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**Address by Gareth Murphy Director of Markets Supervision,
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Hedge Fund Regulation

I would like to thank Mark Berman and InvestoRegulation for the invitation to give the keynote speech this morning.

It is good to be back in London where I have spent most of my career and I am delighted to have the opportunity to discuss the issue of hedge fund (HF) regulation.

My thoughts, this morning stem from my experiences working in the hedge fund sector, investment banking and central banking and regulation.

Some of the language I use may seem strange to the non-economists in attendance but I hope to persuade you that we must think about the *raison d'être* for regulation using the insights of some famous economists like Akerlof, Stiglitz, Kahnemann and Tversky and others.

I will argue that the 'integratedness' of global financial markets and the current processes for developing financial regulations within regional blocs pose systemic risks for the future. And the lessons of the recent financial crisis should prompt us all to take a step back and consider how we develop financial regulation.



The genesis of regulation

- How regulation comes about
- How it should come about
- The Economics of Regulation

Argument for and against HF regulation

- What HFs do: economic purpose
- Incentive alignment: performance pay vs attrition
- Proprietary business model
- Monthly performance returns
- 'Crowded trades' and 'Seemingly diversified portfolios'
- Role of Prime Brokers
- Investor protection
- Systemic risk
- Being part of a complex financial network
- AIFMD and DF

Regulation in the future

- Focus on sources of market inefficiency
 - Take account of global spill-over effects
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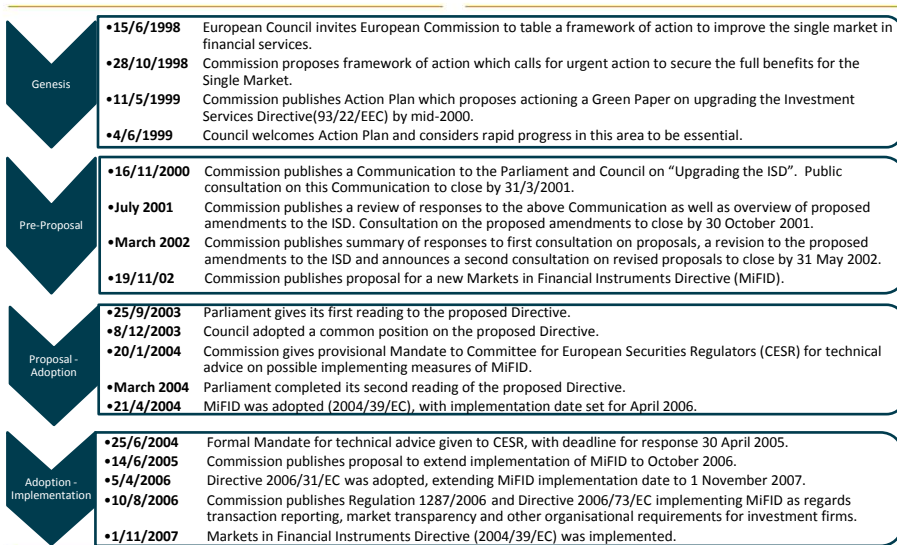
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I will spend the next 20 minutes (or so) looking at (i) how regulation comes about, (ii) regulation in the HF sector and (ii) conclude by looking at how best we might develop regulation in the future.

MiFID as an example of the Process for developing EU regulation



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As a starting point, let's consider how financial regulation is developed in Europe at present.

By way of an example, the above slide sketches the process by which the (first) MiFID was developed. There is logic to this process: starting with the high-level principles and progressively become more granular.

But like a busy kitchen, there are many chefs tossing in their favourite ingredients – politicians, civil servants, central bankers, regulators, industry lobby groups, investors, consumer groups, academics, journalists and the odd economist. However, the end-product can be sometimes difficult to digest especially when it is one of many such courses.

I will say more on this later.

- Perceived failures in markets leading to political and social pressure for (some sort of) change
- Creating a 'single market' for production and distribution of goods and services
- Creating a 'single rule book' for regulated markets
 - Removing scope for regulatory arbitrage
 - Removing 'barriers to entry'
 - Creating a 'level playing field'
- Correcting 'market inefficiencies' or 'market failure'

4

But let's take a step back from this and think about **how** regulation comes about.

Of the various drivers of regulation, four spring to mind (and are set out in the above slide)....

1. 'Something must be done'

We are all familiar with situations where a catastrophic or tragic event occurs, there is a public outcry, grinding and gnashing of teeth, political ructions and a hasty legislative change.

One real-life example which springs to mind is the *Dangerous Dogs Act of 1991* when dog muzzles were introduced for a range of species following a spate of incidents (in this country) where young children were attacked. Tragic though these events were, the legislation has been criticised for being **conceived in haste in reaction to a public outcry** and (and not allowing for the physiology of some dog species).

2. 'Towards a single market'

Closer to home, the creation of the European Coal and Steel Community in the 1950s was the precursor to a lengthy process to create a single

market for production and distribution of goods and services in Europe culminating the Maastricht Treaty in 1992.¹ Legislation and regulations in this instance were motivated by a desire to foster peace through economic integration and **build an economic bloc** which would grow through increased cross-border trade and the **creation of a single continental market place**.

3. 'Towards a single rule-book'

In the face of the emerging single market, individual countries have struggled to resist the impulse to use their respective regulatory regimes to protect local interests. In European financial services, this has led to the need to develop a 'single rule book' to promote consistency, reduce barriers to entry and eliminate opportunities for regulatory arbitrage.²

My point in mentioning these first three regulatory drivers is that, whilst they may have merit *in their own right* and *in their own time*, in a globally integrated marketplace we can no longer ignore their unintended consequences by leaving spill-over effects to be swept under the carpet. As an aside, Stiglitz (2010) notes that while the integration of financial markets – whether at a European or global level – was expected to bring greater financial stability, there are reasons to believe that autarky (in this sense of each country for its own) may be more financially stable. This is a strong and provocative conclusion and food for thought which I will come back to later.

4. This leads me to the fourth driver for regulation – which I will argue has attained greater importance as a result of the financial crisis – this is the need to tackle the sources of what economists term 'market inefficiencies' or 'market failure'. The financial crisis has shown that the consequences of market failure can be extreme costly and they can last for generations, so financial authorities and market participants have a specific responsibility to think about the ways in which financial markets

¹ See http://europa.eu/about-eu/eu-history/index_en.htm

² The World Trade Organisation has sought to remove these barriers in a global setting.

do not perform efficiently. The underlying sources of market inefficiency have been well-studied since the 1970s.



Looking at financial markets, there are four key economic frictions which give rise to 'market inefficiencies' which may justify regulatory intervention:

1. Principal-agent problems
2. Incentive Misalignment
3. Information Asymmetry
4. Agent Behaviour

See Laffont (1994), Llewellyn (1999), Cumming and Johan (2008)

5

In economics, we use the word 'friction' to describe a phenomenon which creates market inefficiency or contributes to a market failure. As a regulator, the four main frictions which I encounter most often are³:

1. Principal-Agent problems:

These occur where there is a principal who delegates responsibility to an agent to act on his/her behalf, for example, shareholders expect a CEO to maximise the share price not so siphon off profits into executive expense accounts.

2. Incentive misalignment problems:

These occur where different people in the same financial arena are motivated by different incentives. My favourite example from my past-life is the tension between traders who manage risk and salespeople who get paid for getting traders to show good prices to clients. If a trade goes

³ There are other frictions which I will not dwell on here such as: transactions costs and taxes, barriers to entry, property rights and legal claims.

wrong it is invariably the trader's problem for showing an 'overly-competitive' price, not the salesperson who has pocketed his commission.

3. Information asymmetry issues:

This is one of the best studied frictions in financial markets. Akerlof's paper on 'The Market for Lemons' highlighted how markets for used cars can become dysfunctional when you cannot tell a quality car from a dodgy car - or 'lemon' - the famous result being that in such circumstances only the 'lemons' trade.

4. Agent behaviour issues

This fourth friction deals with our cognitive response to complex situations, put simply, how do we process information and how do we deal with uncertainty⁴? There is currently a burgeoning literature of 'behavioural finance' looking at the many phenomena which exemplify this friction at work. You will be familiar with some of the issues here such as:

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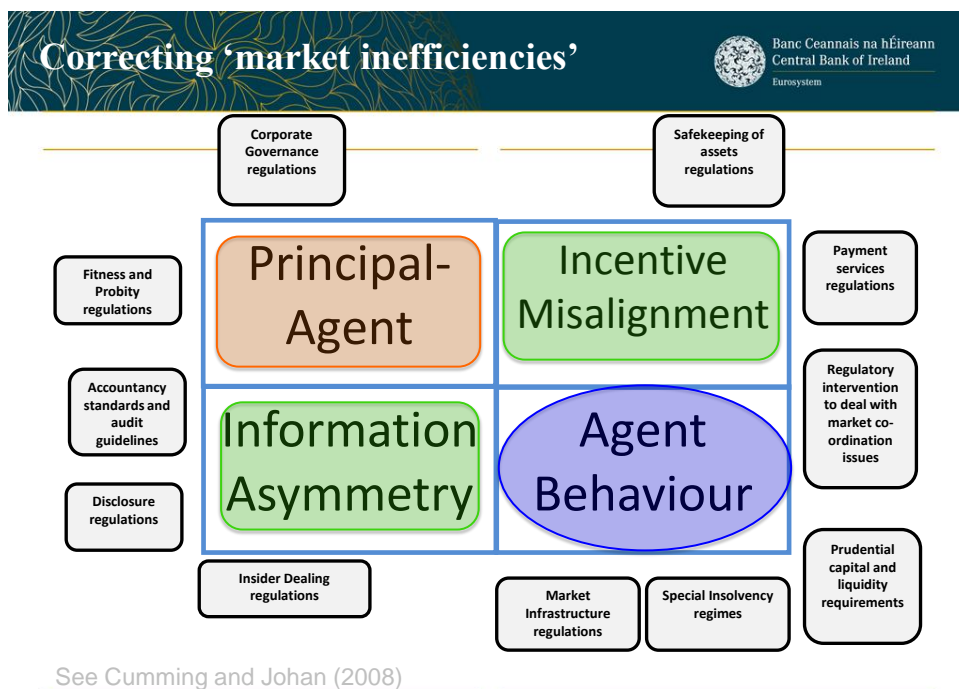
- the Prisoners' Dilemma which is the famous Nash game which considers whether you should betray your accomplice and gamble that he will not betray you knowing that he will be considering just the same;
- traders' loss aversion where winning trades are cashed in and losing positions are let run (and possibly fester);
- consumers' inconsistent approach time: "if you would prefer \$90 now to \$100 in a year's time does that mean that you would prefer \$90 in nine year's time to \$100 in 10 years time?".

⁴ See Lo and Mueller (2010) for a taxonomy of uncertainty.

⁵ See for example, Kahnemann and Tversky (1979), Laibson (1992), de Bondt and Thaler (1985), Harford (2011)

- Lastly, it is worth mentioning that legal uncertainty can be a significant source of market inefficiency.⁶

The bail-out of Long-Term Capital Management (LTCM) is a useful example to view through the prism of economic frictions. LTCM had lots of trades which other banks had mimicked, the market could not establish the size of the positions, during the Summer of 1998 investment banks' self-interest lead them to try and liquidating their positions thereby driving the marks wider, thereby generating larger losses for the fund and for the banks. Finally the Federal Reserve Bank of New York (FRBNY) stepped in, brought all the key banks with exposures to the fund together, realigned incentives by asking each bank to provide capital to the fund (thereby diluting the partners) and dealt with the principal-agency problem by appointing a six-person management team representing the banks.



6

⁶ For example, the introduction of limited liability and the creation of certain types of bankruptcy regime.

This slide maps the various familiar types of regulatory intervention with the four economic frictions. Without discussing all the regulatory interventions noted here, I will note two.

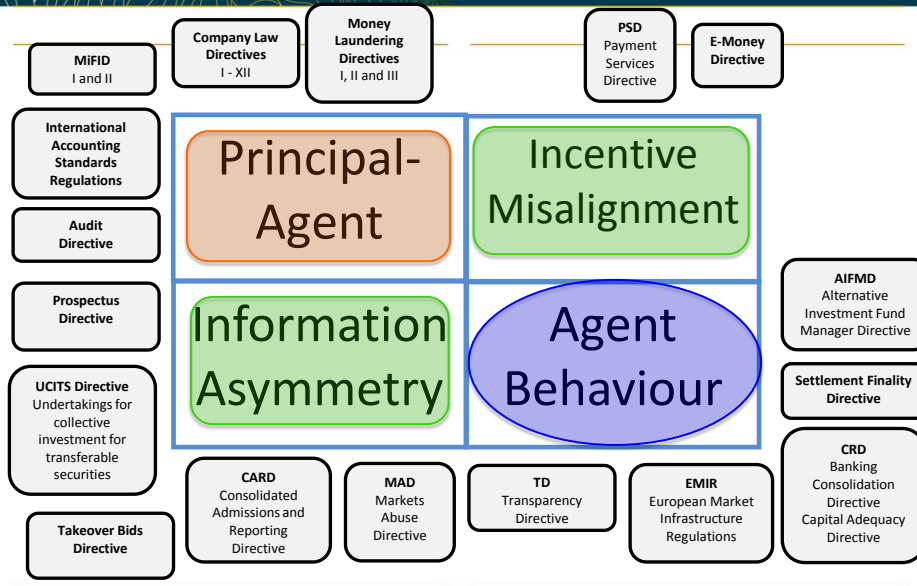
Principal-agent problems are tackled through corporate governance standards and fitness and probity assessments. Much has been written⁷ and much work has been done to strengthen corporate governance⁸ and to require that persons occupying controlled functions meet fitness and probity standards.⁹

Many of the above economic frictions have been at the heart of the crisis in the banking industry but the one I would highlight is the herd-like behavioural weaknesses which lulled banks to underestimate liquidity and solvency risks through weak origination standards and excessive maturity transformation. The upshot of this is the Basel III protocol – and the fourth iteration of the EU Capital Requirements Directive (CRD IV).

⁷ Such as Cadbury (1992), Rutteman (1994), Greenbury (1995), Hampel (1998), Turnbull (1999) and Higgs (2003) in the UK.

⁸ Notably the US Sarbanes Oxley Act of 2002 and various directives to strengthen the role of the audit function in the EU: EC 1996 Green Paper (COM 1996/321) on “The Role, Position and Liability of Statutory Auditor in the EU” and ‘the 8th Directive’ 84/253/EC.

⁹ The Central Bank of Ireland has recently introduced a statutory corporate governance code for banks and insurers, assisted the funds industry in the development of its own voluntary code and introduced Fitness and Probity regulations across all regulated financial entities.



7

From a European perspective, I have (in this slide) sought to align the different financial markets directives with the various frictions. As we can see (from this non-exhaustive list), there are many directives (some of which have gone through multiple revisions and iterations.)¹⁰

When thinking about the corpus of financial regulations in an increasingly integrated global financial market place, it seems to me that in order not to be overwhelmed by the tsunami of directives, regulations, technical standards and guidance, we need to fix our frame of reference on the underlying reasons for regulating, that is, the economic frictions which are the sources of market inefficiency.

¹⁰ I would note in this regard, that the EC is looking to create a harmonised and consistent framework for funds, therefore, as UCITS evolves, one should monitor the read-across for AIFMD, and vice versa.

- HFs expand the opportunity set of investors – improving market completeness and diversification
- HFs are part the market information network – without HFs, price formation would be much slower and less efficient (in the statistical sense)
- HFs often express contrarian views providing liquidity and challenging 'conventional wisdom'
- Many HFs can express views over longer investment horizons (tends to be the bigger HFs or ones with lock-ups or stable strategic investors)

8

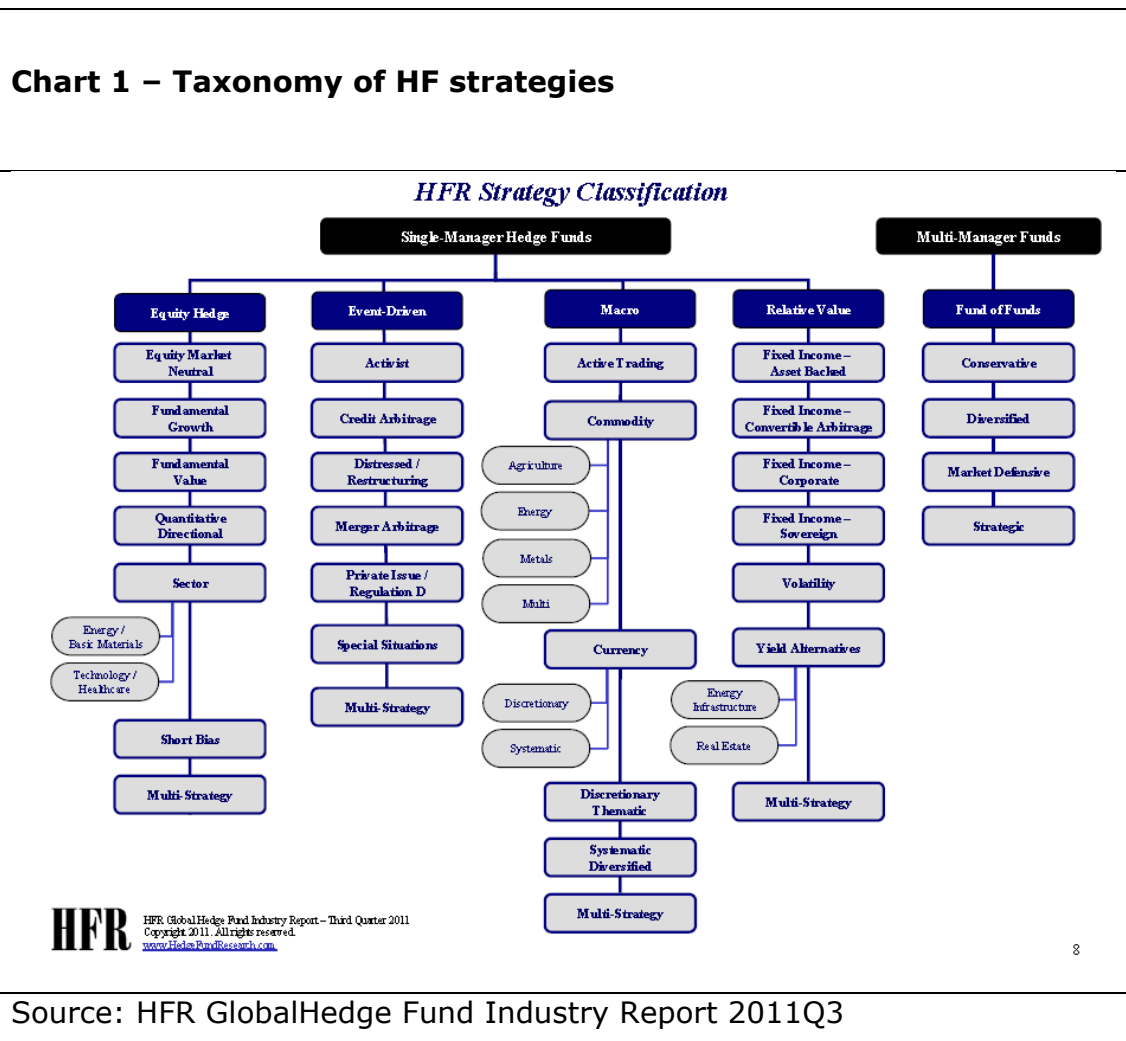
As this is a conference about HF regulation, let me be a little bit more concrete. But first, let's consider the economic function of the HF sector. In this regard, four particular functions come to mind:

1. HFs increase the set of investment opportunities which investors may access. This is evidenced by the wide array of HF strategies being implemented at present. Looking at a recent HFR Global Review (see chart 2), I count 28 different types of single-manager strategy. In the economics literature, we say that this makes markets more complete. This allows asset managers to be more diversified¹¹. This is exemplified by the emerging growth of tail-funds which offer investors the opportunity to hedge serious financial crises.
2. The HF sector plays a valuable role as part of the market information network where prices adjust to market news - without HFs, I believe that prices would take longer to adjust.

¹¹ Economists would say that HFs make market more 'complete'.

3. By virtue of the incentive and lock-up arrangements, many HF can take contrarian views which challenge conventionally held market ideas and inefficient herd behaviour.

4. HF can provide liquidity to the banking and insurance sectors and can be a very useful sounding board for pricing risk.¹²



¹² For example, HF can play a valuable role when it comes to pricing structured or out-sized retail and corporate transactions. That said, whilst HF do provide liquidity to the investment banks, they have limited capacity and such trades can become crowded if the underlying flow, eg retail, continues unabated, a good example being the demand for guaranteed tracker bonds during the bull market of the late 1990s.

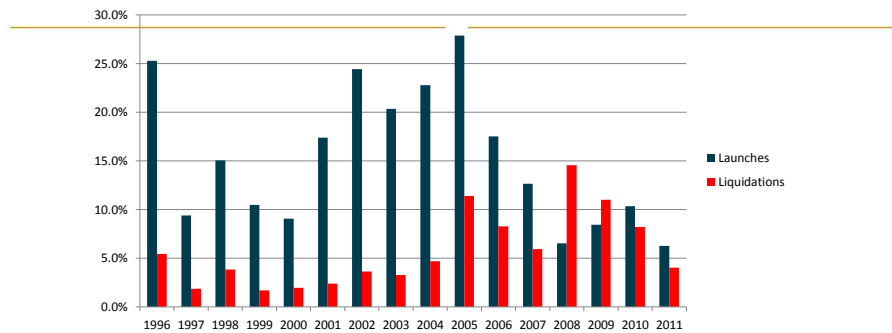
- HF leverage has been low (though it does spike as a HF is in distress!)
- HF sector has better incentive alignment than banking industry
 - +ve performance is rewarded
 - -ve performance leads to investor redemptions and possibly fund closure
 - investors demand that HF principals have 'skin in the game'
- Hedge fund sector as a Darwinian habitat:
 - There are probably too many HFs in aggregate (and index-tracking may be more efficient)
 - But there is considerable performance diversity and
 - Significant attrition amongst weak performers
- No tax dollar ever spent bailing out a HF

9

In presenting the case that the HF sector does not need to be regulated, many commentators would advance the following arguments:

1. that no tax dollar has been spent bailing out a hedge fund
2. that HF leverage has generally been lower than that of broker/dealers, investment banks and even commercial banks and there are studies to back up these claims, see for example Ang, Gorovyy and van Inwegen (2011)
3. that the incentives in the HF sector are better aligned than in banking for the following reasons:
 - i) HF managers get paid for positive performance and for assets under management,
 - ii) Poor performance leads to redemptions
 - iii) Substantial redemptions lead to fund closures
 - iv) Investors demand that HF principals have 'skin in the game' by requiring that they are co-invested in their own funds

Taking stock on the Hedge Fund sector – HF attrition



- HF attrition is significant, see Xu et al (2011), and have averaged 6% since 1996 and have peaked at almost 15% in 2008.
- Apart from the financial crisis, the number of HFs continues to grow
- At the same time the big HFs are getting bigger

Source: HFR Annual Report 2011

10

Thinking further about incentive alignment:

4. The HF habitat - to use the language of Darwin - is one characterised by high attrition rates (see Xu et al (2011) where weak performers face extinction. This is evidenced in the above chart which shows how new HFs have come and gone over the last decade. Based on HFR data, HF attrition has run at 6% on average over the last 15 years and peaked at 15% in 2008.¹³

¹³ Whilst the market may do a good job in ensuring incentive alignments, especially for the medium and small HFs, it is worth keeping this under review to the supersized HF managers with tens of billions under management. Over time, whereas a billion dollar HF would have been a monster in 1990s, it is tiddler relative to the \$30-50bn behemoths of 2012.

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- Risk management is well understood and there are numerous third party vendors
 - Prime brokers are a powerful first line of oversight... but their actions can have systemic effects
 - But HFs strategies lose diversification properties as Prime Brokers raise haircuts and force fire-sales

11

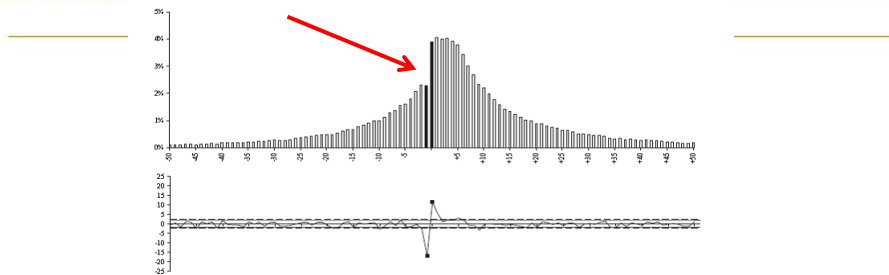
Other arguments advanced against greater HF regulation include:

5. the fact that risk management culture and discipline within HFs is generally strong, the measurement and monitoring of risk is seen to be an area of comparative advantage and there are numerous vendors of off-the-shelf risk management suites which obviate the need for substantial up-front in-house development.

6. acting in their own self-interest, prime brokers do play a quasi-prudential role in ensuring that weak or distressed HFs are not allowed to impose credit losses on their counterparts.¹⁴

These arguments do have merit in their own right.

¹⁴ That said, when prime brokers raise haircuts in a systematic fashion across one or more lines of business, this can have systemic consequences resulting in fire-sales and trading strategies becoming more correlated from a mark-to-market point of view.



- The essence of the business model is proprietary trading strategies so full transparency is impossible and probably undesirable (as likely to create more crowded trades)
- So investors buy reputation and track record – but Madoff highlighted how this can be abused
- But there are incentives to smooth performance, eg Bollen and Pool (2009), Cumming and Dai (2010), so independent administrators play a valuable role

Source: Bollen and Pool (2009), Journal of Finance

12

But they are not the whole story. The economic frictions I outlined earlier explain why.

First, let's think about the issue of information asymmetry.

1. HF investment strategies are proprietary by nature. Investors will have very limited knowledge of trading strategies. This means that HF returns and track records are especially important. Owing to the risk of redemptions, HF managers seek to avoid 'down months' and this has been noted in the empirical work of Bollen and Pool (2009) and Cumming and Dai (2010)¹⁵.

2. The diversification benefits, referred to earlier, have encouraged the interest of a wider and less sophisticated array of investors. As a result, investor protection is a greater concern as the impact of a failing HF is likely to extend beyond that of high-net worth individuals to pension funds, insurance and other long-term investment portfolios.

¹⁵ Where there is a discontinuity in the $[-0.5\%, 0]$ range of the cross-sectional returns distribution (see graph reprinted from Bollen and Pool (2010)).

In sum, investors need the protection of an independent administration function to ensure the integrity of monthly performance returns.



- Many HFs in the past had a weak negotiating position with PBs in relation to asset and collateral management terms ...
- ... and some simply did not do the necessary due diligence ...
- ... Lehman Brothers International Europe (LBIE) failure was a disaster for HFs and UK prime brokers as unencumbered client assets were caught up in the general creditor estate
- Lead to UK Special Administration Regime (SAR) – KPMG currently administering MF Global (UK) under UK SAR
- Need for similar regimes in other European countries to deal with the failure of MiFID authorised firms
- Ireland introducing this in 2012

13

Investor co-ordination problems and legal uncertainties

1. Whilst investors may have to live with a veil of secrecy about the details of trading strategies, Lehman's bankruptcy has shown that they must understand what I call 'the plumbing of the HF'. Due diligence must be conducted on the interactions between the prime broker, custodian and administrators.

2. In the past, many HFs have not prioritised attention to these 'plumbing matters' relative to performance management and capital-raising (or perhaps because of these issues). Having consulted with the HF industry in the past, many HFs did not have much leverage over the prime brokers when it came to negotiating terms around custodial and rehypothecation arrangements. (I recall how in late 2008, some HFs were severely punished by investors for not being able to answer key questions about how their assets were being held at the UK subsidiaries of US prime

brokers. Concern about the insolvency regime created strong incentives for HFs to move prime brokers.)

3. In the wake of Lehman's failure – where HF assets were caught up in the general creditor estate of Lehman Brother's UK subsidiary – prime brokers have sought to create different solutions to the problem of a failure of a UK incorporated prime broker, eg tri-party custodial arrangements, bankruptcy remote custody vehicles and the like. But many of these can only be tested when a firm fails. The lack of certainty regarding the right solution suggests that the state has a role to play in removing legal uncertainty.

The US SIPC trustee and the UK Special Administration Regime are all responses to the need to provide clarity to investors and firms in the event of the failure of an investment firm. The Irish authorities are currently working on introducing special administration powers for investment firms and there is a need for similar regimes in other European countries.



- HF do provide liquidity to investment banks – but they have limited capacity and that can lead to 'crowded trades'
- Some HFs can take outsized market positions, eg LTCM, Amaranth, leading to market turbulence
- Technology and market-fragmentation has allowed distant HFs to impact local economies from afar

Systemic behaviour

The events of LTCM and Amaranth have shown that individual HFs with substantial outsized positions can cause market turbulence which may undermine investor confidence. It is difficult to argue the case that such market volatility is economically beneficial. Indeed, regulatory authorities are concerned about situations where markets may become disorderly due to the impact and actions of a single player.

We have seen cases where HFs and investment banks can crowd the same trade. A real economy shock to the financial sector can have real economy consequences. For example, the GM and Ford credit downgrades to junk status in 2005 led to substantial dislocation in corporate credit markets.¹⁶

The wide range and dynamic nature of HF strategies poses significant challenges for regulatory authorities and their capacity to monitor markets and take decisive action.

¹⁶ <http://www.voxeu.org/index.php?q=node/2420>

- The financial system is substantially more complex, geographically diverse and (paradoxically) more integrated (or 'tightly coupled').
- Evolution of the shadow banking system and its role in primary and secondary capital and credit markets is the subject of considerable study and debate - FSB, IOSCO, ESRB etc
- Considerable recent work in this area, especially Gorton (2009), Gorton and Metrick (2010) and Poszar et al (2010)
- HFs are part of this large complex financial network and as regulators we can no longer afford to leave parts of that network 'uncharted' and not gather data or understand the inter-linkages

15

Lastly, let's think about HFs from a financial stability perspective.

From a macro-financial point of view, HFs manage roughly 1% of global financial wealth¹⁷ and turn over their portfolios approximately considerably more often than institutional fund managers.

Recent steps by the FSB in the area of (i) data gaps and (ii) shadow banking (and by some national regulators like the FRBNY and the BoE) to map the financial system have been motivated by the need to understand the linkages between different sectors of financial markets.¹⁸

HFs are a dynamic and substantial contributor to market activity. The collection of additional data on holdings, exposures and financial flows is the inevitable consequence of regulators and central banks need to leave no part of the financial landscape uncharted.

¹⁷ HF \$2trn compared with McKinsey estimates for global financial wealth (excluding property investments and derivatives) of \$200trn.

¹⁸ See Poszar et al (2010) and Gorton and Metrick (2010).

Issue	US PFIAR	EU AIFMD
Regulation of managers of alternative investment funds	Register with the SEC.	Authorised in their home Member State
Definition of fund	Defined under the US Investment Company Act of 1940 with some exemptions	A broad definition applied
Registration Threshold	\$150m – calculated on basis of “regulatory AUM”	€100m except in the case of managers of closed end funds where the threshold is €500m
Capital Requirement	No	Yes - detailed rules which are more onerous than existing UCITS requirements
Delegation	No	Yes
Transparency requirements	Yes	Yes
Leverage (disclosures and reporting)	Yes	Yes
Depository requirements	No - investment advisers subject to client assets requirements which requires accountant verification of client assets	Yes - AIF must have a depository. Detailed rules for eligible entities, duties and liability are applied
Remuneration	Yes	Yes
Risk and Liquidity management	Yes	Yes
Reporting	Yes	Yes

In the above slide, I have heroically attempted to compare and contrast hundreds of pages of US and EU HF regulation proposed under the DF and AIFMD regimes.

The key points I would highlight are:

1. that the EU sets prescriptive capital requirements whereas the US has no regulatory capital requirement
2. the EU requires independent administrators whereas US HF managers and/or funds have no requirement to appoint independent 3rd party administrators, (although over recent years there has been a trend towards this mostly driven by institutional investors)¹⁹.
3. whilst the US applies client asset requirements which require verification of the assets by accountants, in the EU, in the event

¹⁹ For example, UBP who are a very large institutional HF investor made a public statement post Madoff that they would only invest in HF with an independent administrator

that client assets of an EU HF are lost the consequences for the custodian are more severe under the AIFMD's strict liability rules.

I should also mention that other investment firm regulations (such as MiFID) also matter for HFs.²⁰ The failure of the Lehman's drew attention to the location of prime broker activity globally and how that was influenced by different rules around the rehypothecation of client assets.²¹



To summarise :-

- Investors are vulnerable and require protection
- HF behaviour can have systemic consequences
- Hedge funds are part of a larger complex financial system which needs to be monitored

17

To summarise the case for regulatory intervention, I would note three key points:

1. Investors are vulnerable to information asymmetries and the integrity of HF performance reporting is key
2. HFs trading strategies can have systemic consequences for one or more markets from time to time

²⁰ For example MiFID and the US Securities Act of 1933

²¹ Namely, the fact that there are strict rehypothecation limits for broker/dealers use of client assets in the US under Regulation T whereas in the UK there are not. See Singh and Aitken (2010)

3. HFs are part of a complex global financial landscape which we must understand better

The challenge is to craft regulations which are focussed, proportionate and which efficiently use public and private sector resources²² without unintended consequences or spill-over effects. The differing approaches and priorities of the US and EU are a concern in this regard.



- Regulation has many authors - not all on the same page
- Scale, complexity and 'integratedness' of the global financial system calls for a new approach to crafting financial regulation
- The workings of the Financial Stability Board are the early signs to such an approach but there are issues of scope (too narrow) and representation which must be addressed to create a democratically acceptable global approach to regulation
- We can no longer regulate solely to promote growth and competition – market inefficiencies in a globally integrated world can be very costly and the spillover effects difficult to contain
- There is a need for greater global co-ordination in development of financial regulation – they cannot be driven by purely regional interests given negative externalities (spill-overs) across borders

18

But there is also a substantive point to be made about how we develop and implement regulations in mobile, globally-integrated markets.

My earlier points on how European financial regulation is developed were not aimed at criticising the Lamfalussy process but rather to suggest that the *raison d'être* for regulation, namely tackling the underlying economic frictions, should bring more discipline and focus to the discussions underlying the process.

²² See Sami (2009)

As I explained at the outset, we have, in the past, regulated to achieve competition and economic growth. At times, the increasing scale of the financial industry on both sides of the Atlantic and in Asia has seemed like an arms race. But we have seen the adverse consequences when the financial industry outstrips the real economy in terms of size and importance and where economic frictions are not addressed. In this more mature phase of financial sector evolution, I would argue that we need to focus on the so-called economic frictions which may lead to market failure.

I would be concerned that by allowing regulations to be crafted without these underlying economic frictions in mind and on a regional basis, we risk creating misaligned regimes which have unanticipated and undesirable spill-over effects.

Indeed, across the whole panoply of financial regulation, there is an ever greater need to focus on (a) the underlying economic frictions causing market inefficiencies and (b) achieve tighter global co-ordination. Whilst, the FSB has taken on some of this role (working with the BCBS, IAIS and IOSCO), I will leave that to others to consider the precise institutional arrangements – in terms of scope, representation and accountability – which might take such an agenda forward. In some arenas, like bank capital this has been progressed, but this is only the tip of the iceberg.

Thank you.

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