Financial Services Authority

Assessing the possible sources of systemic risk from hedge funds

A report on the findings of the FSA’s Hedge Fund Survey and Hedge Fund as Counterparty Survey

August 2012
Executive summary

This paper sets out the results of our latest Hedge Fund Survey (HFS) conducted in March 2012 and the Hedge Fund as Counterparty Survey (HFACS) conducted in April 2012.

The key findings of the March 2012 HFS and April 2012 HFACS are:

- Aggregate assets under management increased in the survey period, predominantly due to positive returns, but also helped by generally positive net subscriptions. Aggregate assets below their high-water mark (HWM) have remained stable and low.

- The footprint of surveyed hedge funds is modest in most markets when measured by the value of their exposures and by turnover. Possible exceptions are the convertible bond, interest rate derivative and commodity derivative markets. The HFS only provides a partial view of global hedge fund exposures and so, globally, hedge funds will have a bigger footprint.

- Leverage remains largely unchanged and modest for most funds. Fixed-income arbitrage strategies report the highest leverage, both in terms of gross exposures relative to Net Asset Value (NAV) and total borrowings relative to NAV. Most cash (or on-balance sheet) leverage comes from repo borrowing, which is continually rolled; however, borrowing from this source has declined in aggregate in the latest survey. Understanding the source of hedge fund borrowings is important in assessing systemic risk through ‘market’ and ‘credit’ channels. The latest survey results suggest that unencumbered cash as a multiple of total borrowing has declined in aggregate.

- In aggregate, surveyed hedge funds report that they are able to liquidate their assets in a shorter timeframe than the period after which their liabilities would fall due. Almost all funds state that they can suspend investor redemptions and/or create side pockets, and over half report that their investors have side letters. Nonetheless, there is still a risk of a sudden withdrawal of funding during stressed market periods (such as a withdrawal of repo financing), resulting in forced asset sales.

- Counterparty exposures of surveyed hedge funds remain fairly concentrated among five banks. From the banks’ perspective, they have tightened financing terms for hedge funds post-crisis, increasing their resilience to hedge fund defaults.

- Measures of portfolio concentration, including qualifying funds’ top ten positions as a percentage of gross market value (GMV) and the number of open positions, has remained largely unchanged for most surveyed funds.

We intend to repeat the HFS in September 2012 and the HFACS in October 2012. This will enable us to continue to build a time series of data.
Background

Hedge funds did not play a major role in the financial crisis, but they have the potential to pose systemic risks to financial stability if they are individually very large or leveraged. The HFS and HFACS are important tools in assessing the nature and extent of risks to financial stability from outside the boundary of regulation, as well as bank and prime broker interactions with the hedge fund industry. We conduct both surveys every six months to examine and identify these risks, and to inform our supervisory work.

We consider two channels through which financial stability may be affected by hedge funds: the ‘market’ channel where market dislocations disrupt liquidity and pricing, and the ‘credit’ channel where failure of a hedge fund (or a group of hedge funds) leads to losses by banking, brokerage and other counterparties. We can use the way we supervise banks and brokers to help mitigate risks through the ‘credit’ channel. It is harder to mitigate risks through ‘market’ channels as hedge funds tend to be domiciled offshore.

It is important to recognise the surveys’ limitations when examining the results. The HFS is voluntary and surveys a sample of hedge funds as selected by the FSA. It therefore provides only a snapshot of the hedge fund industry. Similarly, the HFACS provides a partial view of the exposures of FSA-authorised banks to hedge funds; it may not be possible to extrapolate the results to be representative of the global brokerage industry. In addition, although the survey samples remain largely consistent between survey periods and general year-on-year trends can be identified, it is not possible to compare an exact time series of surveyed data (as a small number of funds may drop in or out of scope). The analysis in this report only highlights broad systemic conclusions and does not identify or comment on individual firms or funds.

Internationally, we continue to work with other national regulators to promote the collection of comparable hedge fund data. In particular, we continue to engage with the Alternative Investment Fund Managers’ Directive (AIFMD), which will require regular reporting obligations for all alternative investment fund management sectors, including hedge funds. We are also working closely with the International Organization of Securities Commissions (IOSCO) and other national regulators to ensure that we can more clearly identify global risks through a consistent and proportionate international approach to systemic risk data collection for hedge funds. We will participate in IOSCO’s second global Hedge Fund Survey, which will be conducted in September 2012 to assess the potential channels through which financial stability risk could be transmitted.
The Hedge Fund Survey (HFS)

The HFS was introduced in October 2009 to complement the HFACS. It is now in its sixth iteration. It asks selected FSA-authorised investment managers about the hedge fund assets they manage and the qualifying funds for which they undertake management activities. The survey was designed to assess both the ‘market’ and ‘credit’ channels through which financial stability risk could be transmitted. Data is therefore collected on hedge funds’ exposures and footprint, use of leverage (through borrowing or derivatives), credit counterparty exposures, and the scale of any asset liability mismatch. A revised question on rehypothecation was also included in this survey period.

Approximately 50 FSA-authorised investment managers, covering over 100 qualifying funds, participated in the March 2012 survey. These funds reported total hedge fund assets under management (AUM) of approximately US$380bn as at 30 March 2012. 86% of surveyed funds are domiciled in traditional offshore centres, such as the Cayman Islands, Bermuda, the Bahamas and the British Virgin Islands, and most describe their regional strategies as ‘global’ in nature. The HFS covers a wide array of investment strategies. The largest strategy types by qualifying funds’ AUM or net asset value (NAV) were multi-strategy (28%), global macro (19%) and managed futures (19%). This is consistent with previous survey periods.

The Hedge Fund as Counterparty Survey (HFACS)

The HFACS started in 2005 and is in its fifteenth iteration. It covers 14 large FSA-authorised banks and branches that have significant dealings with hedge funds either through prime brokerage and/or through businesses generating counterparty credit exposures. These include UK, US, European and other global banking groups. The HFACS analyses potential risks to financial stability emanating from the ‘credit’ channel. It involves prime brokerage, credit exposure and product exposure analysis. Specifically, it collates data on the size, channel and nature of the larger credit counterparty risks that individual banks have to hedge funds, both individually and in aggregate. The HFACS asks banks to provide their aggregate and top 20 credit exposures (pre-collateral and potential) to hedge funds as counterparties. It therefore provides only a partial view, as not all of the data collected covers global exposures to the hedge fund industry, and not all counterparties to hedge funds are surveyed.

---

2 This includes FSA-authorised firms acting as sub-advisers in other jurisdictions.
3 Qualifying funds for the purpose of the HFS are hedge funds with a Net Asset Value (NAV) equal to or greater than US$500m.
4 Investment strategies include: Equity Long/Short, Convertible Bond Arbitrage, Credit Long/Short, Credit Distressed, Event Driven, Risk Arbitrage, Equity Market Neutral, Fixed-Income Arbitrage, Emerging Markets, Global Macro, Managed Futures, Multi-Strategy and Other.
Latest results

Performance and current conditions

In general, surveyed hedge funds reported improved conditions for the six-month period between October 2011 and March 2012. Net investment returns for qualifying funds averaged 5% (Chart 1), compared to -2% in the six months to end-September 2011. According to reported data, on average, funds performed particularly well in January and February 2012. The distribution of investment returns was favourable, with 82% of funds reporting positive returns in the current survey period; this contrasts with approximately 43% of funds in the period covered by the previous survey.

Chart 1

Fund Investment Returns
Histogram of total investment returns for the 6 months to end March 2012

Total assets under management increased in the survey period predominantly due to positive returns but also helped by generally positive net subscriptions (Chart 2). The asset weighted average change was 5%. Approximately 55% of surveyed funds reported positive net subscriptions for the six months to end-March 2012, with an asset weighted average across all funds of 1%. However, a minority of funds reported large negative net subscriptions in absolute terms, suggesting that for some funds redemption pressures have not eased.

Assets below their high-water mark (HWM)\(^5\) remained fairly stable in the six months to end-March 2012. Assets under special arrangements due to their illiquid nature, such as in side pockets\(^6\), have remained unchanged at 12% of aggregate NAV.

Source: FSA HFS

---

5 Where a hedge fund applies a high-water mark to an investor’s money, this means that the manager will receive performance fees on that particular pool of invested money when its net value exceeds the previous highest value achieved by the fund.

6 Side pockets are separate funds typically created to house illiquid assets. Investors receive a pro-rata share of the illiquid assets removed from the main fund and placed in the side pocket. Side pockets are used to manage illiquid assets that cannot be sold at the same pace as other assets in the main fund without incurring significant price discounts. Side pockets generally wind down over a much longer time period relative to the main share classes of funds.

---

Assessing the possible sources of systemic risk from hedge funds (August 2012)
Market footprint

A fund’s footprint is the total value of long and short positions held, ignoring the fact that many risks may be offsetting. Analysis of hedge funds’ footprints relative to the size of the global markets they trade in helps us understand the potential for stress within the hedge fund industry to be transmitted through the ‘market’ channel.

The HFS collects data on short market value (SMV) and long market value (LMV) for most asset classes in which hedge funds invest. However, it does not capture SMV and LMV for derivatives such as foreign exchange, interest rate, commodity and other derivatives; rather it asks funds to report gross notional values. The nature of these instruments means that their notional values are very significant and hence difficult to compare with instruments for other asset classes.

In aggregate, surveyed hedge funds have sizable long and short exposures in listed equities, G10 bonds of one year or greater tenor, and credit default swaps (CDS) (Chart 3). For listed equities, hedge funds’ exposures (i.e. long and short positions) are predominantly in US markets (55%). Approximately 51% of gross CDS is on indices, 31% is single name CDS (comprising 8% on single name sovereigns and 23% on financial and corporates), and the rest is in exotic positions such as credit default tranches. In the September 2011 survey, single name CDS represented 41%; there has therefore been a slight decline in its share of gross CDS between survey periods. In terms of derivatives, gross exposures are particularly large in interest rate derivative markets.
Gross exposures have increased notably over survey periods for G10 bonds of one year or greater tenor, structured/securitised products and ‘other’ products (which include investments in other external funds, investments in other asset classes, and investments in funds for cash management purposes) (Chart 4).
Net exposure is equal to long exposures less short exposures. It provides an indication of the direction of hedge fund investments, as sharp changes are a possible indicator of changes in manager sentiment and/or the conditions they face. One of the features that differentiates hedge funds from other parts of the asset management industry is their tendency to use offsetting long and short positions. In the six months to end-March 2012, net exposure was generally low and positive for most asset classes (Chart 5).

A notable exception is the sizable net long positions built up in G10 bonds with a one year or greater tenor. Furthermore, net long exposure in listed equities was US$75bn in the March 2012 survey; this is similar to a year ago as seen in Chart 5. It is worth noting that net long exposure of listed equities fell in the six months between March 2011 and September 2011 to US$23bn. The return to higher net long exposure in the current survey may be a reflection of rising markets at the start of 2012, as central bank stimulus provided a certain amount of increased confidence. Surveyed hedge funds also reported a small ‘net short’ CDS exposure in aggregate, indicating that they have been net buyers of CDS protection. The median fund captured in the HFS has a net long exposure of about 35% and this has been fairly constant across different surveys.7

7 This measure excludes selected derivatives, that is, foreign exchange, interest rate derivatives and commodity derivatives.
Of particular importance is the relative size of hedge funds’ exposures to the size of the global markets in which they trade. There are few asset classes where our sample’s aggregate footprint was greater than 2% of total market size (Chart 6). Exceptions are the convertible bond, interest rate derivative and commodity derivative markets. It is estimated that surveyed hedge funds hold approximately 7.3% of the outstanding value of the global convertible bond market. For the more systemically important interest rate derivative market, surveyed hedge funds represent 2.7%, although this share has declined between survey periods.

Source: FSA HFS
### Chart 6

**Exposure Relative to Market Size**

<table>
<thead>
<tr>
<th>Hedge fund gross exposure as a % of market size; derivatives measured based on notional value</th>
<th>Apr 10 Survey</th>
<th>Mar 11 Survey</th>
<th>Mar 12 Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed equities</td>
<td>0.6%</td>
<td>0.7%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Corporate bonds</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>G10 bonds 0-1 yr</td>
<td>0.6%</td>
<td>0.7%</td>
<td>0.9%</td>
</tr>
<tr>
<td>G10 bonds 1+ yr</td>
<td>1.0%</td>
<td>1.6%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Non-G10 sovereign bonds</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Financial institution bonds</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Convertible bonds</td>
<td><strong>8.1%</strong></td>
<td><strong>7.0%</strong></td>
<td><strong>7.3%</strong></td>
</tr>
<tr>
<td>Structured/securitised products</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Credit derivatives</td>
<td>1.0%</td>
<td>1.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Foreign exchange</td>
<td>2.4%</td>
<td>1.2%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Interest rate derivatives</td>
<td><strong>4.7%</strong></td>
<td><strong>3.5%</strong></td>
<td><strong>2.7%</strong></td>
</tr>
<tr>
<td>Commodity derivatives</td>
<td><strong>4.8%</strong></td>
<td><strong>5.8%</strong></td>
<td><strong>6.0%</strong></td>
</tr>
</tbody>
</table>

It is also important to consider the size of hedge funds’ footprints relative to their contribution to market liquidity and trade volumes. For the six months to end-March 2012, turnover is highest for foreign exchange, listed equities, G10 bonds with a one year or greater tenor and commodity derivatives. Chart 7 shows that for other asset classes, turnover has remained fairly stable and low between survey periods. A survey limitation is that we do not collect data by contract amount; it is therefore difficult to fully understand surveyed funds’ turnover relative to that of the global market.
It is important to assess the amount and sources of hedge fund borrowing because of the potential impact on financial stability through ‘market’ and ‘credit’ channels. The HFS asks surveyed funds for data on the different methods through which they can gain leverage. This includes collateralised borrowing under prime brokerage agreements, repurchase agreements (repo), and using synthetic instruments such as total return swaps (TRS) or contracts for difference (CFD).

The latest results show that hedge funds continued to rely heavily on borrowing via repo in aggregate, with 47% coming from this source\(^8\) (Chart 8). This represents a decline from 57% recorded in the September 2011 survey, with hedge funds increasing their borrowing via prime brokerage as well as their synthetic borrowing. The proportion of borrowing on an unsecured basis continued to be negligible. Data from the April 2012 HFACS shows that a high portion of repo financing between surveyed banks and their hedge fund counterparties comprised G10 government bonds as collateral. This has remained relatively unchanged across recent HFACS.

---

\(^8\) For this form of borrowing, hedge funds generally repo out an asset (collateral) in exchange for cash finance for a set period of time. In normal market conditions, at the end of the term hedge funds often elect to roll the repo, rather than repay the loan.
If the provision of finance is withdrawn rapidly, hedge funds may be forced to liquidate their portfolios quickly. This may in turn result in a disorderly fire sale of assets. While hedge funds have a small footprint in most markets, forced selling could still affect market liquidity and efficient pricing if it occurs during periods of heightened market stress or where hedge funds make up a significant proportion of market liquidity. Repo borrowing may be a particular risk as it has to be continually rolled, and this may be difficult for hedge funds to achieve during stressed market conditions.

Leverage can influence other risks such as liquidity risk and market risk. There are many methods to measure the extent of leverage, each of which has its advantages and disadvantages. The HFS uses two methods. The first method is to measure gross exposures as a multiple (or percent) of NAV (Chart 9). The gross exposure method has the advantage of including leverage obtained through all sources, including derivatives. However, it also has disadvantages, namely measurement issues for some derivatives and because it does not account for netting, hedging and offsetting arrangements that may serve to reduce exposures.

In general, funds with ‘spread-based’ strategies (such as fixed-income arbitrage) can be expected to have a greater ratio of gross exposures to investor equity compared to those with ‘fundamentals-based’ strategies (such as equity long-short), which are relatively more directional. This is reflected in the latest HFS results (Chart 9). Results also show that for this measure, aggregate leverage has remained stable across survey periods at about 3.8 times NAV. Most strategies have seen little change

---

9 Interest rate derivatives have large notional values from which interest payments are calculated. As the notional amount generally does not ‘change hands’ (only the interest payments), looking at solely the large notional value of interest rate derivatives can overstate risks.
in aggregate; a notable exception is fixed-income arbitrage strategies. Leverage for this strategy type is highest among the hedge fund strategies. It decreased from 14 times NAV in the April 2010 survey to 10 times NAV in the March 2011 survey, and was reported at 12 times NAV in the latest survey. Furthermore, multi-strategy type funds have seen an overall increase in their gross leverage in the twelve months to March 2012. Gross exposures of credit long/short strategies have declined relative to their NAV.

**Chart 9**

*Aggregate Fund Leverage: Gross Exposure as a multiple of NAV*

Excludes interest rate derivatives, commodity derivatives and FX

A second measure of leverage obtained from the HFS is total borrowings expressed as a multiple (or percent) of NAV. The borrowing measure is useful in informing us about hedge funds’ interconnections with banks and prime brokers, which is a key channel through which systemic risks may propagate. However, it does not capture all forms of synthetic borrowing (predominately those from TRS and CFDs). This measure paints a similar picture: leverage remained fairly constant between survey periods and fixed-income arbitrage type strategies reported the highest borrowings relative to NAV (Chart 10). However, aggregate leverage is lower at 2.7 times NAV compared to that reported using the gross leverage measure.
We also analyse leverage and other survey measures on a fund-by-fund basis to identify outliers that may be of systemic importance individually. Leverage for the median fund has not changed significantly over survey periods and is around 2.2 based on gross exposure leverage and 1.3 based on the borrowing measure of leverage.

The HFS collects data on the level of unencumbered cash held by funds. This influences a fund’s ability to meet margin calls and fund redemption requests without having to raise capital from other investors, find alternative sources of finance or sell assets. The amount of unencumbered cash put aside will vary not just with the amount of leverage used in a strategy but also with the liquidity and volatility of the markets in which a hedge fund trades. The median fund reported unencumbered cash that is 58% of its borrowings; this has fluctuated over the years between the 50% and 85% mark. Unencumbered cash relative to gross exposure saw a general decline for the median fund between the October 2009 and March 2011 surveys. This increased for the six months to September 2011 but declined again over the latest survey period to 4% (Chart 11).
An important focus of the HFS is to examine the scale of any asset/liability mismatch among hedge funds and the degree to which funds may routinely engage in maturity and liquidity transformation. Participants were asked to report, in relation to the larger funds they managed, the liquidity of the investments made compared with the liquidity of liabilities to investors and finance providers. We recognise that this data is often subjective, as managers’ responses are likely to be based on recent expectations and experience of market liquidity. Also, assessments of term financing may not consider break-clauses and other methods that finance providers could use to change their terms. Conditions may also be attached to term financing agreements that would be triggered in stressed market environments, resulting in a sudden withdrawal of funding. As a consequence, in stressed market environments, portfolio liquidity may deteriorate significantly more than reported while financing and investor liquidity may increase.

Nonetheless, data suggests that as at 30 March 2012, the assets of surveyed hedge funds could be liquidated in a shorter timeframe than the period after which their liabilities (to investors and finance providers) would fall due. For example, surveyed

---

**Maturity transformation**

Participants were asked to calculate portfolio liquidity based upon average 90-day trading volumes and on the basis of trading a maximum of 25% of this amount in a single day. For less liquid positions, participants were asked to use best estimates for liquidity based on market conditions over the last six months and assuming no fire-sale discounting. Investor liquidity was calculated in a worst-case scenario, where gates were enforced, although funds not suspended.

---

10 Participants were asked to calculate portfolio liquidity based upon average 90-day trading volumes and on the basis of trading a maximum of 25% of this amount in a single day. For less liquid positions, participants were asked to use best estimates for liquidity based on market conditions over the last six months and assuming no fire-sale discounting. Investor liquidity was calculated in a worst-case scenario, where gates were enforced, although funds not suspended.

---

16 Assessing the possible sources of systemic risk from hedge funds (August 2012)
funds report that about 60% of their aggregate portfolios could be liquidated in less than five days, compared to 20% for their fund liabilities due over the same period (Chart 12).

**Chart 12**

**Average Liquidity Profile**

Estimated average portfolio and liability liquidity profile, March 2012

<table>
<thead>
<tr>
<th>Number of Days</th>
<th>% of Portfolio</th>
<th>Source: FSA HFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5 days</td>
<td>100%</td>
<td>Difference</td>
</tr>
<tr>
<td>6 days – 15 days</td>
<td>90%</td>
<td>Ave Portfolio Liquidity</td>
</tr>
<tr>
<td>16 days – 30 days</td>
<td>80%</td>
<td>Ave Liability Liquidity</td>
</tr>
<tr>
<td>31 days – 90 days</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>91 days – 180 days</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>181 days – 1 year</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>1 year +</td>
<td>40%</td>
<td></td>
</tr>
</tbody>
</table>

Hedge funds often have the ability to suspend redemptions, restrict redemptions to a specific percentage of the hedge fund’s NAV (e.g. a ‘gate’) and/or restrict investors from redeeming their interest in certain investments (e.g. ‘side pockets’). The probability of a hedge fund suspending redemptions, invoking a gate or putting certain investments into a side pocket is likely to increase during stressed market periods that cause investors to withdraw funding. Data from the HFS suggests that 88% of funds have the ability to suspend investor redemptions and/or create side pockets. This is in line with previous survey results. Furthermore, 60% of surveyed funds have investors who have side letters that give them different terms to those set out in the funds’ offering memorandums.

The source of investors also suggests potential channels through which distress in hedge funds could spread to other parts of the finance industry and to the real economy. 77% of aggregate investor capital was intermediated through institutional investors\(^{12}\) as at 30 March 2012 (Chart 13). Allocations by pension plans/funds increased significantly between March 2011 and March 2012, while the share of investment represented by high net worth individuals and family offices declined.

---

11 Total liabilities are estimated from the liquidity profile of investors and financing, weighted by proportion of funding NAV and from borrowings respectively.

12 For the purpose of this report, institutional investors include: state, municipal and other government entities and sovereign wealth funds; endowments/foundations and charitable organisations; pension plans/funds; banks, insurance companies and other financial institutions; and other investment funds (such as fund of funds).
Counterparty exposures

The HFS and HFACS allow us to examine the credit counterparty risks that exist between banks and hedge funds. This helps us understand the possible transmission mechanisms for systemic risk through the ‘credit’ channel.

The range of counterparties used by hedge funds since the financial crisis is said to have increased, such as in the use of multiple prime brokers. However, since the introduction of the HFS, results suggest that credit counterparty exposures of surveyed hedge funds remain fairly concentrated, with just five banks accounting for approximately 65% of aggregate hedge funds’ net credit counterparty exposures.

From the banks’ perspective, the size of their exposures to hedge funds are generally small relative to bank capital. The HFACS suggests that the average potential exposure of any one bank in this survey to any one hedge fund captured in the HFACS is less than US$50m (Chart 14). The range of reported potential exposures to single funds by single banks has remained broadly similar since the last survey.

---

13 It is important to note key differences between the HFS and HFACS. The HFS captures large hedge funds managed from the UK. The HFACS surveys investment banks and prime brokers with operations in the UK, and covers only their largest exposures to hedge funds globally (e.g. top 20 hedge fund exposures); some of these hedge funds are not managed from the UK and do not appear in the HFS. Nevertheless, the two surveys provide complementary data that is useful for examining general trends.
The average margin requirement of surveyed prime brokers in the HFACS has increased since the financial crisis (Chart 15), providing banks with greater protection from a hedge fund default.

Chart 15
Source: FSA HFACS

**Average Prime Brokerage Margin Requirements – Marginal Requirement/ LMV**

*Pre Lehman ave 29%*

*Post Lehman ave 37%*
Beyond required margin requirements, many hedge funds also post excess collateral, which is a further factor that may mitigate both individual counterparty and credit risks from hedge funds. The HFACS suggests that average excess collateral is currently around 95% of the base margin required (Chart 16). Excess collateral peaked in October 2008 but has since returned to the pre-crisis average. The aggregate dollar amount of excess collateral posted will also have increased post-crisis, as base margin requirements have increased on average (see Chart 15) while the ratio of excess collateral to base margin requirements has remained stable.

**Chart 16**

**Average Excess Collateral Held by Prime Brokers – Collateral as a % of Base Margin**

Another element of credit counterparty risk is the rehypothecation of hedge fund assets by prime brokers. Rehypothecation allows collateral posted by a hedge fund to be transferred to its broker, to be used again as collateral by that broker for its own funding. The rehypothecation of assets constitutes a counterparty risk for hedge funds to manage and also potential funding risk for banks/brokers if these assets were to be withdrawn suddenly. We included a question on the value of assets rehypothecated by counterparties to hedge funds for the first time in the September 2011 HFS. This survey question was revised in the current round with the aim of obtaining more accurate data.

Results for the March 2012 survey state that 89% of surveyed funds have legal agreements with a brokerage counterparty that permits rehypothecation, title transfer or other similar arrangements for transferring ownership of collateral posted or assets placed in custody. On average, these funds permit rehypothecation up to 119% of net indebtedness. A quarter of the funds that allow for rehypothecation (or other similar arrangements) report that they do not know the precise value of their rehypothecated assets and a further quarter report zero rehypothecated assets. We

14 ‘Excess collateral’ is defined as the net equity held in a prime brokerage account, in excess of the margin requirement.
will continue to monitor trends in the value of rehypothecated assets and look to improve data collected on this topic.

**Portfolio concentration**

As part of our analysis, we also assess operational and portfolio measures, in particular, looking for outliers and changes over time. For example, we measure each qualifying fund’s top ten positions as a percentage of their total gross market value (GMV). This measure of portfolio concentration has remained fairly constant for the median fund over the years, stagnating between 23% and 33%. The top 75th percentile of funds (by portfolio concentration) report that the largest ten positions account for approximately 50% of GMV (Chart 17).

**Chart 17**

**Top 10 Positions as a % of GMV**

![Chart 17](source: FSA HFS)

Chart 18 shows the total number of open positions reported by different strategy types as at 30 March 2012. On average, the number of open positions is highest for ‘multi-strategy’, ‘fixed-income arbitrage’ and ‘global macro’ type funds. This is consistent with previous survey periods. It is lowest for ‘credit distressed’ and ‘managed futures’ type funds. This may reflect the relative liquidity of the instruments and markets where these strategies typically invest. The number of open positions has remained fairly stable for the median fund over the past six surveys.
**Conclusion**

Results from the March 2012 HFS suggest that risks to financial stability through the ‘market’ channel are limited at the time of the latest survey. The aggregate footprint of surveyed funds remains modest in most markets and leverage is largely unchanged for most funds. Most cash (or on-balance sheet) leverage comes from repo borrowing, which must be continually rolled. Funds continue to report a strong ability to manage the liquidity of their assets and liabilities in aggregate. However, reports are based on self-assessment and it is difficult to gauge whether these measures would hold during stressed market periods. Risks to hedge funds remain from a sudden withdrawal of funding (such as financing from prime brokers and margin calls on derivatives trading), resulting in forced asset sales. This is of particular concern if funds have significant footprints.

Results from the April 2012 HFACS indicate that counterparties have increased margining requirements and tightened other conditions on their exposures to hedge funds since the financial crisis. This suggests an increase in banks’ resilience to hedge fund defaults. However, if a sudden withdrawal of funding was to occur in one highly leveraged fund or across a number of funds, this may result in forced asset sales that exacerbate pressure on market liquidity and efficient pricing.