures to counterparties.

Qualified Hedge Funds:

Overall, there is a reduction in the total number of QHFs and total aggregate NAV. On an equivalent basis, however, no change in total number of hedge funds is observed and aggregate NAV declined.

QHFs' gross leverage continues to decline from 2020 levels and stands at 10.3x NAV, however, when excluding IR and FX derivatives leverage is increasing on aggregate in the other asset classes.

Given the data collected, it appears QHFs, on aggregate, are adequately prepared to meet investors' liquidity demands under normal market conditions. However, this is not necessarily indicative of liquidity demands under stressed conditions and individual liquidity mismatches for each individual fund.

Both QHFs and OEFs remain highly exposed to IR derivatives, though when looking at the leverage of individual jurisdictions, it appears that the majority of the leverage is borne by UK QHFs, with synthetic leverage of about 60x NAV. The use of IR Swaps to hedge sovereign bond positions may overstate some of this leverage, although the BoE finds that UK QHFs tend to use IR derivatives for speculative reasons rather than for hedging purposes. Overall, synthetic leverage continues to decline from 2020 for QHFs and continues to increase from 2020 for OEFs, standing at 7.7x NAV and 1.18x NAV, respectively.

Open-Ended Funds and Closed-Ended Funds:

- OEFs have large exposures in Listed Equities and IR derivatives, whereas CEFs have large exposures to Unlisted Equities and FX derivatives. While CEFs' exposures to Equity as a percentage of total aggregate NAV have declined, their exposures to Corporate Bonds and Real Estate as a percentage of total aggregate NAV have increased.

Gross leverage for both OEFs and CEFs is low at 2x NAV and 1.11x NAV respectively.

CEFs primarily transacted bilaterally for their OTC derivatives trades, but are not as active in OTC derivatives markets as OEFs, and neither OEFs nor CEFs have significant exposures to counterparties on aggregate.

As the report grows and more information is collected on OEFs and CEFs, there will be an increased ability to determine trends and develop insights into these industries. Going forward the survey will seek to improve the transparency where appropriate and able. Further development of reporting requirements around the globe will also lead to better data collection and analysis.

Appendix 1 | NCA Fund Reporting

Fund Reporting by Jurisdiction

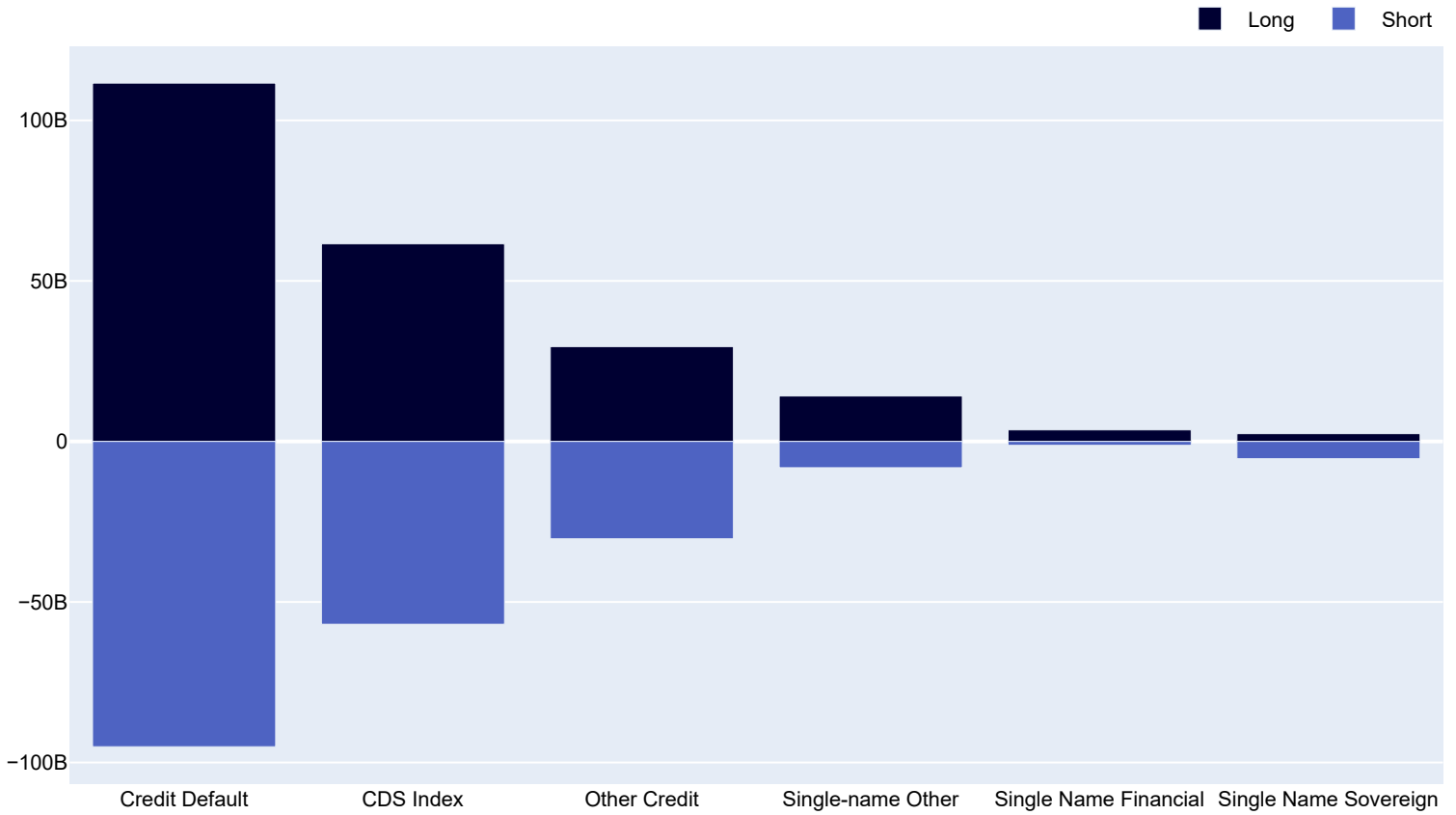
Tab.1: Types of funds reported by national competent authority and jurisdiction for 2022.

Organisation	Jurisdiction	Total NAV Only	HF	OEF	CEF
AMF	France	-	Yes	Yes	Yes
BaFin	Germany	-	Yes	Yes	Yes
CBI	Ireland	-	Yes	Yes	Yes
CSSF	Luxembourg	-	Yes	Yes	Yes
AFM	Netherlands	-	Yes	Yes	Yes
FCA	UK	-	Yes	Yes	Yes
JFSC	Jersey	-	Yes	Yes	Yes
OSC	Canada	-	Yes	Yes	Yes
FINMA	Switzerland	-	Yes	Yes	-
SEC	US	-	Yes	Yes	-
MAS	Singapore	-	Yes	-	-
CVM	Brazil	-	-	Yes	Yes
FSA	Romania	-	-	Yes	Yes
FSMA	Belgium	-	-	Yes	Yes
CONSOB	Italy	-	-	Yes	Yes
AMMC	Morocco	-	-	Yes	Yes
SFC	Colombia	-	-	Yes	Yes
CMVM	Portugal	-	-	Yes	Yes
CMF	Chile	-	-	Yes	Yes
CSRC	China	-	-	Yes	Yes
CNBV	Mexico	-	-	Yes	-
CNMV	Spain	-	-	Yes	-
SFC	Hong Kong	-	-	Yes	-
CNV	Argentina	Yes	-	-	-
CMB	Turkey	Yes	-	-	-
SIMV	Dominican Republic	Yes	-	-	-
SMV	Peru	Yes	-	-	-
JFSA	Japan	Yes	-	-	-

Appendix 2 | Additional Figures

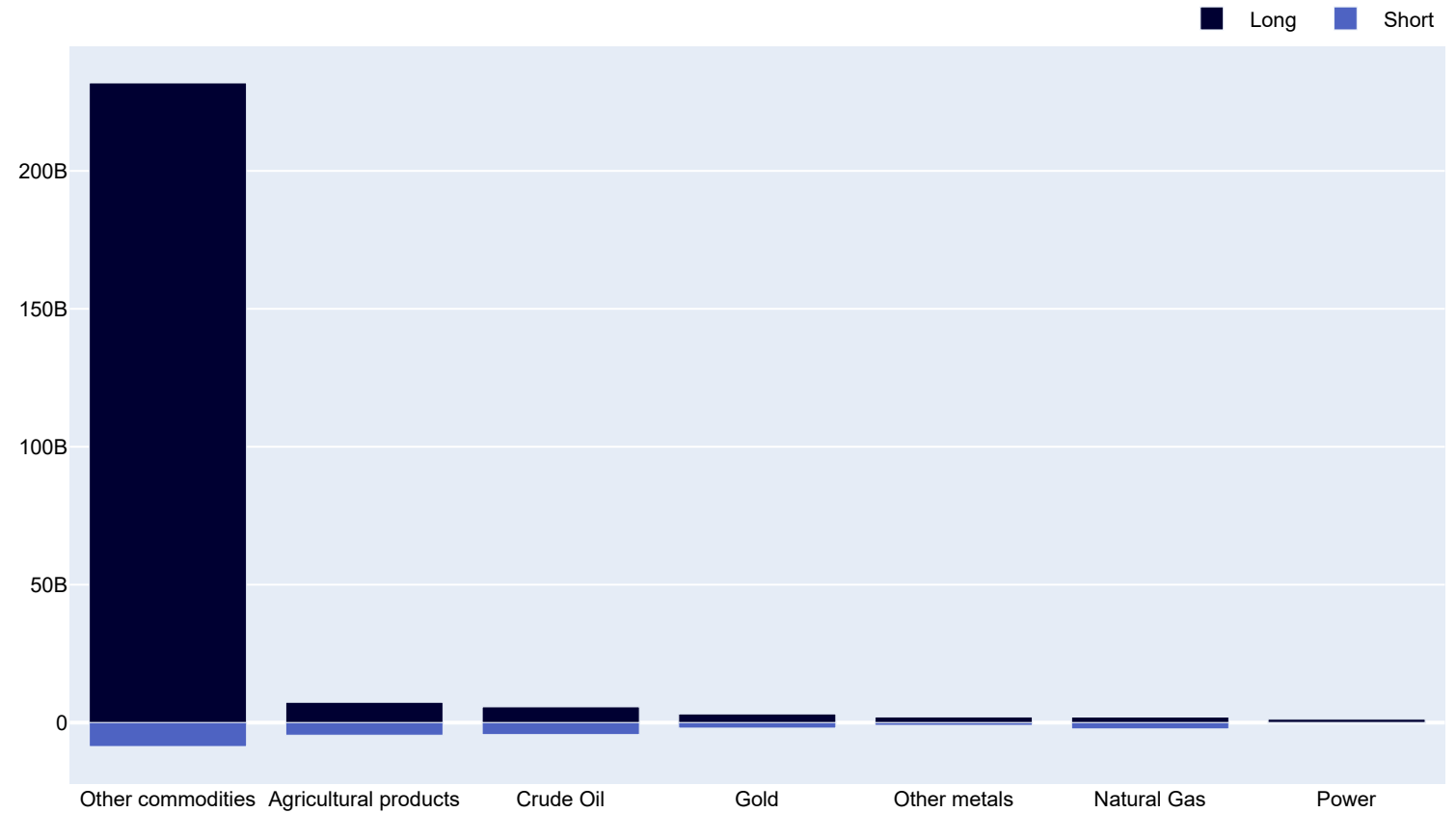
Long/Short Credit Derivatives Exposure

Fig.50: Aggregate long/short exposure of qualified hedge funds broken down by credit derivative type for 2022.



Long/Short Commodity Derivatives Exposure

Fig.51: Aggregate long/short exposure of qualified hedge funds broken down by commodity derivative type for 2022.



Appendix 3 | Additional Tables

Hedge Fund Exposures

Tab.2: Hedge fund exposures broken down by asset class (USD Billions) for 2022.

Asset Class	Long	Short	GNE	Long (% NAV)	Short (% NAV)
CIU	150.4	-6.01	156.41	3.42	-0.14
Cash	903.83	-976.54	1880.37	20.57	-22.23
Convertible Bonds	139.16	-3.41	142.57	3.17	-0.08
Corporate Bonds	295.15	-76.14	371.29	6.72	-1.73
Listed Equities	1808.03	-811.47	2619.49	41.16	-18.47
Loans	462.52	-29.38	491.9	10.53	-0.67
Muni. / Oth. Pub. Local Debt	8.46	-18.42	26.88	0.19	-0.42
Other	101.08	-11.2	112.28	2.3	-0.25
Other Assets	381.38	-106.38	487.76	8.68	-2.42
Physical: Comm	0.18	-3	3.18	0	-0.07
Physical: Real Estate	1.42	-171	172.42	0.03	-3.89
Reverse Repo	1113.9	-992.18	2106.09	25.36	-22.58
Sovereign Bonds	2285.57	-1633.38	3918.95	52.03	-37.18
Structured/Securitized Products	269.52	-48.54	318.06	6.14	-1.1
Unlisted Equities	517.82	-1.1	518.92	11.79	-0.03
Interest Rate Derivatives	21588.59	-3711.67	25300.26	491.42	-84.49
Foreign Exchange Derivatives	2561.47	-1707.86	4269.33	58.31	-38.88
Equity Derivatives	1060.61	-1080.59	2141.2	24.14	-24.6
Other Derivatives	556.66	-135.69	692.35	12.67	-3.09
Commodity Derivatives	461.55	-241.46	703.01	10.51	-5.5
Credit Derivatives	328.9	-470.86	799.76	7.49	-10.72

Hedge Fund Leverage

Tab.3: Hedge fund leverage broken down by jurisdiction for 2022.

Asset Class	Number of Qualifying Hedge Funds	Aggregate NAV (USD Millions)	Gross Leverage (inc. IR and FX Derivatives)	Gross Leverage (excl. IR and FX Derivatives)	Synthetic Leverage
US	2,040	3,771,000	6.28	3.48	3.68
UK	154	342,595	60.06	6.87	56.5
France	61	6,426	3.11	3	2.34
Luxembourg	43	75,730	1.73	1.22	0.7
Singapore	35	61,783	6.89	3.46	5.43
Canada	34	28,407	6.89	5.18	3.97
Switzerland	30	71,388	8.19	2.21	6.45
Ireland	25	28,920	2.94	1.44	1.83
Netherlands	19	2,385	11.14	4.92	9.65
Jersey	18	8,757	-	-	-
Germany	9	4,486	1	1	0.01

Open-Ended Fund Exposures

Tab.4: Open-ended fund exposures broken down by asset class (USD Billions) for 2022.

Asset Class	Long	Short	GNE	Long (% NAV)	Short (% NAV)
CIU	2197.89	-0.77	2198.66	4.73	0
Cash	2200.24	-63.61	2263.86	4.74	-0.14
Convertible Bonds	106.17	0	106.17	0.23	0
Corporate Bonds	4743.64	-7.65	4751.3	10.21	-0.02
Listed Equities	23956.37	-38.17	23994.54	51.56	-0.08
Loans	732.92	-16.44	749.36	1.58	-0.04
Muni./Oth.Pub.Local Debt	1094.8	-1.19	1096	2.36	0
Other	1684.36	-27.58	1711.94	3.63	-0.06
Other Assets	907.02	-38.01	945.03	1.95	-0.08
Physical: Comm	21.39	-0.16	21.55	0.05	0
Physical: Real Estate	694.21	-0.27	694.48	1.49	0
Reverse Repo	752.74	-42.49	795.23	1.62	-0.09
Sovereign Bonds	3701.82	-18.51	3720.33	7.97	-0.04
Structured/Securitized Products	1329.47	-54.03	1383.51	2.86	-0.12
Unlisted Equities	161.98	-0.52	162.5	0.35	0
Interest Rate Derivatives	45244.9	-1116.9	46361.79	97.37	-2.4
Foreign Exchange Derivatives	2087.6	-553.6	2641.2	4.49	-1.19
Equity Derivatives	607.93	-323.39	931.32	1.31	-0.7
Credit Derivatives	254.38	-208.01	462.39	0.55	-0.45
Commodity Derivatives	90.9	-15.22	106.12	0.2	-0.03
Other Derivatives	62.53	-75.21	137.74	0.13	-0.16

Open-Ended Fund Leverage

Tab.5: Open-Ended fund leverage broken down by jurisdiction for 2022^[55]

Asset Class	Number of Open-ended Funds	Aggregate NAV (USD Millions)	Gross Leverage (inc. IR and FX Derivatives)	Gross Leverage (excl. IR and FX Derivatives)	Synthetic Leverage
Luxembourg	13,124	704,705	1.35	1.11	0.29
US	11,517	26,182,198	2.72	1.02	1.73
Brazil	9,462	1,109,226	2.84	2.32	0.6
China	9,276	3,235,092	0.69	0.69	-
Ireland	5,505	2,823,850	1.83	1.22	0.76
Canada	5,393	2,436,052	1.19	0.96	0.26
France	4,575	717,007	1.22	1.18	0.15
Germany	4,441	2,165,252	1.32	1.04	0.35
Spain	2,632	343,545	1.23	1.02	0.31
Italy	35	7,709	0.81	0.55	-
UK	934	553,021	1.32	1.04	0.35
Belgium	665	209,650	1.06	1.02	0.08
Netherlands	659	539,464	1.32	1.05	0.31
Hong Kong	626	153,771	1.09	1.01	0.14
Morocco	559	47,943	0.82	0.82	-
Switzerland	518	1,006,610	1.19	0.9	0.3
Chile	508	54,554	-	-	-
Portugal	179	22,586	1.05	0.98	0.08
Colombia	154	17,161	1.42	1.41	-
Jersey	95	54,874	-	-	-
Romania	89	3,219	0.85	0.85	-
Mexico	49	11,877	1.09	0.95	0.14

[55] Italy's and Luxembourg's aggregate NAV and leverage metrics are calculated by removing the UCITS funds which do not have more granular data.

Closed-Ended Fund Exposures

Tab.6: Closed-ended fund exposures broken down by asset class (USD Billions) for 2022.

Asset Class	Long	Short	GNE	Long (% NAV)	Short (% NAV)
CIU	550.87	-0.25	551.13	17.06	-0.01
Cash	89.19	-15.4	104.59	2.76	-0.48
Convertible Bonds	25.2	-0.17	25.37	0.78	-0.01
Corporate Bonds	610.23	-0.79	611.02	18.9	-0.02
Listed Equities	172.41	-0.13	172.54	5.34	0
Loans	234.09	-12.86	246.95	7.25	-0.4
Muni./Oth.Pub.Local Debt	0.24	0	0.24	0.01	0
Other	7.95	-0.77	8.72	0.25	-0.02
Other Assets	172.19	-2.63	174.82	5.33	-0.08
Physical: Comm	18.8	-0.04	18.84	0.58	0
Physical: Real Estate	411.04	-0.17	411.21	12.73	-0.01
Reverse Repo	11.66	0	11.66	0.36	0
Sovereign Bonds	336.12	-0.04	336.16	10.41	0
Structured/Securitized Products	41.91	-0.01	41.92	1.3	0
Unlisted Equities	797.28	-0.72	797.99	24.69	-0.02
Foreign Exchange Derivatives	112.04	-9.32	121.37	3.47	-0.29
Equity Derivatives	25.07	-1.29	26.36	0.78	-0.04
Interest Rate Derivatives	21.02	-4.64	25.66	0.65	-0.14
Other Derivatives	4.52	-1.31	5.83	0.14	-0.04
Commodity Derivatives	0.39	-0.04	0.42	0.01	0
Credit Derivatives	0.2	-0.55	0.75	0.01	-0.02

Closed-Ended Fund Leverage

Tab.7: Closed-ended fund leverage broken down by jurisdiction for 2022.

Asset Class	Number of Closed-ended Funds	Aggregate NAV (USD Millions)	Gross Leverage (inc. IR and FX Derivatives)	Gross Leverage (excl. IR and FX Derivatives)	Synthetic Leverage
Brazil	9,560	319,185	0.56	0.51	0.36
Luxembourg	4,972	1,078,192	1.18	1.1	0.09
France	3,056	282,882	0.93	0.93	-
China	1,300	502,545	1.83	1.83	-
Italy	1,229	132,395	0.96	0.91	-
UK	1,176	334,507	1.11	1.08	0.04
Chile	756	34,598	-	-	-
Germany	621	44,098	1.19	1.18	0.01
Ireland	537	131,277	1.09	1.06	0.03
Netherlands	478	154,737	1.05	1.04	0.01
Portugal	458	16,567	1.3	1.3	-
Canada	354	221,881	0.62	0.52	0.09
Jersey	315	281,517	-	-	-
Colombia	175	8,474	1.2	1.2	-
Morocco	79	7,044	-	-	-
Belgium	44	2,151	1.22	1.2	0.02
Romania	29	333	0.92	0.92	-