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FIRST RESULTS FROM AIFM REPORTING

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SUMMARY

Directive 2011/61/EU on Alternative Investment Fund Managers (AIFM) is the European response to the 2008 financial crisis and to the G20's 2009 commitment to monitor alternative funds. AIFM reporting, the focal point for risk monitoring and supervision was introduced in 2013. It requires that asset management companies produce a risk report that provides information on the AIF's exposures and counterparties, as well as on each fund's level of risk (liquidity, leverage, etc.). It also includes descriptive data on each AIF's strategy and investors.

This study is the first to offer insight into the AIF market in France, based on data reported by French asset managers, on all the AIFs that they manage (with a French or foreign domicile). Its primary objective is to contribute to the risk assessment work of the AMF and of other French, European and international institutions. It is a first step towards tracking management trends at the macroeconomic level. The scope of the data gathered and the improvement in their quality prompt the need to stress that this work can still be further improved and expanded on in the future. Future editions that include additional risk indicators, better data coverage and possible revisions to data and methods should therefore be anticipated.

The study presents the characteristics of AIFs that report in France, consisting of 5,168 funds at end-2017 for a net asset value of €688 billion and exposure of €915 billion. Very few are hedge funds (0.6% of total net asset value), and most have characteristics similar to those of less risky funds: 59% of total net asset value is made up of equity, bond and diversified funds.

The main risk indicators (liquidity, leverage, type of investor) appear to be consistent, on a fund-by-fund basis, with the strategies employed. For all AIFs on average, and under normal market conditions, commitments on the liability side appear to be consistently shorter than the asset liquidation periods, as reported by fund managers. Leverage remains low for private equity funds and funds of funds (100% of net asset value on average); it is slightly higher for real estate funds (150% to 200% on average); and it is substantial for hedge funds (600% on average). In addition, an analysis was conducted on a fund-by-fund basis to verify that there was no excessive risk taking. Lastly, on average, 70% of AIFs are held by professional investors, primarily insurance corporations and financial institutions.

FIRST RESULTS FROM AIFM REPORTING

1. PRESENTATION OF THE REPORTING AND TOPICS COVERED

Directive 2011/61/EU on Alternative Investment Fund Managers (AIFM), published on 8 June 2011, is a pan-European regulatory regime applicable to all alternative investment fund (AIF) managers. It provides a harmonised supervisory framework for all fund managers in the European Union and aims to enhance their transparency, protect investments, strengthen the market's confidence, and monitor and limit the systemic risks likely to trigger another financial crisis. It is the European response to the 2008 financial crisis and to the G20's 2009 commitment to monitor alternative funds.

At the end of 2017, French AIFs represented 47% of French collective investment assets; the other funds are Undertakings for Collective Investment in Transferable Securities (UCITS), governed by the UCITS Directive¹. A detailed presentation of the fund managers and funds concerned, as well as the requirements of the Directive that do not relate to reporting, is provided in the Appendix.

The AIFM Directive regulates the activities of all investment fund managers not subject to the UCITS IV standard, including private equity funds, real estate funds and alternative management funds (funds of funds and hedge funds). The typologies concerned are the funds offered to non-professional investors (52% of French AIFs' total assets), to professional investors (31%) and employee savings funds (17%). To achieve greater transparency, the Directive imposes a set of requirements on fund managers, one of which is to submit reportings to the regulator.

Two types of reportings are transmitted: AIFM (fund manager) reportings containing information about the total value of the assets under management and the principal markets and financial instruments traded at the management company level; and AIF (fund) reportings on all funds under management consisting of information about the composition of the assets, the principal exposures, the leverage used and the risk measures calculated.

In France, the management companies affected by the Directive are those that are domiciled in France and that manage one or more AIFs, regardless of whether these AIFs are French, EU, or third-country AIFs. The following table summarises the regulatory reporting requirements imposed on management companies. The frequency of the reporting depends on the value of net assets under management.

Table 1: Regulatory reporting requirements

Type of reporting	Net asset value <= thresholds (€100M and €500M)	Net asset value > thresholds but <= €1bn	Net asset value > €1bn
AIFM basic reporting (Articles 3(3)(d) and 24(1) of Directive 2011/61/EU)	Annually	Half-yearly	Quarterly
AIF "lighter" reporting (Articles 3(3)(d) and 24(1) of Directive 2011/61/EU)	Annually (for each AIF managed)	Half-yearly (for each AIF managed)	Quarterly (for each AIF managed)
AIF "full" reporting (Article 24(2) of Directive 2011/61/EU)	Annually only if opt-in	Half-yearly (for each AIF managed)	Quarterly (for each AIF managed)
Leverage (Article 24(4) of Directive 2011/61/EU)	Annually only if opt-in and leverage >3	Half-yearly if leverage >3	Quarterly if leverage >3
Workforce of French AMCs that transmitted at least one report at end-2017	280	68	96

Source: AMF

Note: At end-2017, 96 French fund managers managing more than €1 billion in assets transmitted quarterly AIFM reports, as well as quarterly "full" reports for all their funds. Additional information was required for those that employed leverage on a substantial basis, such as a breakdown of leverage based on whether it arises from borrowings of cash or securities or from derivatives.

To offset these new requirements, the AIFM Directive allows the cross-border marketing of funds to professional investors. With the entry into force of the AIFM Directive, authorised asset management companies fully subject to the Directive benefit from a *marketing* passport that allows them to market the AIFs that they manage to professional investors (as defined in the European Markets in Financial Instruments Directive) on a pan-European basis. Asset management companies are also given a *management* passport that

¹ Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009.

allows them to conduct business directly in another Member State (freedom to provide services) or through a branch (freedom of establishment).

A detailed analysis of the Directive's requirements and its impacts on management companies and AIFs is presented in the Appendix. The following table provides an overview of the main topics covered by both types of regulatory reporting (fund manager and fund). Reporting at the AIF level, for which detailed statistics are presented below, consists of a total of 302 variables, of which 60 are mandatory, 126 are optional (including 13 that can be made mandatory by the national supervisory authority) and 116 are contingent on the responses provided².

Table 2: AIFMD reporting topics

Reporting	Information
AIFM ESMA Guidelines 2013/1339 Annexes II-XI	<ul style="list-style-type: none"> -Identification of the fund manager: name, national code, LEI & BIC codes -Ranking of the 5 principal markets - MIC (regulated), OTC or other "XXX", aggregated value of the assets -Ranking of the 5 principal financial instruments by sub-asset types, aggregated value of the assets -Total value of assets under management, currency, exchange rate
AIF ESMA Guidelines 2013/1339 Annexes II-XII	<ul style="list-style-type: none"> -Identification of the AIF: legal name of the AIF, ISIN code, LEI & ECB codes (optional), domicile, structure of the AIF -Total value of exposure, of assets under management, currency, exchange rate -Breakdown of strategies: hedge fund (long/short, market neutral, etc.), private equity (venture capital, growth capital, etc.), real estate (residential, commercial, etc.) fund of funds (fund of hedge funds, etc.) and other (equities, fixed income, etc.) or a mix of several strategies -5 principal instruments on the reporting date: sub-asset type, name of the financial instrument, ISIN code, value, long/short position -Geographical breakdown: Africa, Asia and Pacific, EU, North America, etc. -10 principal exposures by sub-asset type and by position (long/short) -5 most important portfolio concentrations by sub-asset type and by position (long/short) -Breakdown of assets by investor group: percentage of units held by the 5 largest investors, by professional clients or retail investors -Measures of risk: Equity Delta, Vega, VaR -Counterparty risk: trading and clearing mechanisms, value of collateral (securities and cash), ranking of top counterparties in terms of exposure, exposure to CCPs -Liquidity: portfolio and investor liquidity (percentage per range of number of days), percentage of assets subject to side pockets, gates or dealing suspension, available founding (percentage per range of number of days) -Historical risk profile: monthly investment returns, monthly redemption/subscription volumes -Use of leverage: calculation under the gross and commitment methods

Source: AMF

2. ASSETS UNDER MANAGEMENT AND TYPOLOGY OF AIFS REPORTING IN FRANCE

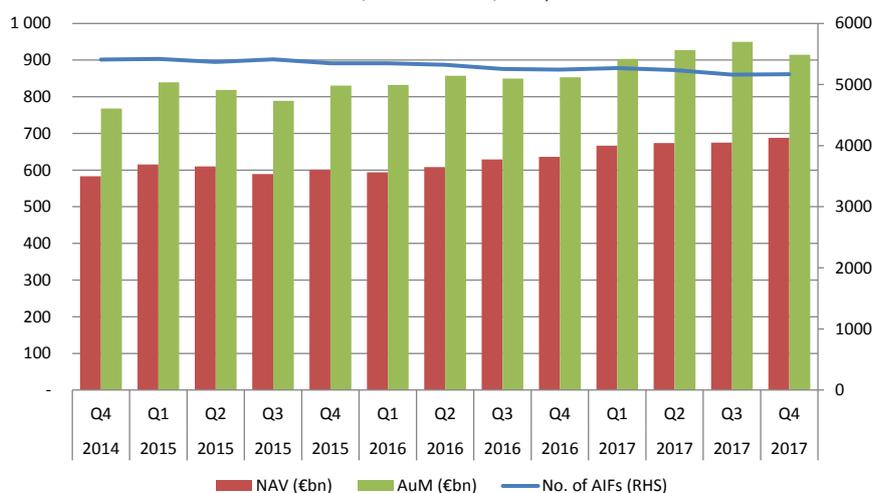
To monitor the largest AIFs on a recurring basis, the statistical analyses performed focused on the set of AIFs that report quarterly³: this group accounts for 90% of total AIF net asset value reported. These analyses are presented throughout this document as from the fourth quarter of 2014, as the reporting was not sufficient in prior quarters. Unless otherwise indicated, the results below are presented for the fourth quarter of 2017.

Since 2014, AIFs' net asset value has increased (€688 billion at end-2017, annual growth of 5.7%) as have their assets under management (€915 billion at end-2017, annual growth of 6%). The number of funds declined by 1.6% on an annual basis between end-2014 and end-2017, to stand at 5,168 AIFs at end-2017 (-240 since end-2014).

² For example, if the fund manager chooses to fill in its liquidity profile (optional variables consisting of seven sub-categories), it must fill in all the relevant variables.

³ AIFs that have nothing to report, generally because they were recently created (35 to 96 AIFs per quarter), are not included in this set.

Figure 1: Set of AIFs reporting on a quarterly basis
(NAV and assets under management in €bn,
LHS, and number, RHS)



Source: AMF

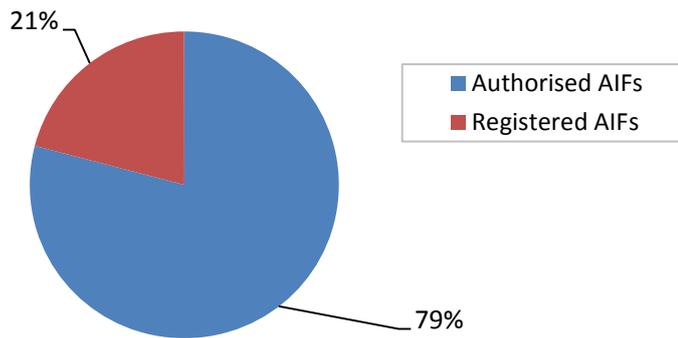
Two types of fund managers may be found among those that report to the French regulator: funds whose fund manager is authorised in France and funds that are authorised in the European Union but whose asset manager has a management passport (the AIF is then domiciled in France) or a marketing passport: in that case, they are “registered” with the French regulator and also have to file AIFM reportings based on their asset manager’s net asset value level (see 1.1). This registration procedure is also open, under certain conditions, to fund managers established in a non-EU country under the private placement regime⁴, but no AIFs were observed to have taken advantage of this regime in France. To summarise, the reporting scope currently consists only of French fund managers that report to the French regulator on all their AIFs domiciled in France, in another EU country or outside of the EU. Unlike authorised AIFs, which can be offered to retail or professional investors, the passport mechanisms only allow AIFs to be managed or to be marketed to professional investors.

In France, 81% of AIFs that report quarterly are authorised funds (79% in net asset value terms), a percentage that has remained fairly stable since 2015. Of these AIFs, 97.7% are domiciled in France (97.1% of total net asset value), a figure that has also remained stable over time. With the exception of Luxembourg (57 AIFs, €12.39 billion, or 1.8% of total net asset value) and Ireland (38 AIFs, €3.25 billion, or 0.5% of total net asset value), the other countries of domicile are relatively marginal (less than 0.2% of total net asset value). However, a shift was observed in 2017: while only five countries outside of France had been represented since 2014 (Luxembourg, Ireland, the United Kingdom, Guernsey and the Cayman Islands), in 2017 Italy, Germany and Belgium were for the first time counted among the countries of domicile and the net asset value of AIFs domiciled in Luxembourg, the United Kingdom, Guernsey and the Cayman Islands increased. This trend, which nevertheless concerns a marginal amount of assets under management, will have to be monitored over time.

No difference has been found between the two types of fund status in terms of size, as registered AIFs had an average net asset value of €144 million at end-2017 (median of €42 million), slightly higher than the average net asset value of €131 million (median of €30.5 million) for the significantly more numerous authorised funds.

⁴ Nevertheless, these fund managers can market their AIFs only under the national regimes, known as private placement regimes, that may be in place in each Member State. Unlike passport mechanisms, the national private placement regime allows non-EU fund managers to market their funds only within the territory of the Member State in question. The conditions imposed are compliance with certain minimum requirements set out in the AIFM Directive (they must comply with Articles 22 (annual report), 23 (disclosure to investors) and 24 (reporting obligations to competent authorities) for each AIF that they market) but each Member State is free to establish the conditions for such marketing.

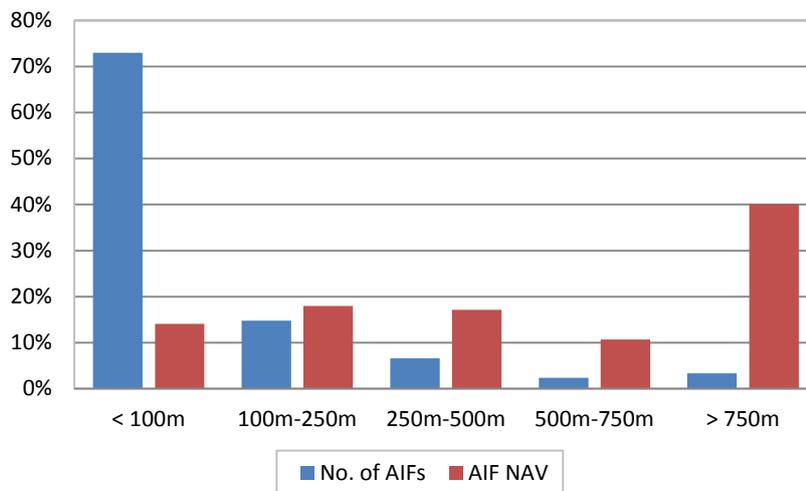
Figure 2: Net asset value of authorised and registered AIFs
(as % of total)



Source: AMF.

Assets are highly concentrated in a few large AIFs. Thus, 3.3% of AIFs that have a net asset value of more than €750 million represent 40% of the net asset value of all reporting AIFs. Conversely, 73% of AIFs in number terms have a net asset value of less than €100 million, in aggregate representing 14% of the total net asset value of reporting AIFs. In total, 94% of AIFs have a net asset value of less than €500 million and represent 49% of total net asset value, compared with 95% in Europe which represented 40% of total net asset value.

Figure 3: Breakdown of AIFs by size of net asset value
(as % of number and of total net asset value)



Source: AMF

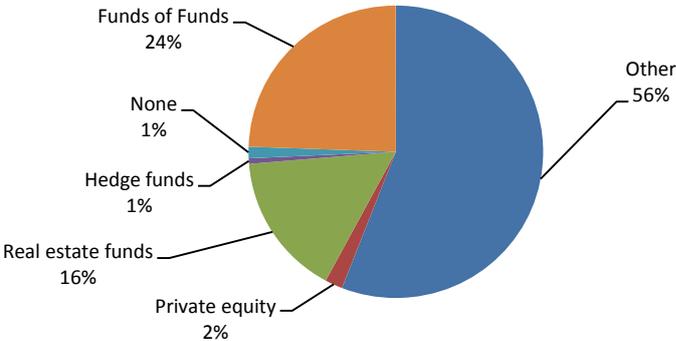
The vast majority of AIFs that report in France are in euros (98% in number terms, 99% in net asset value terms), with the dollar representing only 1.2% of AIFs in number terms and 0.7% in total net asset value terms. The weight of the euro has, moreover, increased slightly since 2014 (up 1.3% as a percentage of total net asset value), while other currencies (dollar, Swiss franc, yen) have lost ground. AIFs in pound sterling remain marginal (0.12% in number terms, 0.13% in net asset value terms), although they have increased slightly since 2014.

AIFM reporting also enables fund managers to present their investment strategy, through a variable that presents their primary strategy, as well as several others enabling them to weight other sub-categories in their net asset value. This classification is critical to establishing indicators to monitor funds at aggregated levels.

Nevertheless, a majority of AIFs indicates that the primary strategies proposed by the reporting do not reflect their primary strategy, with 51% (56% of total net asset value), reporting that they use “other” strategies than those presented, i.e. hedge funds, funds of funds, real estate funds, or private equity funds, which makes it impossible to properly classify the funds. The other most frequently used primary strategies are funds of funds

(35% in number terms, 24% in total net asset value terms), real estate funds (8% in number terms, 16% in net asset value terms) and private equity (4% in number terms, 2% in total net asset value terms). The final two categories represent less than 1% of total net asset value: hedge funds (0.8% in number terms, 0.6% in net asset value terms) and funds with no primary strategy.

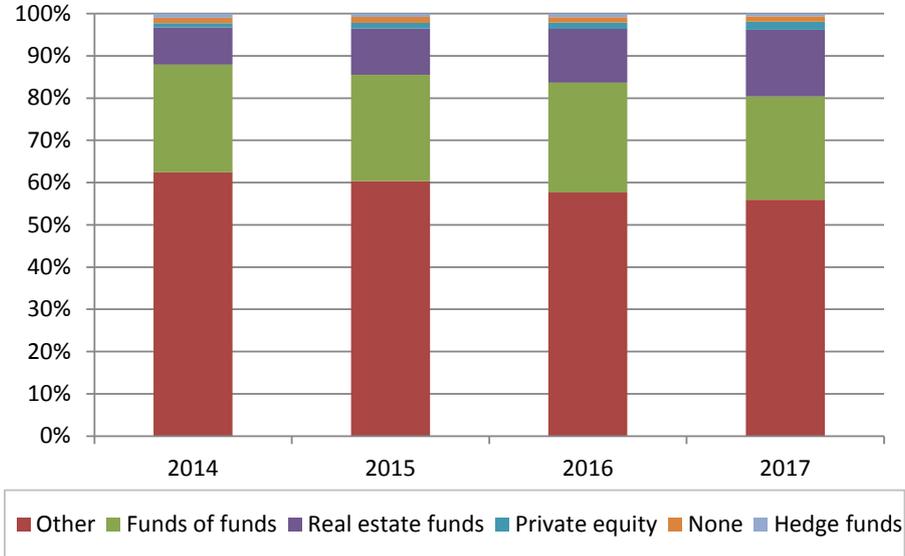
Figure 4: Breakdown of types of AIFs
(as % of total net asset value)



Source: AMF

An historical analysis of the primary strategies shows a decrease in the “other” category (total net asset value down 6% since 2014) and an increase in the net asset value of real estate funds (up 5%) and private equity funds (up 0.9%).

Figure 5: Change in the predominant types of AIFs,
(as % of total net asset value)



Source: AMF

An analysis of the 35 sub-categories into which fund managers can split their net asset value helps provides a more accurate view of the characteristics of the AIFs. Thus, the “other” category, which represents €385 billion at end-2017, breaks down into “other” sub-strategies for 49% of their net asset value, as well as fixed income funds (31% of their net asset value), equity funds (20%) and, to a lesser extent, infrastructure funds (1%). Similarly, the breakdown of AIFs stating that they do not have a primary strategy (€9 billion at end-2017) is 64% fixed income funds, 18% other funds of funds and 16% equity funds.

Within real estate funds, which represent €109 billion at end-2017, commercial real estate strategies accounted for 70% of their net asset value, other real estate strategies for 15% of their net asset value, and residential real estate strategies for 13%.

Figure 6: Breakdown of the “Other” strategy by type of sub-strategy
(as % of the strategy's net asset value)

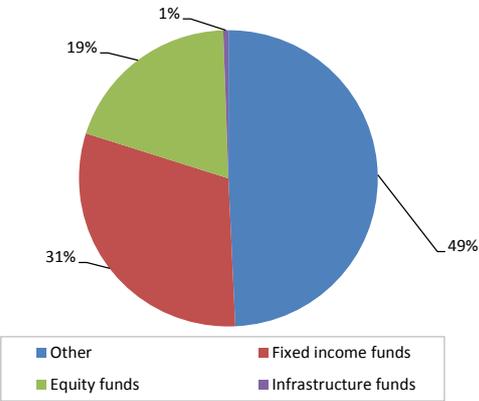
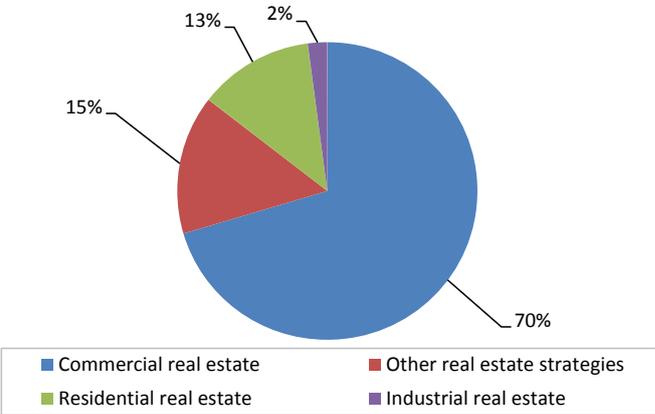


Figure 7: Breakdown of the “real estate” strategy by type of sub-strategy
(as % of the strategy's net asset value)



Source: AMF

The vast majority of funds of funds (€168 billion at end-2017) consider themselves to be “other funds of funds” (94% of their net asset value), and do not appear to have identified their investment strategies among those proposed in the reporting. Among private equity funds (€13 billion at end-2017), growth capital strategies⁵ account for 58% of their net asset value, mezzanine strategies⁶ for 24% and, to a lesser extent, other strategies for 12% and venture capital strategies for 8% of their net asset value.

Lastly, hedge funds (€5 billion at end-2017) use 13 sub-strategies, some of which are negligible: consequently, sub-strategies are presented here only if they represent more than 5% of these funds’ net asset value. Some of the hedge funds use an equity long bias strategy⁷ (45% of net asset value), an event driven strategy⁸ (11%), or a futures strategy (7%). The hedge funds category is the one in which the sub-categories fluctuated the most over time. For example, the net asset value of hedge funds with an “equity: long/short” strategy decreased from €788 million at end-2014 to €78 million at end-2017. In contrast, the net asset value of equity hedge funds with a long bias increased from €82 million to €1.88 billion in the same period.

⁵ The growth capital strategy involves financing companies that are reasonably mature, large and profitable and able to maintain a strong growth outlook. The venture capital strategy relies on acquiring stakes in unlisted companies, often in the start-up phase, that need capital to launch their activities.

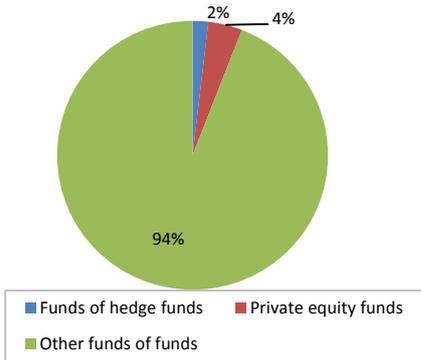
⁶ This strategy involves the use of mezzanine debt, the repayment of which is subordinate to senior debt and on which returns are therefore higher. Using this type of debt can increase leverage when acquisitions are made through borrowing.

⁷ The long/short equity strategy involves taking long positions on securities viewed as undervalued and short positions on overvalued securities; it is therefore possible to play market anomalies to generate a gain in both bearish and bullish trends. Depending on the proportion of long positions to short positions, the strategy may be said to be biased (e.g. it has a long bias if long exposure is greater than short exposure).

⁸ Event driven management aims to take advantage of price anomalies arising after a specific event, such as a bankruptcy, merger, acquisition, restructuring, etc.

Figure 8: Breakdown of the “fund of funds” strategy by type of sub-strategy

(as % of the strategy's net asset value)



Source: AMF

Figure 9: Breakdown of the “private equity” strategy by type of sub-strategy

(as % of the strategy's net asset value)

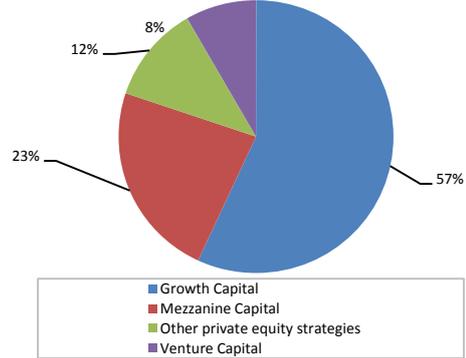
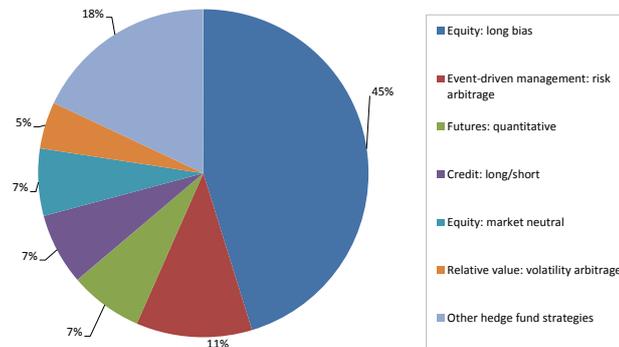


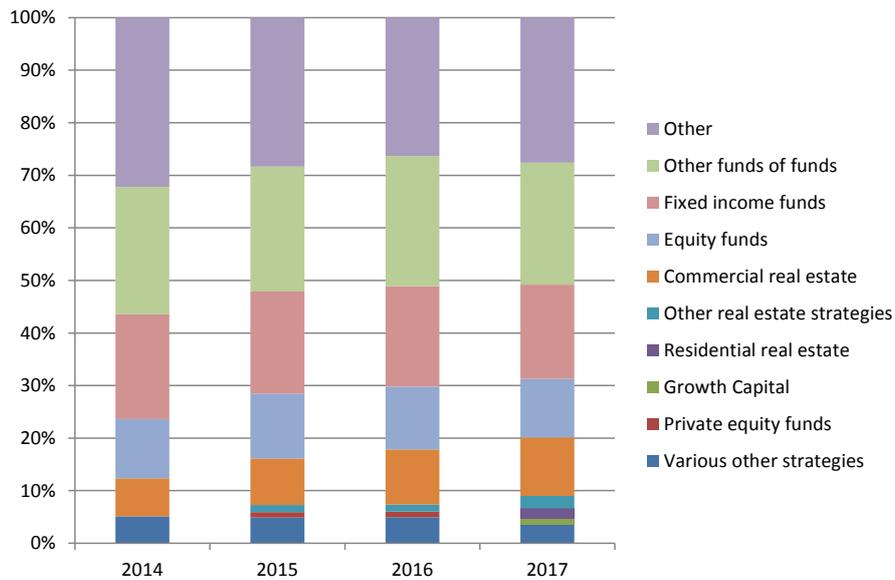
Figure 10: Breakdown of the “hedge fund” strategy by type of sub-strategy
(as % of the strategy's net asset value)



Source: AMF

In total, when the analysis is limited solely to sub-categories of strategies weighted by net asset value, five of those represent 93% of AIFs’ net asset value since 2014. Fund managers continue to fail to categorise a significant percentage of their assets, with the “other - other” sub-category representing 28% of total net asset value at end-2017, followed by the sub-strategies “other fund of funds” (23%), fixed income (18%), equity (11%) and commercial real estate (11%) at end-2017. Only the residential real estate (2%) and growth capital sub-strategies represent more than 1% of AIFs’ net asset value at end-2017.

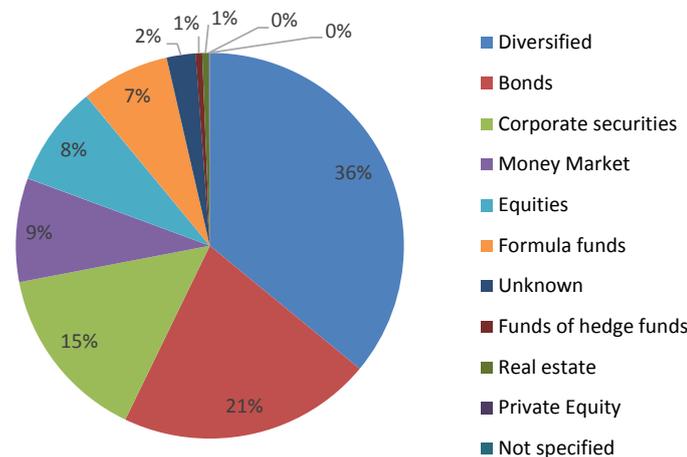
Figure 11: Change in types of AIFs by sub-strategy
(as % of the sub-strategy's net asset value)



Source: AMF. The “Various other strategies” sub-strategy comprises all the sub-categories of strategies whose share in the net asset value of AIFs is less than 1%.

To better understand the funds reporting an “other - other” strategy (28% of total net asset value at end-2017, or €190 billion), the net asset value in question is broken down by asset class based on the AMF’s internal database for investment funds (BIO). Net asset value is split mainly into diversified funds (36%), bond funds (21%) and corporate security funds (15%) and, to a lesser extent, money-market and equity funds.

Figure 12: Breakdown of the “other – other” strategy by asset class
(as % of the strategy's net asset value)



Source: AMF

There were 5,168 AIFs that reported in France at end-2017, for a total net asset value of €688 billion. The latter was fairly concentrated, with 3% of AIFs representing 40% of total net asset value.

An analysis of the typology of AIFs that report in France shows that many have indicated that the primary strategies presented in the AIFM reporting do not reflect their primary strategy: for 28% of the total net asset value of AIFs that report in France, an “other” strategy and sub-strategy is used. Nevertheless, most of the AIFs analysed resemble more traditional funds: equity, bond and diversified funds represent 59% of the net

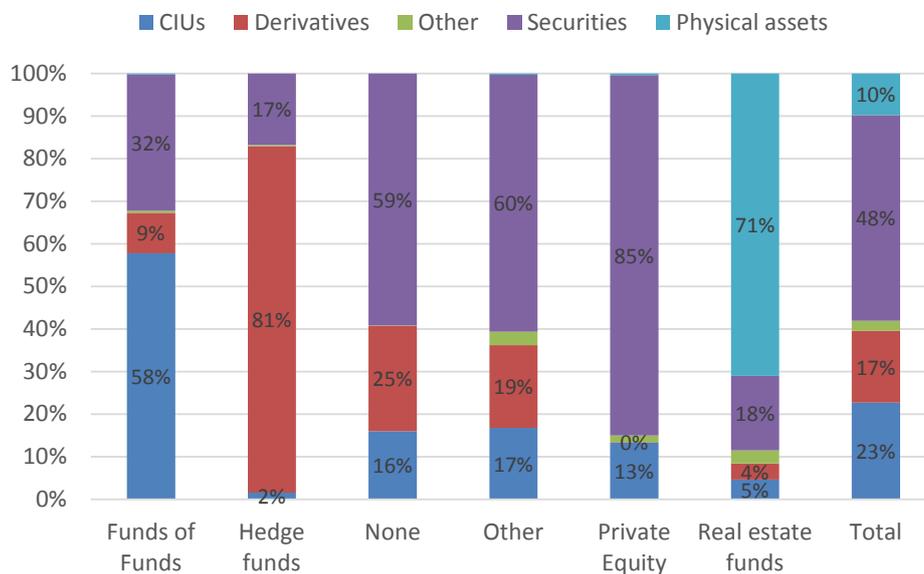
asset value of reporting AIFs.

Ultimately, there appear to be few hedge funds among the funds that report in France (0.6% of AIFs' total net asset value).

3. EXPOSURES OF AIFS REPORTING IN FRANCE

Under Article 24(2) of the AIFM Directive, fund managers are required to provide information on the main categories of assets in which their AIFs invest and on their AIFs' level of individual exposure. The reporting proposes five classes to which the AIF may be exposed to for investment or hedging purposes: securities, derivatives, collective investment undertakings (CIUs), physical (real/tangible) assets, and other asset classes; these are then broken down into 72 sub-classes to provide additional clarity on the nature of these exposures.

Figure 13: Breakdown of exposures by primary investment strategy
(as % of total exposure to each strategy)

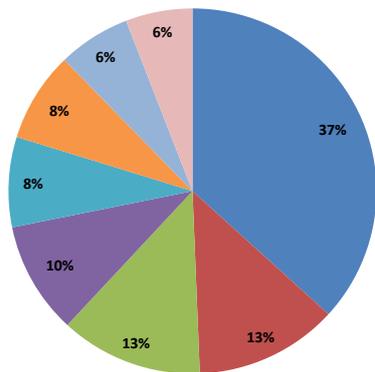


Source: AMF

Not surprisingly, funds of funds have significant exposure to CIUs (58% of their exposure), real estate funds to physical assets (71%), and private equity funds to securities (85%). Most of the exposure to derivatives concerns hedge funds (81%), which appear to be increasing their exposure (42% at end-2014 compared with 76% at end-2015 and 2016).

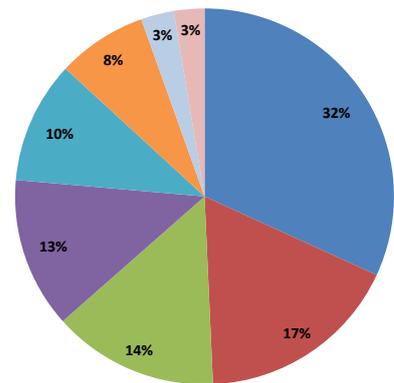
In contrast, private equity funds are reducing their holdings of securities (91% in 2015 and 88% in 2016) in favour of CIUs (13% in 2017 compared with 8% in 2015).

Figure 14: Breakdown of “securities” class exposure by exposure sub-class (as % of the class's exposure)



- Other listed equities
- EU bonds with a 1+ year term to maturity
- Corporate bonds not issued by financial institutions (investment grade)
- Unlisted equities
- Listed equities issued by financial institutions
- Corporate bonds issued by financial institutions (investment grade)
- Other deposits
- Other cash and cash equivalents (excluding government securities)

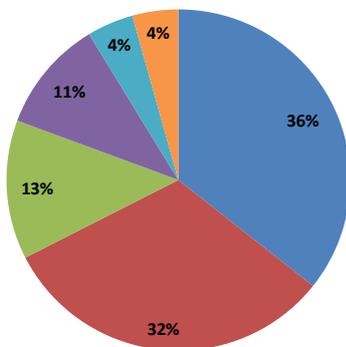
Figure 15: Breakdown of the “derivatives” class exposure by exposure sub-class (as % of the class's exposure)



- Interest rate derivatives
- Fixed income derivatives
- Foreign exchange (hedging)
- Other derivatives
- Foreign exchange (investment)
- Other equity derivatives
- Equity derivatives related to financial institutions
- Index CDS

Source: AMF

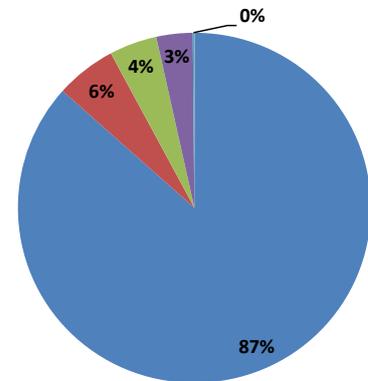
Figure 16: Breakdown of the “CIU” class exposure by exposure sub-class (as % of the class's exposure)



- CIUs not managed by the AIFM
- CIUs managed by the AIFM
- Money-market CIUs (managed by the AIFM)
- Money-market CIUs (not managed by the AIFM)
- CIUs managed by the AIFM - ETFs
- CIUs not managed by the AIFM - ETFs

Source: AMF

Figure 17: Breakdown of the “physical assets” class exposure by exposure sub-class (as % of the class's exposure)



- Commercial real estate
- Physical assets: Other
- Physical assets: Commodities
- Other real estate
- Residential real estate
- Physical assets: Timber

AIFs mainly use 15 instruments within the exposure sub-classes, across all investment strategies, covering 75% of total exposure at end-2017.

Within the securities class, the main exposure identified is listed equities issued by non-financial institutions (other listed equities; 37%), while equities issued by financial institutions and unlisted equities are used to a lesser extent (8% and 10%, respectively). The share corresponding to bonds stood at 34% and breaks down into EU bonds (13%), bonds issued by non-financial institutions and bonds issued by financial institutions (13% and 8%, respectively). Use of certificates of deposit is relatively modest (7%). Lastly, exposure to the more atypical typologies of securities is very limited: 0.84% to loans, 0.53% to asset-backed securities/structured products and 0.43% to non-investment grade convertible bonds.

At the CIU class level, exposure is driven mainly by CIUs not managed by the management company and CIUs managed by the management company (36% and 32%, respectively) but money-market CIUs (24%) and ETF CIUs (8%) are also used to a lesser extent. With regard to physical assets, a very high concentration is observed in commercial real estate (87%) while exposure to residential real estate represents only 3%.

Lastly, within the derivatives class, interest rate derivatives, foreign exchange, and fixed income derivatives appear to be the most popular among fund managers, representing 32%, 24% and 17%, respectively, at end-December 2017. CDS cover 7% of the total exposure of this asset class, of which 3% is driven by index CDS. Commodities account for only 0.73% of the exposure, of which 0.34% in precious metals (excluding gold).

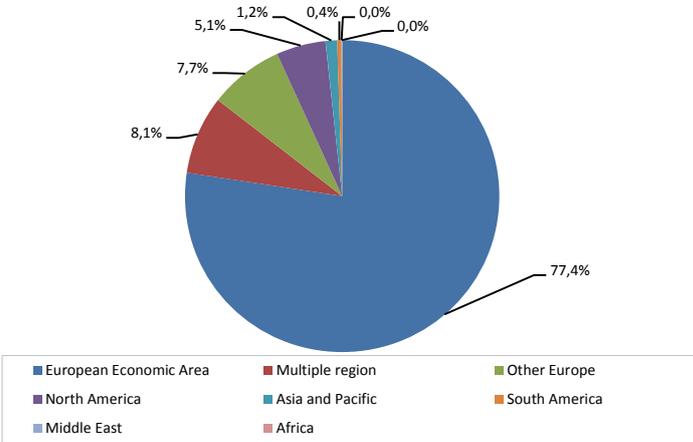
Exposure to derivatives can fluctuate quite significantly from one quarter to the next, depending on the investment strategies used by certain funds with substantial leverage (mainly hedge funds). For example, the behaviour of four funds (Box 1) caused fairly significant variations in the class’s exposure at the aggregate level during 2017. The levels of exposure observed are estimated to be consistent with the strategies used.

Box 1: Notable examples

- One fund whose exposure to *fixed income* derivatives decreased from €52 billion at end-June 2017 to €3 billion at end-September 2017 (it had adopted a systematic three-driver strategy: long-term rates/short-term rates/foreign exchange).
- Three funds that reported exposure to *interest rate derivatives* of close to €26 billion at end-June 2017 before being closed in end-September 2017.

In terms of geographic exposure, AIFs are mostly exposed to the European Economic Area (EEA) and to the rest of Europe (85% of weighted net asset value at end-2017), and have few investments in other regions except for North America (5%)⁹. It is also apparent that investment in Africa and the Middle East is negligible (0.03% and 0.04% of their net asset value, respectively). These proportions have changed only very slightly over time.

Figure 18: Geographic breakdown of the weighted geographic exposure of AIFs (as % of net asset value)



Source: AMF

Differences are observed based on strategy: private equity funds and real estate funds are 98% invested in the European Economic Area at end-2017, compared with funds of funds at 62%; for the latter, multiple region investments simultaneously accounted for 22% of their weighted net asset value. Lastly, hedge funds are more exposed on average to the EEA (84% of their weighted net asset value) and to North America (18%), but underexposed to regional areas (-6% of their weighted net asset value).

⁹ Fund managers are also asked to describe their geographic exposures as a percentage of their assets under management (AuM): only small changes versus their exposures as a percentage of their net asset value were observed, with a lower percentage of exposure to the EEA and to the rest of Europe (69% and 9%, respectively, of AuM at end-2017) and a higher exposure to multiple regions (13% of AuM at end-2017).

The exposures of AIFs reporting in France appear to be consistent with their strategies: real estate funds are 71% exposed to physical assets, private equity funds 85% exposed to securities, funds of funds 58% exposed to collective investment undertakings, and “other” strategy funds 60% exposed to securities. Exposure to derivatives consists mainly of interest rate, foreign exchange and fixed income derivatives. For all funds, exposure to atypical equity products, such as structured products and convertible bonds, is very low. Lastly, more than 85% of their net asset value is exposed to Europe.

4. LIQUIDITY RISK

One of the primary aims of AIFM reporting is to assess funds’ exposure to liquidity risk. In that respect, it requires that fund managers assess the assets in their funds based on the time required for their liquidation, as well as investors’ presumed redemption behaviour, in order to assess their ability to withstand shocks by selling liquid assets. As these variables are optional, they were not completed by all fund managers. Results are available, however, for 85% of the number of quarterly reports for the period, but with a higher response rate since 2016 (3% left blank in number terms for 2017, 4% as a percentage of total net asset value), which would appear to be sufficient to examine fund managers’ liquidity assessments.

Figure 19: Structure by term of the portfolio's assets and liabilities, by strategy
(estimate as cumulative % of net asset value)

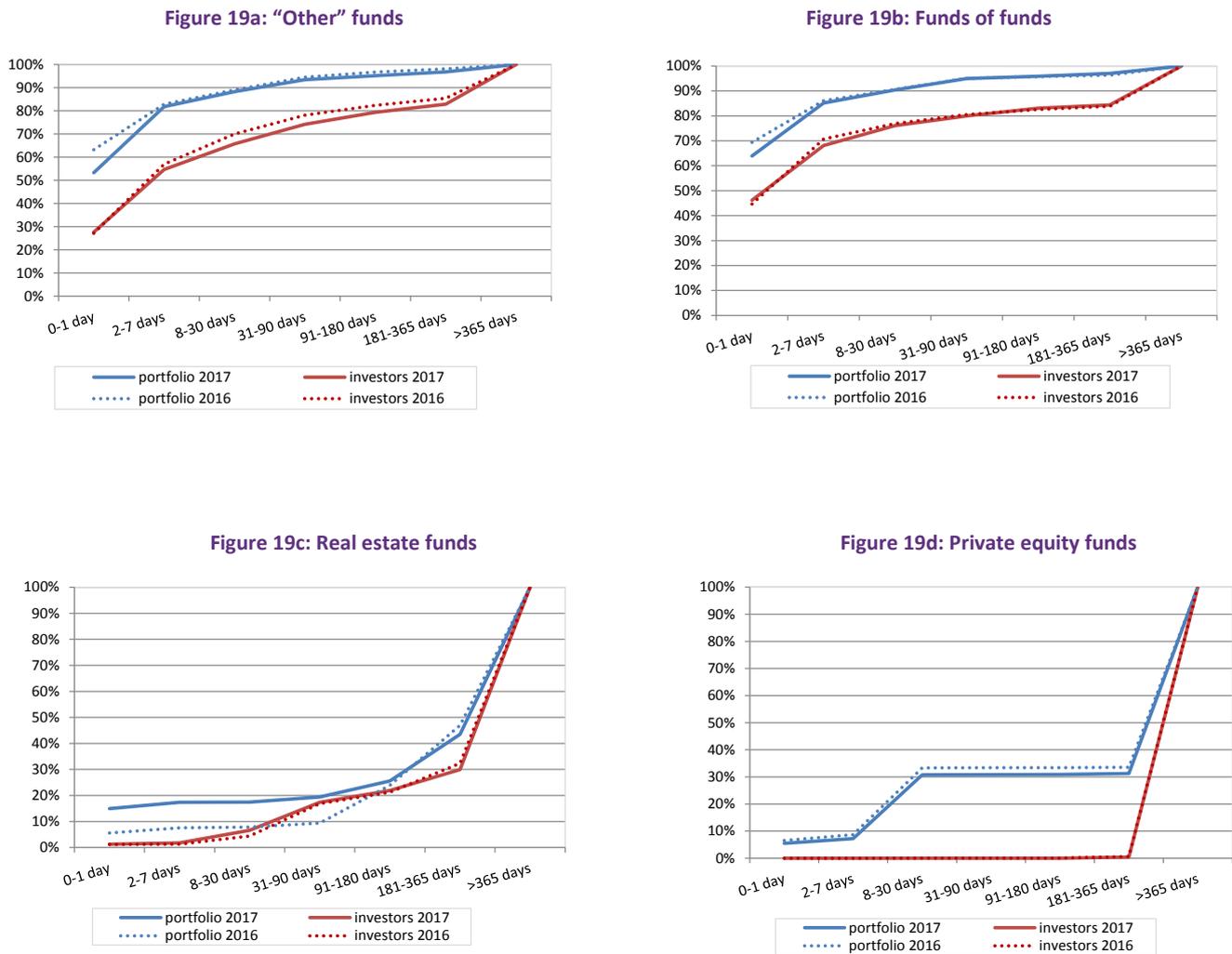
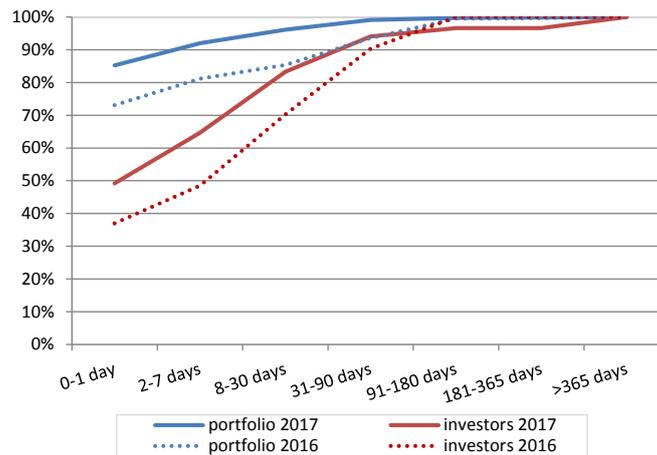


Figure 19e: Hedge funds



Source: AMF

On the asset side, depending on the strategy, there are categories of liquid funds, such as hedge funds, where 85% of assets are deemed by fund managers as capable of being liquidated within one day, and more illiquid funds, such as private equity and real estate funds, where the proportion of assets that can be liquidated within one day is only 5% and 15%, respectively. This structure on the asset side must be compared with the structure on the liability side, and with fund managers’ assessment of their ability to meet investors’ redemption requests, depending on the exit restrictions they may have put in place.

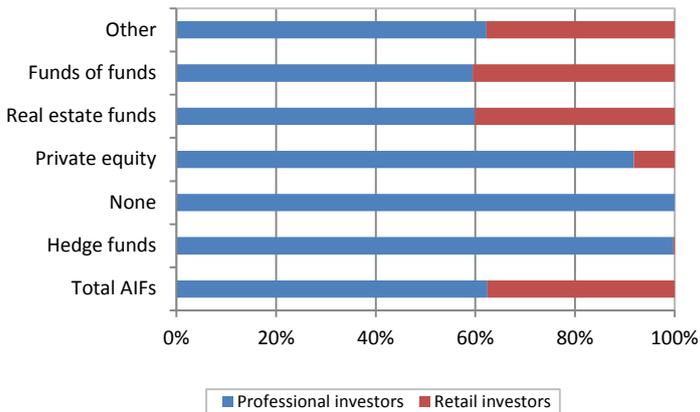
At the fund strategy level, commitments would appear here to be consistently (across all maturities, for all categories) shorter than the asset liquidation periods, demonstrating an overall ability to meet investor redemptions. Nevertheless, this average observation applies only under normal market conditions and doesn't apply to the individual liquidity conditions of the funds under review. Furthermore, it appears that some fund managers take into account in this horizon the time required for settlement, while others do not. Although it represents only an average, since each fund manager models in accordance with its own liquidation criteria, the structure of the liabilities – mainly the commitments to meet redemptions in the short term – seems to be broadly consistent with the structure of the funds’ assets. For example, the proportion of holders able to redeem their units within one day for “other” funds is 28%, while it is virtually zero for real estate funds and private equity funds. In both cases, the fund manager's assessment is that the AIF has, on average, a significant surplus of liquid assets to meet the redemptions.

To supplement the fund managers’ liquidity analysis, they are also asked to report on their ability to identify their clients on the liability side by means of several mandatory variables. This shows, in particular, that retail investors generally represent a minority of those that hold alternative funds (38% as an asset-weighted average at end-2017). This percentage has held fairly steady at around a quarterly average of 37% since end-2014.

There were some differences depending on the funds’ strategies: while hedge funds were 100% held by professionals, funds whose primary strategy is “other” were 38% held by retail investors and funds of funds were at 41% at end-2017. To a lesser extent, private equity funds were 8% held by retail investors at end-2017, a percentage that has declined (quarterly average of 11% since 2014). Lastly, at 40%, the percentage of retail investors holding real estate funds nevertheless appears significant, although it did decline over the period (quarterly average of 43% since 2014).

Figure 20: Breakdown of AIF client base

(as % of the weighted net asset value of each investment strategy)



Source: AMF

A more detailed classification of holders, as assessed by fund managers, is also requested (Figure 21). The differences compared with the previous figure arise from (i) fund managers’ limited knowledge of their liabilities, in a context where the reporting categories do not always correspond to the commercial information available to them, and (ii) the possibility of selling to retail clients through account-keepers (absence of a look-through approach).

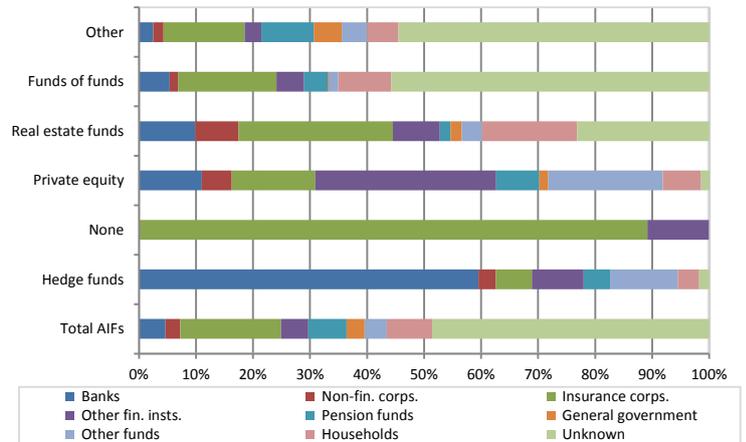
This is confirmed by the large share of “unknown” investors (49% on average for all AIFs at end-2017 but a median of 0%¹⁰, and 55% on average for “other” funds and funds of funds, 23% for real estate funds). The distribution of the proportion of unknown investors by strategy shows that it is mainly “other” funds (median of 100%) and, to a lesser extent, funds of funds (last quartile of 100%) that do not know their investors and are skewing this average.

Institutional investors make up the largest category of unitholders of French alternative funds, chief among them insurance corporations, which hold 18% of AIFs at end-2017 and 14%, 17% and 27%, respectively, of the net asset value of the “other” fund, fund of fund, and real estate fund categories. Banks and other financial institutions account for only a limited share of unitholders, i.e. 9% for all AIFs, but with wide variations depending on strategy: 5% for “other” funds but 18% for real estate funds, 43% for private equity funds and 69% for hedge funds. Similarly, pension funds represent only 2% of real estate fund holders, but 4% of funds of funds and 8% of private equity funds. Lastly, households represent only a small share of direct holders (5% of investors in “other” funds, 4% of hedge funds, 7% of private equity funds and 9% of funds of funds), except for real estate funds, in which they own 17% of units.

Units held by the top five investors are also critical to understanding investors’ exit behaviour. For all AIFs reporting in France, 70% of their net asset value is held by the top five investors at end-2017 (down over the period, 74% at end-2014), with notable differences depending on strategy: 54% for real estate funds, 77% for private equity funds and 87% for hedge funds.

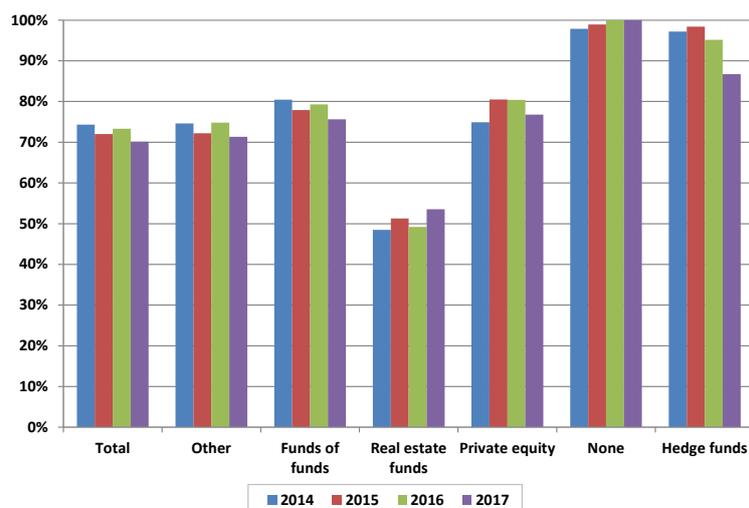
Figure 21: Detailed investor categories

(as % of the weighted net asset value of each investment strategy)



¹⁰ Most of the time, either the AIF reports all its investors in the nine sub-categories (in that case, the share of “unknown” investors is 0%), or the AIF states that all its investors are in the “unknown investor” sub-category, which skews the average.

Figure 22: Weighted percentage of units held by the top five investors
(as % of net asset value by strategy)



Source: AMF

These data help address two of the priorities recommended by the International Organization of Securities Commissions (IOSCO) in 2018¹¹ regarding portfolio managers' liquidity management: encourage verification of the consistency of the management of asset/liability mismatches (liquidity of the assets to meet redemptions) and enhance the transparency of the funds' liquidity profile among unitholders and the authorities. These recommendations also aim to encourage the accessibility of a wide range of liquidity management tools, based on the specific characteristics of the funds under management (strategies implemented, nature and structure of exposures on the asset and liability sides, etc.).

AIFM reporting also makes it possible to gather information about the different liquidity management tools that fund managers use, although these variables are optional and many responses are therefore left blank. These data will nevertheless allow the regulator to observe developments in the implementation of the new French legal framework that entered into force in early 2018¹², which clarifies, for many types of funds, the conditions for implementation or introduces: (i) notice periods for subscriptions and/or redemptions, (ii) redemptions in kind and (iii) the partial or full closure to subscriptions.

At end-2017, 40% of AIFs in number terms and 43% of the total net asset value of AIFs that report on a quarterly basis were open to redemptions (26% provided no response), a substantial increase over 32% at end-2014 (in number terms and as a percentage of total net asset value). Real estate funds¹³, funds of funds and, in particular, hedge funds implemented more of these tools, in keeping with their lower liquidity on the asset side noted above. The establishment of redemption notice periods gives fund managers the flexibility to execute orders on certain markets that might be less liquid (for example, the small-cap or high-yield bond markets) and therefore prevent portfolio distortion, in the interest of the fund's unitholders or shareholders. At end-2017, 15% of AIFs offered daily liquidity (27% of net asset value), 12% weekly liquidity, 2% bi-monthly liquidity, 3% monthly liquidity, and 3% quarterly liquidity.

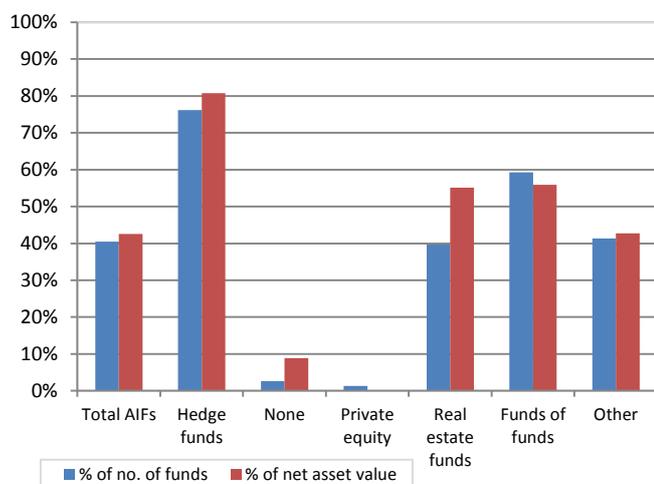
¹¹ IOSCO (2018), "Recommendations for liquidity risk management for collective investment schemes", February. The other two priorities aim to encourage fund managers to use liquidity stress tests and authorities to establish a framework allowing the use of liquidity risk management tools.

¹² See Order no. 2017-1432 of 4 October 2017 modernising the legal framework for asset management and debt financing.

¹³ In France, real estate collective management vehicles are funds only made available to institutional investors (professional real estate collective investment undertakings – OPPCIs), or funds that target retail investors (real estate investment companies or real estate collective investment undertakings – SCPIs and OPCIs). SCPIs are quasi-closed-end funds and OPCIs and OPPCIs are encouraged to establish redemption limits.

Figure 23: Establishment of redemption rights by type of strategy

(as % of the number of funds and of net asset value)

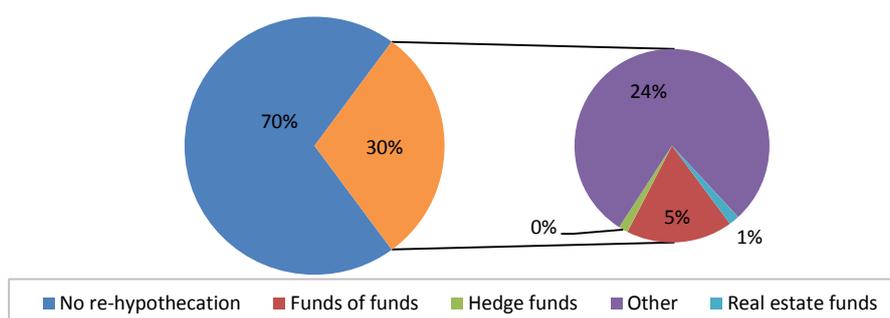


Source: AMF

Furthermore, funds can hold a portion of their assets in the form of cash or of securities capable of being liquidated rapidly. These reserves are not used to enter into transactions or as collateral, which means that their size provides some indication of the fund's ability to meet margin calls and absorb losses on positions, particularly in the case of derivatives-based strategies. Hedge funds hold the largest reserves (13% of their net asset value on a weighted average basis), along with private equity funds and real estate funds (each at 9%). At end-2016, European hedge funds also held 16% of their net asset value as reserves, while other funds held smaller amounts (4% and 5%, respectively, for private equity funds and real estate funds).

Lastly, the reporting also shows whether the AIF authorises the re-hypothecation of collateral placed with counterparties. Thirty percent of AIFs in asset terms (22% in number terms) authorise the re-use of collateral, primarily "other" strategy funds and funds of funds¹⁴. This percentage has been increasing since 2014 when it represented 25% of AIFs in number terms and 36% of total net asset value. For 99.9% of these AIFs and for all periods considered, the percentage of re-use of collateral by counterparties was 100%.

Figure 25: Net asset value-weighted percentage of AIFs that authorise their counterparties to re-hypothecate their collateral and types of AIFs



Source: AMF

¹⁴ In fourth-quarter 2017, the €203 billion in net asset value of AIFs authorising this re-hypothecation broke down into 79% "other" strategy funds and 18% funds of funds, with the other categories accounting for a negligible share.

An analysis of the match between the liquidity of portfolios on the asset side and the timing of investor redemptions on the liability side shows that it is satisfactory under normal conditions, according to asset managers. With the exception of real estate and private equity funds, whose holdings on the asset side are long term, a majority of other AIFs have liquidity on the asset and liability sides of less than one day.

In terms of the client base, funds are mainly held by professional investors, primarily hedge funds (100%), private equity funds (92%), “other” funds (62%), real estate funds (60%) and funds of funds (59%). In addition, AIFs have increased their implementation of liquidity management tools.

5. USE OF LEVERAGE

According to Article 4 of the AIFM Directive, leverage is defined as any method by which the management company increases the exposure of an AIF it manages whether through borrowing of cash or securities, or leverage embedded in derivative positions or by any other means¹⁵.

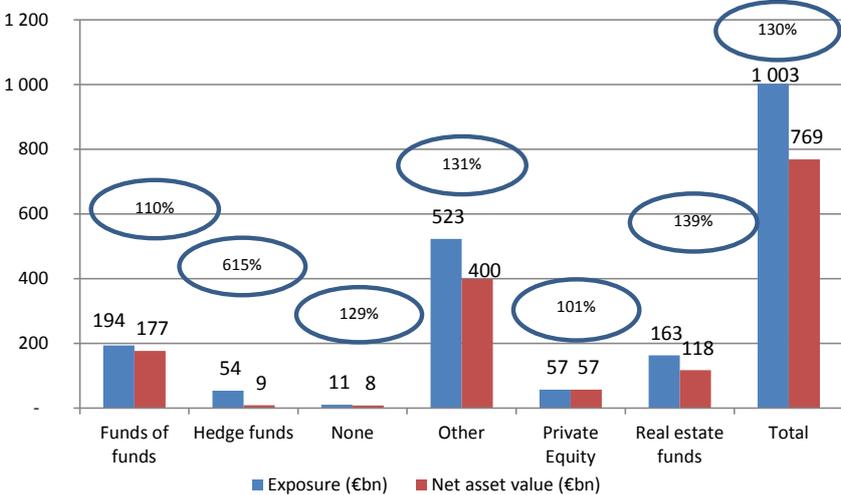
All management companies that would like to employ leverage undertake to present the policy adopted, set the maximum level of leverage authorised, inform investors of the circumstances under which they might employ leverage, and provide quantitative data to the competent authorities on leverage used on a substantial basis¹⁶ (where the AIF’s exposure is more than three times its net asset value).

AIFM reporting makes it possible to assess leverage through a variety of measures: ratio of assets under management to net asset value, financial leverage, synthetic leverage, and leverage calculated directly by the fund manager using the gross or commitment method.

Leverage estimated using the ratio of assets to net asset value

This is the ratio of a fund’s total exposure to its net asset value and is used to estimate the fund manager’s intention to increase the exposure of its AIF (Figure 26). Overall, funds with high exposure relative to their net asset value are, as expected, hedge funds, followed by real estate funds and funds that use “other” strategies.

Figure 26: Exposure (AuM) and net asset value (NAV) by investment strategy (€bn)



Source: AMF

Driven by high exposure to derivatives, the ratio is significant at the hedge fund level (615%), a trend that appears to be historically constant. To a lesser extent, the ratio is also systematically significant for real estate funds (139% in 2015, 2016 and 2017) and “other” funds (131% in 2017 compared with 132% in 2016). It nevertheless seems to have decreased for funds of funds (110% in 2017 compared with 120% in 2015) while it

¹⁵ The various possible methods as well as the conditions under which they allow an increase in the exposure of an AIF are explicitly stated in Annex I of the European Commission Regulation of 19 December 2012.

¹⁶ See Table 1 in section 1.1.

remains very moderate for private equity funds (101% in 2017 compared with 100% in 2015). It would be helpful to compare this level of leverage with the real level of leverage provided at the individual fund level; such an analysis will be undertaken at a later date.

Financial and synthetic leverage

Other variables can also be used to assess the financial leverage of AIFs, by comparing the amount and type of the funds’ borrowings (securities and collateralised or uncollateralised borrowings) to their net asset value. However, very few fund managers provide these optional variables (43% of quarterly reports leave blank the five variables describing the amounts and types of borrowings, representing 44% of the net asset value for the period).

By focusing here only on AIFs that have provided at least one response for these five variables¹⁷, the rate of borrowing to net asset value appears to be relatively low. On average, this financial leverage was 5% of net asset value, with a median of 0.03%, at end-2017, which means that some funds borrow more than the average. In reality, the types and amounts of borrowings vary widely by strategy: while “other” funds, private equity funds and funds of funds borrow only very marginally, real estate funds have significant collateralised and uncollateralised borrowings (each respectively 19% of weighted net asset value) and hedge funds use more collateralised borrowings via reverse repo or prime broker (respectively 6% and 3% of net asset value).

Figure 27: Net asset value-weighted financial leverage by strategy
(as % of weighted net asset value)

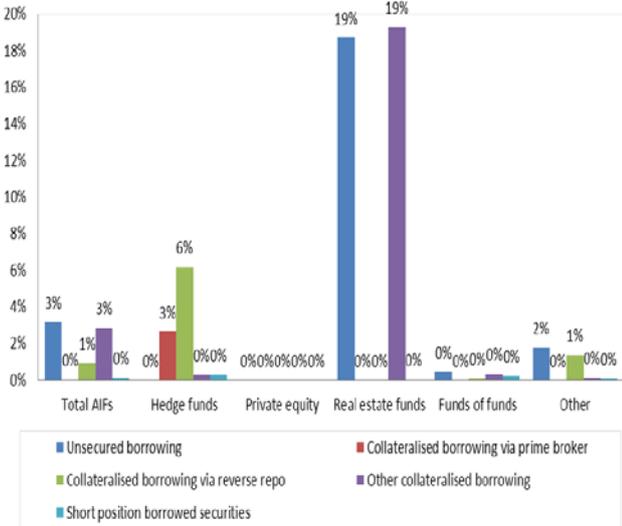
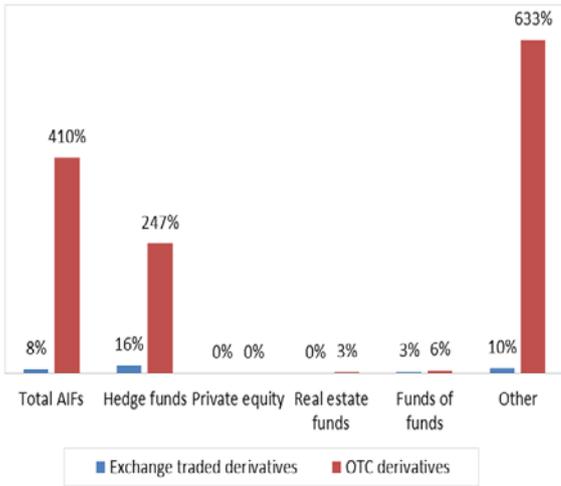


Figure 28: Net asset value-weighted synthetic leverage by strategy
(average, as % of weighted net asset value)



Source: AMF

Similarly, some of the synthetic leverage of AIFs can be observed through total exposure to over-the-counter derivatives or derivatives traded on a market. The responses to at least one of the two variables are not available for 40% of AIFs (39% of total net asset value). The average results were also strongly driven by certain funds, as at end-2017 the average net asset value-weighted exposure to derivatives was 448% of net asset value, with a median of 0. AIFs also used derivatives in different ways depending on their strategy: real estate funds, private equity funds and funds of funds made very little use of derivatives. Nevertheless, “other” strategy funds made extensive use of over-the-counter derivatives (633% of weighted net asset value), although this percentage is declining (827% at end-2016). Hedge funds also used over-the-counter derivatives (247% of weighted net asset value), to extents that fluctuated significantly by quarter (at end-2016, derivatives traded on the market represented 94% of weighted net asset value and over-the-counter derivatives 29%, with wide variations over the year).

¹⁷ Value of collateralised borrowing; amount of collateralised borrowing granted by a prime broker; value of collateralised borrowing via reverse repo; value of collateralised borrowing via another method; and short position borrowed securities. The sum of these five variables represents the entire market value of the AIF’s borrowings of cash and securities.

Leverage calculated by the fund manager

Box 2: Definition of leverage for AIFM

Leverage is expressed as the ratio between exposure and net asset value. It can be calculated in two ways: the gross method and the commitment (or net) method.

Gross method

This method defines leverage as the sum of the absolute values of all positions (with derivative instruments converted into their underlying instruments) excluding cash (and cash equivalents) and borrowings (unless they are reinvested) but including repo and reverse repo agreements. Gross leverage is therefore calculated as follows:

$$\text{Gross leverage} = \frac{\text{Direct investment} - \text{Cash equivalents} + \text{Derivatives} + \text{Borrowings} + \text{Reinvestment of collateral}}{\text{Net asset value}}$$

Net method

This method defines leverage as the sum of the absolute values of all positions (with derivative instruments converted into their underlying instruments) taking into account netting and hedging arrangements. Net leverage is therefore calculated as follows:

$$\text{Net leverage} = \frac{\text{Net risk} * + \text{Borrowings} + \text{Reinvestment of collateral}}{\text{Net asset value}}$$

* net risk: sum of exposures taking netting and hedging strategies into account.

The following table summarises the methods for calculating leverage while highlighting the instruments that are used in each case.

Table 3: Instruments included in the leverage calculation

Instrument	Commitment (UCITS)	Net exposure (AIFM)	Gross exposure
Assets (excluding derivatives)	NO	YES	YES
Derivatives (converted into their underlying instruments)	YES	YES	YES
Netting	YES	YES	NO
Hedging	YES	YES	NO
Cash	NO	YES	NO
Example: leverage of a fund with €100m in equities + €100m in derivatives of which €50m are used for hedging	50%	150%	200%

Source: AMF.

Based on the AIF reports collected in the 2015-2017 period, it is possible to evaluate average leverage by period; this calculation can be broken down into two dimensions: the investment strategy reported by the asset manager and the AIF's AMF classification as indicated in the AMF internal database (BIO).

Average leverage is calculated using the non-zero gross and net leverage entered in the AIF reports. Zero leverage situations will be examined at a later date.

Table 4: Average leverage by investment strategy

Reporting period/ Asset class	Equities			Bonds			Diversified funds			Real estate funds			Money market funds			Formula funds			
	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	
2015	Q1	109	100	87	132	103	139	123	107	178	193	172	48	121	113	58	249	184	17
	Q2	109	103	88	132	106	132	127	114	182	186	169	52	126	124	54	296	234	16
	Q3	109	103	81	138	107	131	117	106	186	174	162	53	137	134	54	295	240	16
	Q4/H2/Y1	111	102	90	124	107	131	119	108	174	167	163	64	119	114	52	233	180	16
2016	Q1	248	243	81	245	223	132	205	186	162	157	150	65	192	189	51	245	178	16
	Q2	107	101	82	149	108	135	117	106	164	243	217	68	111	108	56	248	184	16
	Q3	106	102	85	135	112	135	118	107	169	153	149	78	111	108	56	254	188	16
	Q4/H2/Y1	105	101	94	126	116	136	117	108	179	267	264	80	111	108	60	239	182	17
2017	Q1	105	101	94	216	112	136	119	109	175	169	161	84	109	109	59	239	177	23
	Q2	105	101	90	124	113	141	121	111	176	172	166	86	112	113	58	282	232	18
	Q3	104	101	93	124	112	133	120	110	174	167	160	91	100	100	58	222	183	19
	Q4/H2/Y1	105	101	99	123	110	131	114	108	191	188	178	99	100	99	57	215	188	19

Source: AMF. The above tables only consider strictly positive leverage. Leverage is expressed as a % of the net asset value driven by the strategy in question.

Note: Average gross and commitment leverage for real estate funds at end-2017 (all reporting frequencies combined) stood at 195% and 185%, respectively. The net asset value corresponding to this strategy was €110bn.

Table 5: Average leverage by asset class

Reporting period/ Investment strategy	Funds of funds			Hedge funds			Private equity funds			Real estate funds			None			Other				
	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)	Gross leverage	Commitment leverage	Net asset value (€bn)		
2015	Q1	113	100	154	357	301	6	95	101	3	200	181	49	115	114	9	139	116	383	603
	Q2	110	103	148	383	305	5	95	100	3	185	169	53	114	121	9	148	127	379	596
	Q3	109	102	144	505	347	4	203	208	5	176	168	54	118	121	8	140	123	360	575
	Q4/H2/Y1	108	100	153	635	486	6	95	97	20	174	169	64	105	105	11	132	116	372	625
2016	Q1	110	102	144	873	673	4	98	101	5	172	168	66	115	132	8	283	259	353	580
	Q2	104	95	152	901	716	6	97	101	3	237	213	70	125	133	7	138	116	356	593
	Q3	110	102	153	1141	931	6	97	102	3	154	149	79	151	141	4	132	118	368	613
	Q4/H2/Y1	106	100	174	1203	852	6	97	95	40	275	274	80	108	106	10	130	117	381	691
2017	Q1	108	102	168	1293	1076	6	100	103	10	180	176	85	155	149	6	152	118	388	663
	Q2	107	102	167	1451	1301	6	99	101	10	185	184	88	136	134	8	138	125	387	665
	Q3	107	103	167	1991	1844	5	100	102	12	180	174	102	132	128	8	130	118	374	667
	Q4/H2/Y1	106	102	175	764	585	5	95	99	46	195	185	110	129	123	10	125	116	398	745

Source: AMF. The above tables only consider strictly positive leverage. Leverage is expressed as a % of the net asset value driven by the asset class in question.

Note: Average gross and commitment leverage for bond funds at end-2017 (all reporting frequencies combined) stood at 123% and 110%, respectively. The net asset value corresponding to this asset class was €131bn.

As can be seen, average leverage can vary widely based on the strategy used by the AIF and its asset class. Although historically the level of leverage for certain types of AIFs has generally decreased, it is difficult to establish very clear trends based on these data. Furthermore, the level of average leverage has fluctuated quite widely in certain periods, which would suggest there may be some issues with the reliability of the information entered. Nevertheless:

- For funds of funds and private equity funds, gross leverage appears to be positioned at around 100% of the category's net asset value; real estate funds have a higher level of leverage, ranging on average from 150% to 200%. Leverage at hedge funds is much more substantial and volatile. For "other" strategy funds, representing more than 50% of assets received via AIF reporting, average leverage is between 130% and 150%.
- An analysis of AIFs at the asset class level shows that money market funds and equity funds report the most moderate leverage, ranging from 100% to 120% of the net asset value of their asset class. Higher levels are observed for diversified funds and bonds (125%-140%). Lastly, the leverage of formula funds often exceeds 250%.
- Leverage appeared to be problematic in Q1 2016, as it was abnormally high for most of the principal asset classes. The significant volatility in hedge funds' leverage, in particular in 2017, bears further analysis. In light of the figures, it would be beneficial to expand the data consistency checks; the results for the periods in question should be treated with caution.

The leverage levels of AIFs that report in France overall seem consistent with their strategies: at end-2017, private equity funds, funds of funds and "other" strategy funds had low leverage, while real estate funds and hedge funds had more substantial leverage. Beyond this analysis at the aggregated level, an analysis was conducted on a fund-by-fund basis to verify that there was no excessive risk taking in funds with atypical levels. The quality of these data nevertheless appears to be problematic for certain AIFs or certain periods: the AMF has therefore launched an effort to improve their reliability.

These different leverage measures allowed under AIFM reporting offer a European response to IOSCO's various proposals for monitoring leverage¹⁸. IOSCO recently submitted for public consultation proposals for comparable techniques for measuring funds' leverage at the international level, to help the national authorities identify the fund(s) that could pose a risk to financial stability¹⁹. To that end, the approach proposed comprises a two-step process: (i) a matrix of simple techniques based on the funds' exposure (gross, adjusted gross and net) used to break down leverage by asset class; and (ii) for funds that warrant closer scrutiny by the regulator, an examination of supplementary data (the choice of which is left to discretion of the national authorities) to better understand the figures and identify potential risks. While the results of these measures will not be perfectly comparable, they will make it possible to identify funds presenting systemic risk potentially, in a consistent manner and from one jurisdiction to another.

6. ANALYSIS OF RISK MEASURES – FOCUS ON VALUE AT RISK

Under Article 15 of the AIFM Directive, asset managers are required to implement appropriate risk management systems in order to measure and monitor the risks relevant to each investment strategy and to which each AIF is or may be exposed. They must also ensure that the risk profile of the fund corresponds to its size, portfolio structure and investment objectives as laid down in the AIF's instruments of incorporation and marketing materials. AIFM reporting also includes a section on the risk measures that the asset manager calculates for each AIF, taking into account all positions taken by the portfolio: IRR, CS01, DV01, Net Equity Delta, Net Commodity Delta, Net FX Delta, Vega Exposure and Value at Risk or VaR.

As these risk measure variables are optional, the completion rate is fairly low. At end-2017, VaR had been reported for only 33% of the funds required to report on a quarterly basis; for funds required to report on a half-yearly or annual basis, this rate does not exceed 4%. Furthermore, this indicator appears to be unsuitable for certain investment strategies, namely those of real estate funds, private equity funds and funds that do not report a primary strategy, as VaR is consistently not provided for the funds in question.

Box 3: Definition of the main risk measures and their calculation methods

VaR corresponds to the loss that a position could incur at a given time horizon and at a certain level of probability. **The VaR disclosed is most commonly a 95% 20-day VaR.** Asset managers are also asked to specify the method used to calculate this risk measure: historical, parametric, or Monte Carlo.

Historical VaR

This method requires knowledge of the value of the position; for a portfolio, this means reconstructing its past value based on the price of various assets and its current composition and building its empirical distribution in order to derive the quantile (at 95% for example).

Its advantage is that it is easy to implement and that no prior assumptions about the shape of the distribution are required. In contrast, the volume of historical data must be sufficiently large compared with the VaR horizon but also not too large so as to ensure that the probability distribution has not changed too much over the period. This approach could, moreover, pose problems if major crises are not included in the time sample considered. In addition, this method is not suitable for derivative products.

Parametric VaR

This approach involves breaking down the instruments that make up the position according to different risk factors (equity indices, exchange rates, etc.) and determining a probability distribution for each risk factor; this makes it possible to define an analytical expression of VaR.

The main drawback to this method is the large number of assumptions to be made that often do not reflect reality (linear approximation of options profiles, Gaussian profitability of the assets, etc.).

Monte Carlo VaR

As with the parametric method, the VaR calculation relies on an estimate of the probability distributions of risk factors. These distributions do not have to be simplified. Moreover, the valuation of the position based on risk factors is also not necessarily linear (options pricing). Through Monte Carlo simulations, a sufficiently long sample is produced, encompassing variations in the value of the position. VaR is calculated based on this sample, as with a historical VaR.

This approach offers considerable flexibility, given that the risk factors can follow any probability distribution and that the position can

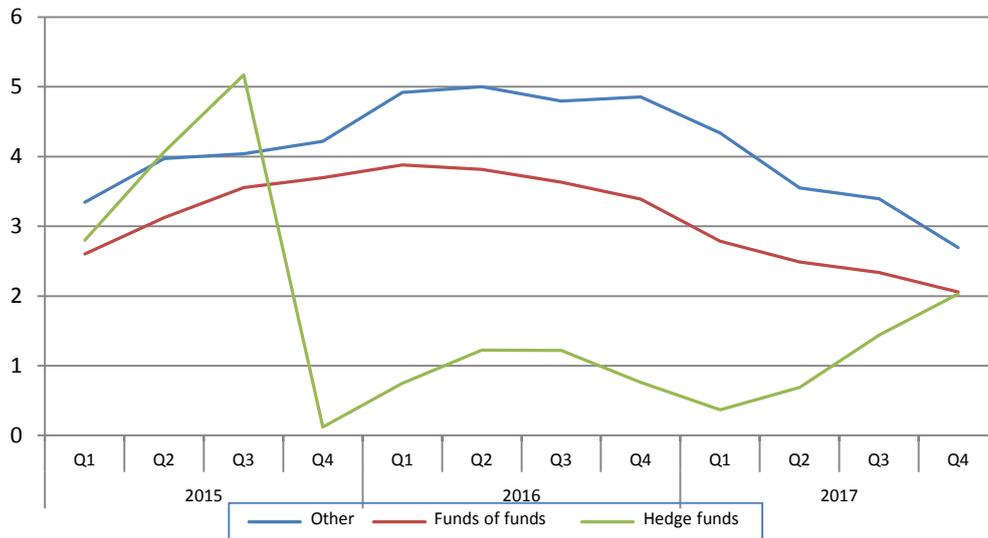
¹⁸ IOSCO was mandated in January 2017 to propose technical recommendations regarding liquidity management tools at funds and measures for assessing leverage. See FSB (2017), "Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities", January.

¹⁹ This public consultation was published in mid-November 2018 and is open until 1 February 2019: <https://www.iosco.org/news/pdf/IOSCONEWS515.pdf>

contain options products. However, it can be particularly expensive and cumbersome to implement and the calculation can take a long time.

Monte Carlo simulations are used to a much greater extent (71% of funds) while historical VaR is calculated for only 29% of funds. Within the “Other” strategy, however, historical VaR is used more frequently than Monte Carlo VaR (52% compared with 41% at end-2017).

Figure 29: Change in net asset value-weighted VaR by investment strategy
(as % of net asset value by strategy)

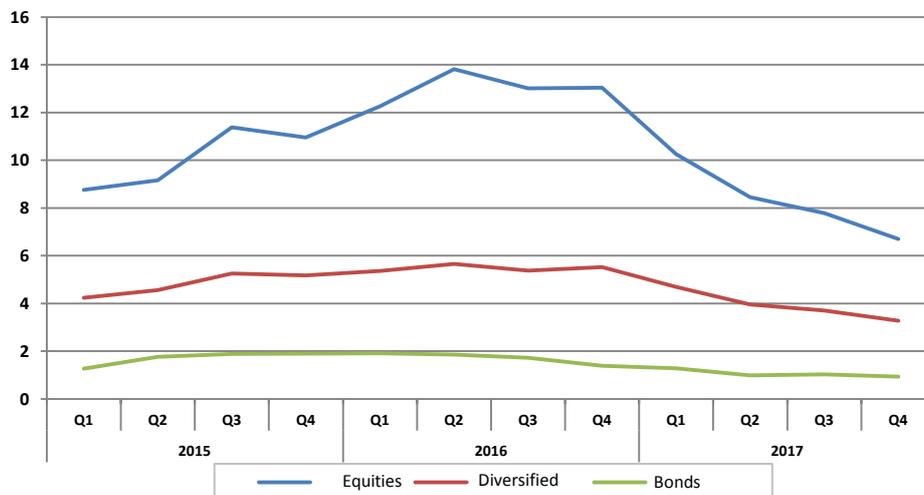


Source: AMF

A fairly sharp downward trend has emerged at the VaR level since second-half 2016 for funds of funds and for the “other” strategy. The increase in average VaRs reported at the beginning of 2016 can be attributed largely to the Brexit decision and to volatility on the Asian markets. Hedge funds’ VaRs look more volatile but have been at fairly low levels since end-2015. This figure should be treated with caution given the small number of hedge funds that provide a VaR. It should be noted that VaR seems to measure quasi-contemporaneous volatility over the period under review.

VaR is also examined based on asset class by focusing in particular on equity, bond and diversified funds.

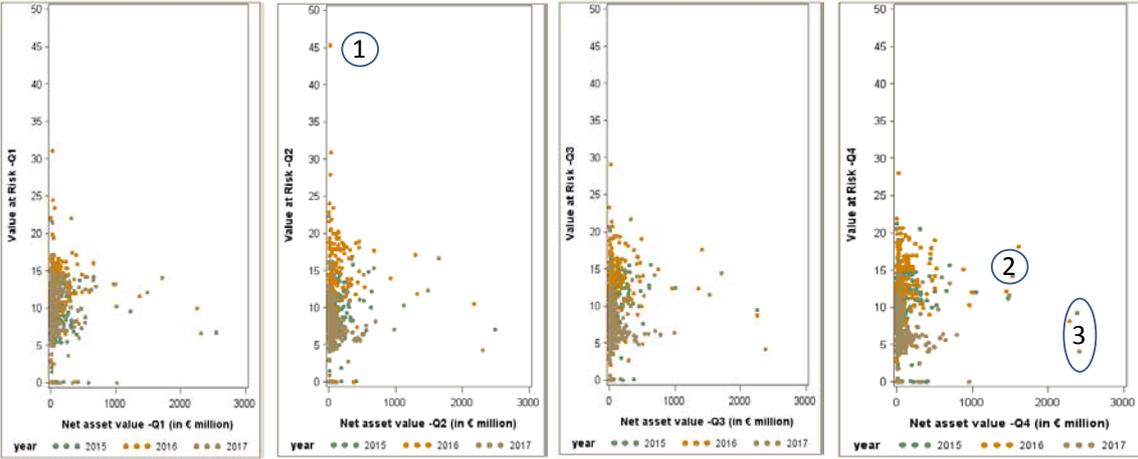
Figure 30: Change in net asset value-weighted VaR by AMF asset class
(as % of net asset value by strategy)



Source: AMF

In terms of trends, the same conclusion can be drawn as for investment strategies, although the level of VaR is often substantially different. The weighted average VaR of equity funds was above 10% from mid-2015 to mid-2017, and peaked at 14% in early 2016 during the volatility crisis on the Asian markets. On the other hand, bond funds reported a low VaR that remained under control over time, ranging between 1% and 2%.

Figure 31: Dispersion of gross VaR by net asset value for equity funds
(as % of net asset value)



Source: AMF

The above figure shows that the gross VaR of equity funds with less than €500 million in assets ranges from 5% to 15%. Its median was 8% at end-2017, down 2.5% and 3.5% compared with end-2015 and end-2016, respectively.

After rising steadily in 2016 due to volatility on the Asian markets and the Brexit announcement, VaR has declined gradually across all strategies and asset classes.

Box 4: First AIFM reporting figures presented at the European level

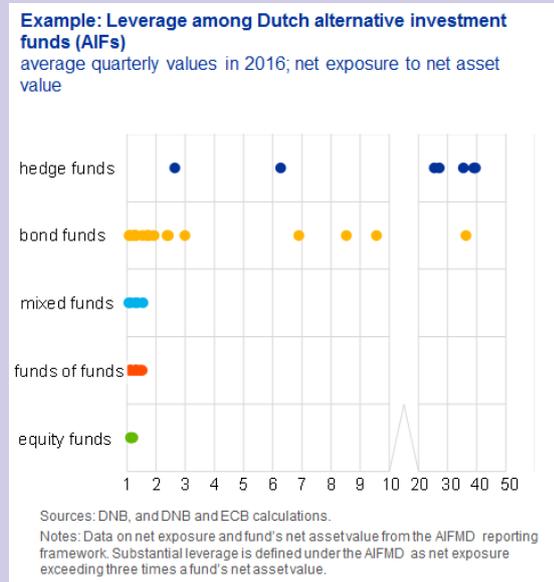
Article 25 of the AIFM Directive specifies that ESMA and the ESRB are to receive the information gathered by the National Authorities through AIFM reporting. Since 2014, a number of technical issues have prevented ESMA from having sufficient scope at the European level to perform the relevant statistical analyses. For the first time, in 2018 ESMA published analyses based on AIFM reporting at end-2016, covering 60% of AIFs managed or marketed in Europe²⁰. ESMA stressed that the quality of the data is still inadequate, in particular for certain variables such as leverage reported by asset managers. ESMA also aims to propose an annual analysis of AIFM reporting as from 2019 and is working with the national supervisory authorities to improve the quality of these data.

The initial findings derived from AIFM reporting at the European level are largely consistent with the French conclusions. They show that assets are concentrated among a few large-scale AIFs and that use of the European management or marketing passport is widespread (80% of AIFs). Registered AIFs, which can be marketed only in the countries in which they are registered, are smaller (average net asset value of €50 million, median of €10 million) than authorised AIFs (average of €160 million, median of €30 million). AIFs are primarily exposed to Europe (70%), but are on average more exposed than AIFs reporting in France to North America (11% of total net asset value) and to Asia (4%, compared with 1.2% for AIFs reporting in France). They also point to a large majority of “other” strategy funds (67% of total net asset value observed) and open-ended funds (70% in number terms and 80% of net asset value), and indicate that the AIFs are mostly offered to institutional investor clients (40% of investors are insurance corporations or pension funds).

They show that, at the European level, the liquidity profile of real estate AIFs and funds of funds is inadequate, with liquidity on the liability side more limited than on the asset side, unlike funds reporting in France on average. Lastly, some information is presented on European hedge funds (2% of total net asset value), highlighting significant cash holdings (on average more than 15% of their net asset value) and the use of more varied funding sources than other strategies (reverse repos, short-term collateralised and uncollateralised borrowings, etc.).

²⁰ ESMA (2018), “AIFMD – a framework for risk monitoring”, in *ESMA Report on Trends, Risks and Vulnerabilities*, February.

The European Central Bank also used AIFM reporting data from the Netherlands, whose AIFs represent 14% of the total net asset value of the European Union according to EFAMA (€806 billion), to propose measures for macroprudential leverage limits²¹. Dutch funds, in particular hedge funds and bond funds, have substantial leverage (figure below), resulting in the need to implement supervisory measures for all European funds.



7. POSSIBLE RISK MONITORING INDICATORS

In order to more thoroughly mine the AIFM data for stakeholder monitoring and risk supervision purposes, it should be possible to build synthetic indicators based on the different information provided through fund manager and AIF reporting, as well as to perform ad hoc analyses to identify the types of funds that could present a fairly high risk.

An analysis is proposed below that consists of identifying niches of funds likely to have a particularly high level of risk based on different predetermined criteria. This approach would be suitable for supervision at the entity level and could be used to identify potentially risky funds that warrant a more in-depth analysis. An outline of the method used and of the key results obtained is provided as an example of the analytical opportunities that AIFM data may offer.

The indicators and methods proposed are in the exploratory phase and highlight only a few possible uses of the reporting for the purpose of supervising and monitoring the risks of AIFs marketed in France.

Methodology

- Risk is assessed using three indicators:
 - portfolio liquidity: based on the liquidity specified for each tier, average liquidity is calculated at the fund level (on a number of days basis);
 - gross leverage;
 - VaR.
- As the liquidity and VaR indicators are optional, the analysis is limited to Q3 2017 funds for which at least two of the three risk measures were supplied; a temporal and structural validation of the segments selected was performed on the Q4 2016 and Q4 2015 data.
- This analytical method was tested on several variables relating to the assets: the predominant fund type, the primary investment strategy used, the fund's exposure class and subclass, the portfolio's most important concentration, and the fund's asset class.

²¹ See Van der Veer, K., Levels, A., Lambert, C., Molestina Vivar, L., Weistroffer, C., Chaudron, R. and de Sousa van Stralen, R. (2017), "Developing macroprudential policy for alternative investment funds – Towards a framework for macroprudential leverage limits in Europe: an application for the Netherlands"; ECB Occasional Paper, No 202, 30 November 2017.

The most relevant data on risk were observed by focusing on the exposure classes, the exposure subclasses, and the primary investment strategy.

Since their exposure and leverage are often substantial and likely to introduce significant bias into the calculation of the different measures, hedge funds have been excluded from the segmentation presented below. The second step will be to perform an analysis dedicated to this fund typology.

Risk indicators by exposure class (excluding hedge funds)

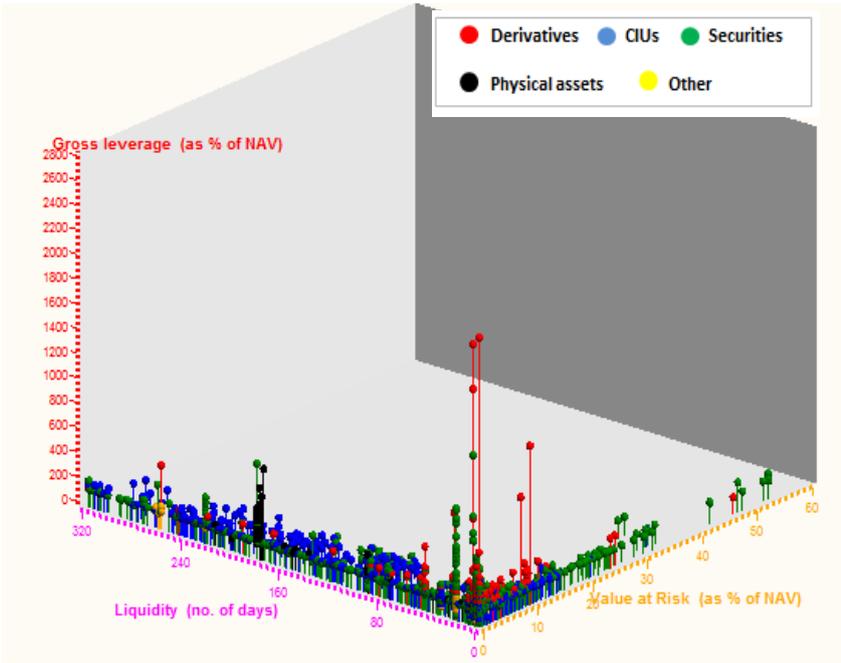
Table 6: Risk indicators by exposure class (excluding hedge funds)

Principal exposure	No. of funds	Average leverage (as % of NAV)	Median leverage (as % of NAV)	Average liquidity (no. of days)	Median liquidity (no. of days)	Average VaR (as % of NAV)	Median VaR (as % of NAV)
CIUs	2 085	105	100	90	2	4	4
Derivatives	288	258	182	23	2	3	1
Other	152	105	101	76	19	3	1
Physical assets	261	179	121	301	365	3	1
Securities	2 355	119	100	87	5	5	3

Note: On average, the 288 funds reporting a principal exposure to derivative products have average leverage of 258%, well above that observed for the other classes; their liquidity is high, as the portfolios can be liquidated in about 23 days. VaR is 3%, below the level observed for securities and CIUs.

Source: AMF

Figure 32: Scatter plot of AIFs (excluding hedge funds) based on the three risk measures: liquidity, leverage and VaR



Note: The chart presents the three (unweighted) risk indicators for all AIFs within the scope of the analysis. It shows which segments could be riskier according to one or more measures.

Source: AMF

The analysis shows that:

- funds with high exposure to derivatives products have substantial leverage: 10 funds with gross leverage of more than 500% and other segments with average leverage of more than 250% were identified; some of these funds have low liquidity or a fairly high VaR;
- among the funds that are principally exposed to securities, there is a specific set with a significant VaR (equity exposure) but there are funds that also have low liquidity or report high leverage;

- real estate funds with high exposure to physical assets naturally have very low liquidity and relatively high leverage.

Risk indicators by exposure subclass – focus on funds exposed to derivatives

The previous figure highlighted different fund segments exposed to derivative products that appear to have a high level of risk. To better understand these segments, they are examined according to the exposure sub-strategy specified so as to determine which sub-strategies primarily carry this risk.

Table 7: Risk indicators by exposure subclass (derivatives)

Principal exposure	No. of funds	Average leverage (as % of NAV)	Median leverage (as % of NAV)	Average liquidity (no. of days)	Median liquidity (no. of days)	Average VaR (as % of NAV)	Median VaR (as % of NAV)
Index CDS	3	2 822	2 234	5	5		
Interest rate derivatives	26	557	196	32	2	1	1
Equity derivatives (financial institutions)	4	421	292	251	329		
Single name financial CDS	2	297	297	5	5		
Foreign exchange (for investment purposes)	30	247	203	15	14	5	4
Foreign exchange (for hedging purposes)	31	208	193	65	5	1	1
Fixed income derivatives	44	207	163	15	2	2	1
Other equity derivatives	46	196	195	2	2	5	3
Precious metals/other	1	180	180	2	2	2	2
Other derivatives	100	165	160	16	2	2	-
Other CDS	1	44	44	8	8	5	5

Source: AMF.

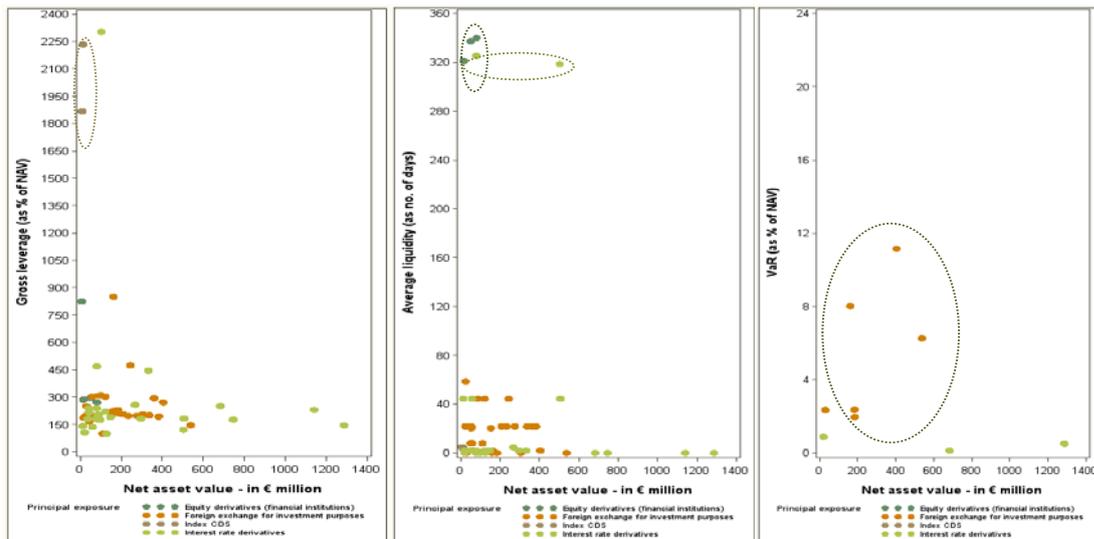
Note: Four funds exposed to equity derivatives with high average leverage of 421% and very low liquidity (portfolio capable of being liquidated in about 215 days).

Four exposure sub-classes that potentially have a higher level of risk can be identified:

- **Index CDS:** three funds with leverage above 1 800%;
- **Interest rate derivatives:** leverage stands at about 200% for this segment; four funds identified with more atypical leverage and/or liquidity;
- **Equity derivatives related to financial institutions:** four funds with high leverage and liquidity;
- **Foreign exchange for investment purposes:** 30 funds identified with average leverage of 250% and a fairly high VaR.

These segments are presented by level of risk in the following figure:

Figure 33: The most risky derivatives exposure sub-classes



Source: AMF

Hedge funds with high leverage

At the hedge fund level, an individual analysis proved to be more relevant.

Table 8: Risk indicators by exposure subclass (excluding hedge funds)

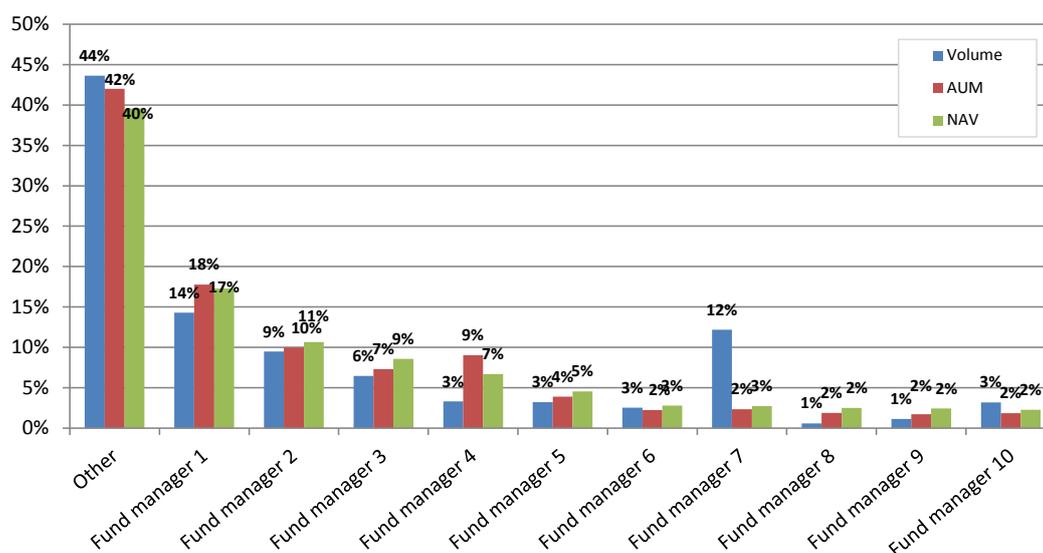
Fund name (hedge fund)	AMC name	Exposure subclass	Q3 2017			Q4 2016		
			Gross leverage (as % of net asset value)	Exposure (€m)	Net asset value (€m)	Gross leverage (as % of net asset value)	Exposure (€m)	Net asset value (€m)
Fund 1	Fund manager 1	Interest rate derivatives	19 841	18 019	90	5 398	6 564	120
Fund 2	Fund manager 2	Interest rate derivatives	13 026	5 772	38	14 748	7 628	47
Fund 3	Fund manager 3	Interest rate derivatives	11 526	22 802	198			
Fund 4	Fund manager 4	Interest rate derivatives	8 794	7 681	78	14 860	15 114	94
Fund 5	Fund manager 5	Fixed income derivatives	3 587	623	35	7 935	1 809	70
Fund 6	Fund manager 6	Interest rate derivatives	2 029	1 317	62	3 507	2 978	83
Fund 7	Fund manager 7	Interest rate derivatives	1 656	8 452	503			
Fund 8	Fund manager 8	Exotic CDS	1 627	3 352	203			
Fund 9	Fund manager 9	Interest rate derivatives	1 623	675	42	1 032	603	57
Fund 10	Fund manager 10	Interest rate derivatives	1 588	754	47	992	568	56
Fund 11	Fund manager 11	Other listed equities	99	1 749	1 752	100	1 622	1 625

Source: AMF.

For most of the funds listed in the table, leverage trended down over the period.

Another possible study, which would provide more insight into the level of risk borne by major market stakeholders and help strengthen supervisory tools, would be to break down the different indicators analysed thus far by fund manager.

Figure 34: Breakdown of number of funds, NAV and assets for the largest management companies at end-2017 (as % of total)



Source: AMF

A focus on the 10 largest asset management companies in terms of net asset value managed shows that they represented 60% of total NAV at end-2017 for 56% of the total fund volume. It is also worth noting that asset manager profiles at the exposure-to-NAV ratio level are fairly similar; this would suggest minimal disparities in terms of the use of leverage among fund managers. The chart also shows that average assets are at the same level overall, regardless of company; there are two exceptions, however: for *fund manager 4*, average assets by fund seem fairly high (3% of funds for 7% of assets) while for *fund manager 7* the result is the reverse (12% of funds for only 3% of assets).

Table 9: Change in risk indicators by asset management company

AMC	Volume	Asset Under Management			NAV			Liability liquidity (0-7 days)			Portfolio liquidity (0-7 days)			Gross leverage			VaR		
		Q4 2017 (£bn)	Q4 2016 (£bn)	Chg (%)	Q4 2017 (£bn)	Q4 2016 (£bn)	Chg (%)	Q4 2017 (%)	Q4 2016 (%)	Trend	Q4 2017 (%)	Q4 2016 (%)	Trend	Q4 2017	Q4 2016	Trend	Q4 2017	Q4 2016	Trend
Other	2255	385	310	24%	273	245	11%	43%	50%	↔	60%	64%	↔	137	160	↔	2.5	4.2	↔
Fund manager 1	739	163	181	-10%	119	103	16%	12%	13%	↔	68%	70%	↔	124	162	↔	1.1	1.1	↔
Fund manager 2	490	91	88	3%	74	69	6%	76%	77%	↔	82%	83%	↔	110	111	↔	1.9	3.7	↔
Fund manager 3	334	67	62	7%	59	56	6%	96%	96%	↔	90%	89%	↔	102	95	↔	2.4	4.7	↔
Fund manager 4	171	83	88	-6%	46	48	-3%	29%	29%	↔	79%	81%	↔	176	189	↔	0.4	0.3	↔
Fund manager 5	166	36	32	13%	31	28	10%	95%	95%	↔	97%	92%	↔	124	120	↔			↔
Fund manager 6	131	20	22	-6%	19	21	-7%	91%	92%	↔	83%	91%	↔	108	99	↔			↔
Fund manager 7	629	21	20	5%	19	18	3%	65%	86%	↔	88%	89%	↔	112	110	↔	5.3	5.0	↔
Fund manager 8	31	17	16	9%	17	16	10%	100%	100%	↔	100%	100%	↔	96	95	↔			↔
Fund manager 9	58	16	15	6%	17	16	6%	100%	100%	↔	0%	0%	↔	100	100	↔	4.4	7.0	↔
Fund manager 10	165	17	17	0%	16	16	-1%	10%	12%	↔	71%	75%	↔	106	108	↔			↔

Source: AMF

At the three largest asset management companies, there is a downward trend at the exposure level or a smaller increase than was seen in net asset value between end-2016 and end-2017; this is consistent with the fairly steep decline in leverage observed over the same period. In contrast, the opposite conclusion can be drawn for the other fund managers in the ranking. Liquidity on both the asset and liability sides seems to have declined slightly for some fund managers but the changes do not look alarming. Significant variations were found, however, in liability liquidity for the different fund managers, notably due to methodological differences and whether or not settlement periods were included in the calculation. Lastly, VaR moved downward for almost all fund managers in 2017, a trend that can be explained by a normalisation following the volatility crisis on the Asian markets and the Brexit announcement, which had pushed VaR higher in 2016.

APPENDIX: DETAILED SCOPE OF THE DIRECTIVE, REQUIREMENTS AND IMPACTS ON MANAGEMENT COMPANIES

As defined in the AIFM Directive, an asset manager is a legal person whose regular business is managing one or more AIFs. Management of AIFs is itself defined as performing at least portfolio management and risk management functions for one or more AIFs.

Funds defined as AIFs are those covered by Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011:

- collective investment undertakings that raise capital from a number of investors, with a view to investing it in accordance with a defined investment policy for the benefit of those investors (AIFs by purpose or “Other AIFs”);
- funds that are not UCITS under Directive 2009/65/EU (UCITS IV).

The definition of AIF also includes collective investment undertakings (CIUs) covered by the law and AIFs by nature. These are mainly non-coordinated CIUs (Article L. 214-1 of the Monetary and Financial Code), i.e. non-coordinated retail funds, retail private equity investment funds (FCPRs), real estate collective investment undertakings (OPCIs), real estate investment companies (SCPIs), forestry investment companies (SEFs), employee savings funds (FCPEs), SICAVs for employee shareholders (SICAVAS), closed-end investment funds (SICAFs), and securitisation vehicles. Certain venture capital companies (SCRs), civil partnerships (SCIs) and other real estate companies may meet this definition.

Some vehicles are, however, excluded from the regulations deriving from the AIFM Directive:

- holding companies, i.e. companies with shareholdings in one or more other companies, the commercial purpose of which is to carry out a business strategy or strategies through its subsidiaries, associated companies or participations in order to contribute to their long-term value;
- AIFs open only to entities belonging to the same group, in other words, when the fund manager only manages one or more AIFs whose only investors are the fund manager itself, or the subsidiaries of this fund manager, or the companies of which the fund manager is the subsidiary, or other subsidiaries of these companies provided that none of these investors are themselves AIFs.

Requirements

To achieve greater transparency, the Directive imposes a set of requirements on fund managers:

- liquidity management for open-ended AIFs: systematic monitoring of liquidity risk and stress tests under normal and exceptional market conditions; implementation of liquidity management tools ensuring fair treatment of investors;
- stricter and more formalised regulation of the conditions for delegation of management to a third party with the delegator maintaining responsibility;
- designation of a single depository for each AIF which will be responsible for monitoring liquidity, in addition to its usual duties;
- review and implementation of a compensation policy that deters risk-taking;
- independent valuation of the AIF’s assets, by the management company or an external valuer; however, responsibility for the valuation lies entirely with the company;
- capital requirement;
- reporting to investors (before subscription, periodic and annual report);
- reporting to regulators: on the composition of the assets, stress test results, substantial leverage.

Impacts of the Directive on management companies

A distinction should be made between three situations in which the Directive has an impact on management companies:

- **asset management companies whose AIF assets under management are above the thresholds set by the Directive:** this concerns AIF managers whose assets exceed a threshold of €100 million and where at least one of the AIFs managed employs leverage or includes a redemption right for a period of five years from the investment date. Additionally, AIF managers that have a net asset value in excess of the €500 million threshold are systematically concerned.

These AIFMs, which have assets under management in excess of the above-referenced thresholds, are required to submit full reporting. This includes the information on the basic forms pursuant to Article 24.1 of the AIFM Directive plus, for each AIF, the information required under Article 24.2 of the Directive. The reporting frequency will be quarterly, half-yearly or annual depending on the assets under the company's management. Fund managers managing one or more AIFs that employ leverage on a substantial basis (where exposure is more than three times net asset value) are also required to submit to the regulator the supplemental form on leverage with the same frequency.

AIFMs must submit this detailed information only for EU AIFs or third-country AIFs marketed in the European Union. Master and feeder funds are subject to separate reporting. Similarly, each sub-fund of an AIF will have to submit its own reporting.

- **Asset management companies whose AIF assets under management are below the thresholds set by the Directive:** in principle, these management companies are not subject to the entire Directive and need only transmit the basic forms on an annual basis – “lighter” reporting (Article 3.3 of the AIFM Directive). This consists of information on the AIF managers and, for each vehicle managed, information on the AIFs. However, they cannot benefit from the passport introduced by the Directive. If they would like to use it, they have to opt in to full application of the Directive and submit to all the requirements set out therein.
- Asset management companies excluded from the scope of the AIFM Directive: this concerns management companies that only manage securitisation special purpose vehicles or AIFs whose investors are exclusively management company group entities (unless the investor in these AIFs is itself an AIF). These companies are not subject to any provisions of the Directive and cannot benefit from any of the rights granted.

A few examples help illustrate the three scenarios described above:

- An asset management company that manages more than €100 million in assets of AIFs, at least one of which provides for a gates mechanism, is subject to the Directive;
- An asset management company managing several OPCIs has physical assets worth a total of €80 million and uses debt to fund its property acquisitions: assuming that all its funds have a total of €10 million in cash and half of the property acquisitions are funded through debt, this means that the value of the properties is €140 million (since, in that scenario, the funds would have borrowed €70 million). It is therefore fully subject to the Directive, as its €140 million in assets is above the €100 million threshold;
- An asset management company manages five FCPRs and one contractual UCITS for total assets of €180 million. None of the FCPRs use leverage and their redemptions are subject to a 10-year lock-up period. However, redemptions may be made at any time for a contractual UCITS. As redemptions are open for at least one AIF, the management company is fully subject to the Directive;
- An asset management company manages €150 million, of which €60 million for a contractual UCITS with leverage and €90 million for a coordinated UCITS. According to the AIFM Directive, the company manages only €60 million; it is below the €100 million threshold and is not subject to the Directive.