

## Neil Kellard, Yuval Millo, Jan Simon and Ofer Engel Close communications: hedge funds, brokers and the emergence of herding

**Article (Accepted version)  
(Refereed)**

**Original citation:**

Kellard, Neil, Millo, Yuval, Simon, Jan and Engel, Ofer (2017) *Close communications: hedge funds, brokers and the emergence of herding*. British Journal of Management, 28 (1). pp. 84-101. ISSN 1045-3172

DOI: [10.1111/1467-8551.12158](https://doi.org/10.1111/1467-8551.12158)

© 2016 British Academy of Management

This version available at: <http://eprints.lse.ac.uk/64766/>

Available in LSE Research Online: January 2017

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (<http://eprints.lse.ac.uk>) of the LSE Research Online website.

This document is the author's final accepted version of the journal article. There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

# **Close Communications: Hedge Funds, Brokers and the Emergence of Herding**

Neil Kellard<sup>†</sup>, Yuval Millo<sup>\*</sup>, Jan Simon<sup>\*\*</sup>, Ofer Engel<sup>\*\*\*</sup>

December 2015

<sup>†</sup> Corresponding author: Essex Business School, University of Essex, Wivenhoe Park, Colchester CO4 3SQ. Tel: +44 1206 874153, Fax: +44 1206 873429.  
Email: nkellard@essex.ac.uk.

<sup>\*</sup> School of Management, University of Leicester, University Road, Leicester LE1 7RH.  
Email: ym95@leicester.ac.uk

<sup>\*\*</sup> Segal Graduate School of Business, Simon Fraser University, 500 Granville Street, Vancouver, BC, Canada, V6C 1W6.  
Email: jan\_simon@sfu.ca

<sup>\*\*\*</sup> Centre for the Analysis of Time Series, Tower 1, 11th Floor, London School of Economics and Political Science, Houghton Street, London WC2A 2AE.  
Email: o.engel@lse.ac.uk

# **Close Communications: Hedge Funds, Brokers and the Emergence of Herding**

## **Abstract**

We examine how communication, evaluation and decision-making practices among competing market actors contribute to the establishment of herding and whether this has impact on market wide phenomena such as prices and risk. Data is collected from interviews and observations with hedge fund industry participants in Europe, the United States and Asia. We examine both contemporaneous and biographical data, finding that decision making relies on an elaborate two-tiered structure of connections among hedge fund managers and between them and brokers. This structure is underpinned by idea sharing and development between competing hedge funds leading to ‘expertise-based’ herding and an increased probability of over-embeddedness. We subsequently present a case study demonstrating the role that communication between competing hedge funds plays in the creation of herding and show that such trades affect prices by introducing an additional risk: the disregarding of information from sources outside the trusted connections.

## **Introduction**

As seen most notably in the global financial crisis (GFC) of 2008, unstable financial markets can have a detrimental impact on today’s economy and society. Amongst a variety of explanations for such instability (Stein, 2015), a contributing factor is often thought to be herding among market participants. In the context of markets, herding commonly refers to several actors making the same investment decision either at the same time or in close succession, leading to high concentration of similar market orders and higher risks. Although there is much empirical evidence of the existence of herding in the finance literature (Jiao and Ye, 2014), there are few explorations of the possible underlying social and organizational practices through which herding in financial markets may come about. In particular, the rich conceptualization that evolved in the management and economic sociology literatures around the notion of embeddedness (e.g. Granovetter, 1985; Uzzi, 1996, 1997; Ingram and Roberts, 2000; Uzzi and Lancaster, 2003) has not been utilized effectively. Motivated by this apparent gap in empirical knowledge and conceptualization, in this paper we analyze communication and information-sharing practices among financial organizations and use this qualitative empirical examination to contribute to a theory on the conditions that enable and frame

collaborative decision-making between managers in these competing organizations and, under certain conditions, contribute to the emergence of herding.

Our data is drawn from hedge funds, a sector that is often considered emblematic of the financial industry. Hedge funds, although often managing billions of dollars in assets are typically ‘boutique’, small in terms of employees. However, like other larger financial market participants such as investment banks or mutual funds, these small firms are faced with an almost limitless opportunity set of assets to trade. How do they gain information, interrogate possibilities and make decisions? Social and organizational research in other contexts would suggest that these competitors may communicate closely (Ingram and Roberts, 2000; Uzzi and Lancaster, 2003). If they do, does this contribute to herding and subsequently, effects on market wide measures such as prices and risk?

The qualitative empirical material was collected through interviews with a large number of hedge fund professionals and field visits to hedge funds and brokerage firms. We corroborate the qualitative empirical findings by constructing a map of the interactions-based connections, analyzing them in the light of the institutional, biographical-historical and geographical data collected, and calculating the relevant social network measures. Finally, to illustrate the impact of communication practices, over-embeddedness and its outcomes, we study a single trading position held by a number of connected firms, over a period of several months. By combining these three modes of investigation we aim to capture more comprehensively than previous research the multifaceted nature of the phenomenon of investment-related communication among professional financial investors.

To understand the communication practices among competing hedge funds we first appeal to Podolny (2001) and, in particular, the uncertainties around both market opportunities and the quality of other actors, that drive the use of selective, close-knit ties. The shared and repeated analysis of information that takes place between such ties motivated us to regard this conceptually as ‘expertise-based’ herding, where actors who consider each other ‘smart’ adopt similar trades. Additionally, the seminal work initiated by Uzzi (1996) and Uzzi and Lancaster (2003) suggests that the structure of connections among economic actors can also become over-embedded, whereby a limited set of ideas is circulated among close ties. This can adversely affect the actors through their exposure to a limited information set leading to insulated and potentially risky decision making. We argue that the effects

of the sociological concept of over-embeddedness can be extended into financial market theory, as tightly grouped hedge funds underweight relevant information about prices and risk from sources outside the trusted connections.

The remaining parts of the paper are divided into seven sections: Section 2 considers the literature on communication and herding in financial markets, whilst section 3 provides an overview of the hedge fund industry and likely social connections. Section 4 presents methods and data. Section 5 uses interviews and field observations to explore communication practices whilst section 6 provides the historical-biographical origins of hedge funds' communication practices. Section 7 examines the emergence of herding and wider market risks and finally, section 8 provides a discussion and conclusion.

### **Communication and herding in financial markets**

To begin our explanation of herding in financial markets we turn first to the organizational literature that has explored the conditions that affect communication and decision-making amongst participants in markets *per se*. An important notion is that economic activity is embedded in pre-existing networks of social ties (Baker, 1984; Granovetter, 1985; Uzzi, 1996, 1997), where exchange of information (Ingram and Roberts, 2000) and organizational learning (Uzzi and Lancaster, 2003) take place. In addition to social connections, the widespread adoption of similar trading software and financial models (Zaloom, 2003; Callon & Muniesa, 2005) may serve as conduit for imitation between different investors, thus increasing the homogeneity of views in financial markets (MacKenzie, 2003; Beunza and Stark, 2012).

By contrast with its organizational counterpart, the mainstream finance literature has examined investor behavior such as herding by focusing on prices or trades and then, via some quantitative approach, noted whether these are consistent with investor rationality. For example, a body of work has observed correlated trades and subsequently suggested that investors herd because they have access to the same public information or they infer useful information from each others' trading patterns or they mimic others' trades for reputational and benchmarking concerns (Lakonishock *et al.*, 1992; Grinblatt *et al.*, 1995; Graham, 1999; Sias, 2004; Boyson, 2010). However,

finance literature pays little attention to the possible social mechanisms behind herding. Exceptions include Hong *et al.* (2005) and Cohen *et al.* (2008, 2010) who examine the trading behavior of professional money managers and find that such behavior statistically co-varies more positively when managers are (i) located in the same city and (ii) attended college together and imply contemporaneous social connections between financial decision makers. Indeed, Colla and Mele (2010) construct a theoretical model with heterogeneous information linkages that affect the correlatedness of trades. However, without adopting a qualitative approach it is difficult to directly assess the existence, type and effect of communication between market participants.

Our decision to choose hedge funds as a site for examining communication and decision making and as a potential ‘breeding ground’ for herding is motivated by three factors. First, it is important to understand how hedge fund managers make decisions because of the influence that these organizations have on markets and beyond. For instance, recent finance literature (Singleton, 2014) found that hedge fund trading positions can influence global commodity prices, which, in turn, impact domestic fuel prices. Similarly, a 2014 survey (Tower Watson, 2014) found that a growing share of pension fund assets are managed by hedge funds. Second, there is empirical quantitative evidence of herding in the hedge fund sector (Boyson, 2010) and its wider effects. For example, Jiao and Ye (2014) show that mutual funds herd in response to hedge fund herding and the trading actions of these large mutual funds cause prices to move away from fair values and leads to additional market volatility. Third, and in direct relation to our intention to develop theory about the organizational underpinning of herding, research indicates that recruitment of managers in hedge funds follows a mentoring ‘lineage’ pattern, whereby a manager provides initial financial and professional support to traders once the latter begin their own funds. This lineage pattern contributes to the spread of similar investment strategies and the establishment of strong connections among hedge fund of ‘different generations’ (Choi, 2011) and may contribute to contagion among the funds (Boyson *et al.*, 2010).

## **The hedge fund industry**

A hedge fund is a pooled investment vehicle that is privately organized, administered by professional investment managers and not widely available to the public (President's Working Group on Financial Markets, 1999). Due to their private nature, hedge funds have less restrictions on the use of leverage, short-sales<sup>1</sup> and derivatives, than more regulated vehicles such as mutual funds. Maslakovic (2008) estimates from January 1998 till January 2008 global assets under management grew tenfold from \$221 billion to \$2.25 trillion. Currently, assets under management stand at approximately \$3.13 trillion (Evestment, 2015) with the most popular locations for funds including New York and London.

To explain the main industry and organizational actors, note that hedge funds are typically small, each employing up to 20 people. Hedge fund managers are the most central functionaries in the organization and are commonly founders and partners to the initial capital collected during the setup of the fund. This function's centrality is also reflected in the decision making process. Almost without exception, the hedge fund managers we examined made the final decisions on the composition of the fund's portfolio. Hedge fund managers are often assisted by analysts<sup>2</sup> (i.e., 'buy-side analysts'). The main task of analysts is to develop investment ideas through the assessment of the countries, industries, sectors or companies on which they focus.

Brokerage firms, with which hedge funds interact, typically execute trading orders for hedge funds and may also provide additional capital to leverage market positions or purchase requested assets. The initial contact person for the hedge fund is the salesperson and our interviewees frequently referred to these salespersons as 'brokers.' A broker will frequently provide the hedge fund with initial investment ideas from in-house analysts and may also organize meetings between hedge fund managers and executives from various companies or institutional investors, an activity known as 'corporate access'. They also provide the funds with 'flow information,' descriptive information about the conditions surrounding a possible investment action. For example, whether there are more buyers than sellers for certain assets, the type of institutions that are interested in buying or selling, and the

---

<sup>1</sup> A short sale is a common practice where the hedge fund borrows a stock anticipating that it will drop in price. They subsequently sell the shares and then return the borrowed shares by buying new shares in the market at the lower price (i.e., a price lower than the borrowed shares). In this manner, the hedge fund makes money and the owner of the stock makes money by loaning shares.

<sup>2</sup> The hedge fund managers we observed and interviewed each had between one and four analysts assisting them.

magnitude of specific orders. Finally, traders in brokerage firms are responsible for the actual execution of trading orders on behalf of the brokerage firm's clients.

Given the above, in terms of social connections we shall investigate two types of relationships. The first, given its clear operational requirement, are hedge fund manager and broker ties. The second are ties between hedge fund managers across different firms. Although this latter tie indicates communication between competitors<sup>3</sup>, both empirical (Ingram and Roberts, 2000) and theoretical work (Stein, 2008) suggest this possibility. For example, Stein's model implies that actors will communicate with each other if the expected payoff of collaboration outweighs any prior competitive advantage. This type of mutual co-operation assumes reciprocity to be suitably beneficial in a narrow financial sense and involves the exchange of a single trading idea between two bilateral partners. However, reciprocity can also be expressed through non-financial remuneration. In particular, we would posit that factors - such as legitimization or confirmation - are likely to be a significant motivation for conversation(s). Hong *et al.* (2000) suggest that inexperienced financial analysts avoid making bold forecasts to lessen the probability of making large errors. They argue that giving a forecast closer to the average enables the analyst to 'legitimize' the prediction to internal colleagues and in particular, superiors. Analogously, experienced hedge fund managers may seek 'confirmation' from a trusted peer group of competing managers that the proposed trade is without obvious flaw and recent work (Boyson, 2010) has shown that to maintain reputation, senior hedge fund managers are even more likely to herd than more junior counterparts.

The suggestions above can be further enriched by theory that argues the existence (or absence) of ties between market actors is not only important for the actors who are party to the ties, but is also an important source of information for other actors, as it indicates of the quality of the actors (Podolny, 2001). More generally, knowledge about the social structure itself is an important source for generating knowledge about the market. This theory finds empirical support in works by Sorenson and Stuart (2001), Owen-Smith and Powell (2004) and Hochberg and Ljungqvist (2007). On

---

<sup>3</sup> When asked who their competitors were, hedge fund managers typically cited other hedge fund managers (some also mentioned the market as a whole as their competitor). A possible rationale for competitiveness among hedge funds is provided by Agarwal, Daniel and Naik (2009) who show that hedge funds with good recent performance experience relatively higher money inflows.



the basis of these findings, we see the notion of trust as related to the interpretations actors generate using their observed networks. In particular, we theorize that a hedge fund manager will tend to follow other actors perceived to be of significant quality.

As a final theoretical prop for the likelihood of hedge fund manager to manager connections, we suggest that hedge funds face a large ‘decision space.’ By decision space, we refer to the topography that is described by the possible choices available, the frequency that decisions can be made at and the importance of those decisions. Typically, a professional financial manager in a trading firm faces a very different decision space than the industrial/service firms predominantly studied in the sociological literature.<sup>4</sup> Within the financial market environment, decisions are dynamic and any particular decision to trade can be unwound (or canceled) in any particular future moment. This is because financial markets are relatively liquid and therefore decisions can be made at exceptionally frequent intervals. Indeed not closing a trade, when a position is open, is still a decision that needs to be taken at least daily. Moreover, financial markets contain thousands of assets, so the decision space that professional financial managers face is large. This large decision space, or hyper-decision making environment, brings with it the need for more frequent information and perhaps additional reassurance/confirmation from the directly connected and observed others that make up the fund manager’s trusted social structure.

## **Methods and data**

Our interviews and field work took place between December 2007 and June 2009. Similarly to Knights and McCabe (2015), this period covered the volatile market events of the GFC and, as such, provided ample opportunities to study how hedge fund managers make critical investment decisions. Individual hedge funds typically specialize in one investment strategy. Our sample selection is motivated primarily by our intention to focus on hedged funds that use strategies known as ‘long-short’ or ‘event-driven’. Long-short hedge funds invest by taking positions in different groups of

---

<sup>4</sup> For example, consider the garment manufacturers examined by Uzzi (1997). Once an order is agreed from clothing retailer, the manufacturer faces fairly standard purchasing choices around amount and type of material. However, the original decision to transact with a specific retailer is static, and barring a break in contract, the order will be delivered. In that sense, the decision space is small and as such, a narrow selection of important choices are decided at relatively infrequent intervals.

assets, taking a long position (buying and holding) in one asset and a short position (borrowing – using credit from a prime broker – and selling) in another. Event-driven hedge funds choose their targets of investment based on the announcement and materialization of certain events (e.g., a merger/acquisition or an asset sale after bankruptcy procedures). Three reasons underpin our choice to study hedge funds that use these strategies. The first is our focus on the evolving dynamics of communication among investment professionals, which is illustrated clearly by ‘long-short’ and ‘event-driven’ investment strategies. Hedge fund managers who employ these strategies hold market positions for weeks and even months, during which the positions may be unprofitable. Secondly, both strategies typify elements that distinguish hedge funds from most other investment vehicles: their ability to go short and their focus on arbitrage-like opportunities and thirdly, Smith (2011) shows that these are two of the most popular styles among hedge funds.

Following our intention to contribute to theory, we selected our data collection methods with the dual intention to document practices related to decision-making and to depict the dynamics around the establishment and use of meaningful connections for the actors. We do so by focusing on the production of meanings by the actors. That is, motivating us was the aim to understand what matters to hedge fund managers and brokers as they communicate and made decisions (Rynes and Gephart, 2004; Fuller and Lewis, 2002).<sup>5</sup> To do so, we devised a particular set of questions for the hedge fund managers and for the brokers, based on the different settings. In our analysis, we identified actor-presented themes in the data, which we developed as distinct categories related to practices and norms. We then cross-referenced this data between different informants in order to increase the accuracy and rigour of our findings. Many of the interviews’ questions were aimed, in both the case of the hedge fund managers and the brokers to capture the names of people with whom they have *relevant* professional interactions. In the interviews we defined ‘relevant’ for hedge fund managers as: a connection with a person that ‘has influence on the investment decision, be it directly through idea sharing, or indirectly through second opinion or selective contribution’; whilst for brokers it was

---

<sup>5</sup> This focus on the actors’ interpretative dimension of activities is one of the hallmarks of grounded theory, but we want to stress that while this is a leading motivation in our choice of methodology, we do not subscribe fully to the grounded theory approach (we thank one of the anonymous reviewers for highlighting this point to us).

defined as: ‘hedge fund managers a) with whom you consider to have a good relationship, and b) would belong to your top 20 clients or top client list, if you would have one’.

The dataset we compiled is the first of its kind in terms of scope of coverage. We sampled 36 hedge fund professionals and 24 representatives of the brokerage side whom we interviewed and observed. We employed purposive and snowball sampling (Morse, 2010) using information from interviews to identify and contact other potential informants. The size of the sample represents the hedge funds and brokerage firms in the long-short and event-driven strategies (i.e., active in these strategies or operating on behalf of such actors) who were willing to participate in the research and, in the case of hedge funds, had assets of at least USD 5 billion under their management. The hedge funds in our sample represented the largest 20% of funds in these strategies and in total, managed 15% of hedge funds’ assets under management globally.<sup>6</sup> Interviews were conducted in New York, Hong Kong, London, Geneva, Madrid and a fourth European city that cannot be identified because of anonymity considerations. Brokers were interviewed on the basis that their services were used by at least one of the hedge funds in our dataset. All interviews were recorded and transcribed, and were conducted on the basis of strict anonymity and confidentiality. In addition to the interviews, observatory fieldwork was conducted at eight hedge funds and two brokerage firms. The observations were held typically in blocks of two to five days and, where possible, were repeated at different times throughout the working day. At our request, a rotation system<sup>7</sup> was organized and some informal ‘debriefing’ sessions were held outside the offices of the hedge fund or brokerage firm (often held at coffee shops or at a local bar) to follow up issues that were raised during the observations.

When designing and conducting our interviews, we followed the ‘semi-structured’ approach (see Creswell, 2008). We defined in advance topics that would be examined during the interview. These topics are: daily routines in the hedge fund, practices related to portfolio decisions, communication with persons outside the fund, educational and occupational history of the interviewee, cultural and national background and their social cycle of friends and acquaintances. All

---

<sup>6</sup> As of Dec. 31, 2007, Barclay hedge alternative investment databases.

<sup>7</sup> Rotations consisted of spending between a half a day and two days with different professionals at a same firm. The purpose of this was three-fold: 1) understanding how the different functions interact, 2) observing what information is shared and 3) triangulation of questioning.

topics were explored in the interviews, but we allowed specific questions to be determined according to the context in which the topic was raised in the conversation. Field visits and interviews were chosen as the main tool of data collection because our pilot interviews and site visits indicated that portfolio decision making in hedge funds typically takes place primarily during face-to-face meetings and telephone conversations.

Based on the data collected in the interviews and observations, we also constructed a network of the connections among hedge fund managers and between them and brokers. Towards the end of our data collection period we verified again, through follow up communication with interviewees, that the connections we identified during the interviews were still valid. In the mapping, only connections for which we could establish independent confirmation from both parties that both saw each other as significant participants in portfolio decisions were considered. Here we followed the empiricist approach to network construction, according to which, the network boundary is defined by recording the parties who interact with each other in a certain context (Kossinets, 2008). In this case, the relevant context is discussion about portfolio decisions. In addition, due to resource constraints, we bounded the network by tracing only the immediate connections of each of the managers and the brokers (Marsden, 1990).

**Table 1: Summary data characteristics**

Sample	Full sample	Included in network
No. of observations	60	25
No. of managers	36	20
No. of brokers	24	5
Age range of participants (yrs)	30-53	30-48
Average age of participants (yrs)	38.3	39.8
Std. dev age of participants (yrs)	5.2	4.4
Average time in industry (yrs)	11.7	13.4
Std dev. of time in industry (yrs)	4.7	4.1

Table 1 shows summary characteristics for our data. Consider first that the age range of all participants ranged from thirty to early-fifties, they had worked in the financial industry for an

average of almost 12 years and that the vast majority were men<sup>8</sup>. Overall, from the 60 people interviewed and observed, 74 meaningful communication connections were established, distributed over 25 people who also agreed to provide information about their past employment and their personal connections. Of these actors, five worked on the brokerage side<sup>9</sup> and 20 in hedge funds (14 in London, three in New York, one in Geneva and two in the European city).<sup>10</sup> Finally, note that seven nationalities were involved including participants from the US, the UK and continental Europe.

## **Communicative practices between hedge funds and brokers and among hedge funds**

### *Communication between hedge funds and brokers*

Hedge fund managers seeking flow information constituted the most frequent type of phone calls or emails that brokers received from hedge funds during our observations. Such requests for information were followed up, typically, by brokers conducting some investigation and returning with specific details. For example, manager<sup>11</sup> H17 was developing an investment idea that included buying Telefónica<sup>12</sup> stock, and telephoned a local broker who possessed ‘*a good understanding of the intentions of major holders in the stock*’.<sup>13</sup> The broker<sup>14</sup> (BR7), contacted his Madrid connections and subsequently provided an assessment of the aspirations of significant stock holders augmented with current information about buying and selling activity in Telefónica stock. Flow information, in the words of H9, is ‘*not found on the tape*’; that is, not included in the price and volume information.

The popularity of flow information in communication between hedge funds and brokers is explained by their respective interests. Hedge funds are eager to learn about the identity and intentions of other actors with whom they share the market and brokers, who know that such information may lead to more trade orders, aim to provide the information. In addition, hedge funds rely on the superior variety of connections that brokers have and use them, in effect, as their ‘*ears and eyes in the*

---

<sup>8</sup> The methodology led to three women being sampled.

<sup>9</sup> The brokers examined are all Managing Directors at their firms and responsible for the coverage of hedge funds managers, communicating on a daily basis. As we have noted elsewhere, hedge fund managers were responsible for the final decision over portfolio investments for their fund.

<sup>10</sup> We identified only one broker-broker connection in our network, as was also indicated in our qualitative data. Hence, the questions to brokers referred, in effect, to their connections with hedge fund managers.

<sup>11</sup> Hereafter, a hedge fund manager will be denoted by the generic symbol H and a specific number, e.g., H17.

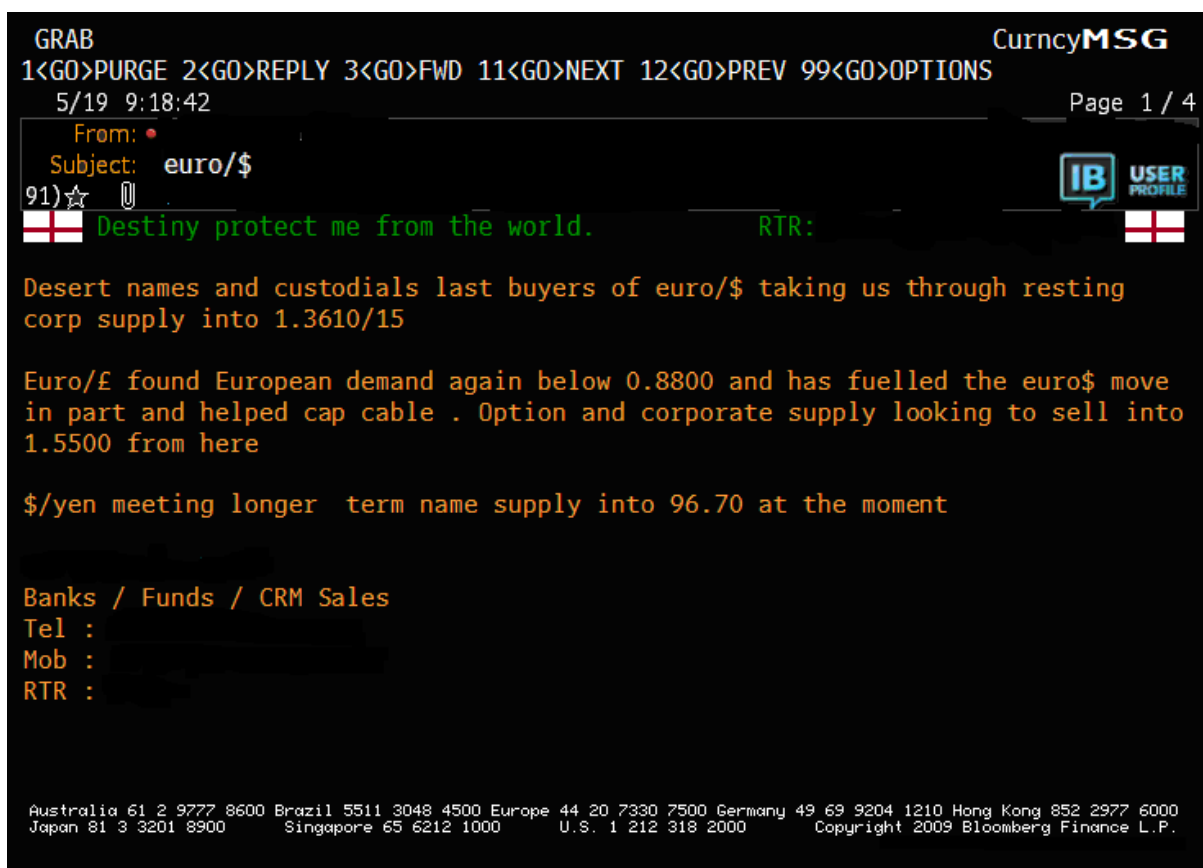
<sup>12</sup> The Spanish multinational company whose stock is traded in the *Bolsa de Madrid*.

<sup>13</sup> Text in italics and contained within single quotation marks represents transcribed speech from interviews.

<sup>14</sup> Hereafter, a broker will be denoted by the generic symbol BR and a specific number, e.g., BR7.

market', as H2 expressed. However, information quality is a diminishing function of the frequency that brokers attempt to contact managers; and it was clearly apparent in our observations that brokers initiate communication with hedge funds (via unsolicited phone calls, emails or an instant message such as Figure 1) at a much higher rate than the latter seek their information. Indeed, it was not uncommon to see hedge fund managers deleting such messages after looking at them very briefly or even without reading them. At times, the hedge fund would call the broker asking if a certain flow indicated by the latter was 'real' or if they were just 'fishing' for a client order.

**Figure 1: Instant message from broker to hedge fund manager**



Notes: Figure 1 shows a Bloomberg screenshot of an instant message from a broker to H7 showing the distribution of general, low quality information, hoping to attract customers. Also, confidentiality restrictions prevent brokers from revealing identities, hence the cryptic language ('desert names', which can be sovereign wealth funds or perhaps oil companies, 'custodials', which are often pension funds).

Another common topic of communication involves investment ideas, H9 explains: *'The way I see brokers is a process of scanning for money making ideas. That is basically what you pay for. You pay for research where they scan companies and they filter all the valuation cases for you.'* This view is prevalent among hedge funds and supported by an economic infrastructure. As brokers and hedge fund managers alike explained, providing investment ideas allows brokers to generate fees, because it is expected that the hedge fund will execute trades via the broker who suggested the relevant strategy. The importance of investment ideas to generate higher fees was clearly stated by our interviewees. It was explained that in present market conditions, brokers that did not supply high fee-paying customers were being dismissed.

Taken as a whole, the set of behavioral conventions described above shows that brokers are motivated to create and maintain communicative connections with as many hedge funds as possible, but not with other brokers. It should be noted that although these numerous connections serve as the basis for generating revenue for the brokerage firm, they directly impact on the quality of information hedge funds share with brokers. To explain, consider that whilst hedge fund managers were eager to learn about *other* hedge funds activities, the informing brokers were also castigated for their *'parasitic behavior'*, a pejorative derived from broker practices of widely disseminating information. H16 and H2, senior hedge fund managers at two of the largest hedge funds globally, comment respectively:

*H16 - 'The sales side people [brokers] are just desperate to print tickets. They do not care how [or] who with and so if they hear a good story [i.e. an interesting idea] - I mean they are starving for stories, they pass it on.'*

*H2 - 'In general they are good people, but you should be wary of them. They engage in what I call parasitic behavior. They try to know or understand what we do. Once they do, they will use that to generate business from another hedge fund. At the same time, they will tell me what other strategies or other hedge funds are doing.'*

Although the quotations above reflect expressions of restrained relationships, we also observed that brokers and hedge fund managers often spoke several times a day, dined together and shared pastime activities such as attending sporting events. However, when we asked senior salespeople in brokerage houses and hedge fund managers to describe the closeness of the relationships, they opined that most

connections were governed by the *'business reality'* (T4). In particular, this meant that the frequency of social engagements represented the level of commissions paid and that crucially, hedge funds only divulged to brokers lower quality information that could be disseminated widely.

### *Connections among hedge funds*

All the hedge fund managers we observed and interviewed employ analogous strategies and therefore compete for capital and return-generating ideas. Despite this competition, a salient characteristic of the daily routines of most observed managers is communication with other managers employing the same strategy. Such communication is frequent; for example, H9 programmed the phone numbers of four competing hedge fund managers into his speed-dial phone system. Our observations reveal that this is not exceptional and that hedge fund managers typically speak several times a day with one or more of their competitors.

Importantly, communication between managers continues throughout the investment decision-making cycle; potential investment ideas are discussed pre-trade, reports are shared on the success or failure of existing positions and finally, internal information related to the running of the fund is divulged. H7 commented on the basis for such frequent contacts: *'I know those people from working in the same financial institutions. One guy that I know is head of a very, very big American hedge fund. He used to be a proprietary trader ten years ago and a colleague of mine.'*

Whilst common biographical history, as we also discuss in the next section, serves as a basis for the connections, a strong norm of informational reciprocity also affects the communicative connection. Investment ideas and insights are shared with the expectation that the 'acquirer' of information will 'pay back' the favor in the form of offering insights or information of their own. H15 explains: *'You try to share information and ideas. It is reciprocity, actually. You will not keep those people as friends if you don't have something else to offer.'*

Information sharing among hedge funds, unlike communication between hedge funds and brokers, also includes an important interpretative dimension, which leads, frequently to collaborative generation of knowledge. Specifically, hedge fund managers expect other managers with whom they share information to offer insights, commentary or criticism during the discussions. We witnessed



many conversations focusing on specific issues relevant to trading positions; issues such as composition of boards of directors, product strategies or implications of regional law. In almost all of these exchanges, whether face-to-face, by phone or email, the goal of the conversations was not to discover a new trading opportunity but to scrutinize existing or contemplated investment ideas.

The exchange of high-quality information between hedge funds is emphasized by noting that although brokerage firms have their own expert-analysts, the hedge fund managers we observed clearly preferred to approach another competing fund when a difficult question arose about a trading position. H11 offers an explanation for this preference. When asked about evaluating the probability of two companies merging, a position being examined at the time, H11 commented: *'I just do not want to be wasting time but I think analysts [in brokerage houses], they sometimes simplify their job a lot...They will, say, put a 50-50 probability on it [the event] and that gives them a target [price], because that just simplifies their life...But if I speak to someone else who is an event-driven investor, they will have done a hell of a lot of work on that. They will have spoken to lawyers and spoken to advisers and spoken to consultants because that is what we focus on. This changes the probabilities. That is just very different from putting 50-50 on it.'*

The motivation to examine and reexamine the trading ideas and in doing so to add new layers of interpretation to a contemplated or existing trade, supports the development and maintenance of close-knit groups within which hedge fund managers share information. It is rare, we witnessed, that a hedge fund manager considers it sufficient to consult only one other competitor. Instead, the manager would contact a second and frequently even a third competitor, sharing some of the earlier information in an attempt to develop a comprehensive view on the relevant trade. The choices of partners to this information-sharing, however is limited by the typical reliance of hedge fund managers on positive past acquaintance as a pre-condition for communication and this strict selectivity results in small groups within which information-sharing takes place.

Managers frequently used the word 'trust' to describe the general set of conditions without which relationships involving the reciprocal exchange of interpretive information were not likely to develop. This empirical finding corresponds with studies (Williams, 2001; McEvily *et al.*, 2003; Schoorman *et al.*, 2007) about trust and the role it plays in other organizations. We identify two

dimensions of trust required to be present to establish communication, each relating directly to the practices we observed. Firstly, a manager must trust the competence of the competitor. H24 noted: *'I trust their opinion about stocks. I have had recently a situation where we were short one stock and the guy at [name of a competing hedge fund] was long. So we met up inside our offices with him to discuss why we had different opinions about the stock. He is very smart, so I wanted to pick his brains and share my views to see who was missing what.'* This exchange, typical of many of the discussions among hedge fund actors, lasted approximately two hours; both participants gaining new perspectives regarding their trading positions and resulting, eventually, in collaborative decision making.

The second dimension of trust we encountered related to the faith a manager places in the integrity of the competitor. We heard the phrases 'integrity', 'a shared set of values' and 'honesty' being used when managers expressed their belief that others in their close-knit groups would not abuse the sensitive information given through the sharing practices. When asked about instances where other managers *did* misuse shared information, it was obvious that the topic made our interviewees uneasy and they were reluctant to proceed. However, in one conversation at the end of a trading day, a hedge fund was mentioned that used its connections to spread false rumors and inflate prices. Our source noted that there were consequences to such capricious behavior: *'Everyone knows about them and now no one talks to them'*.

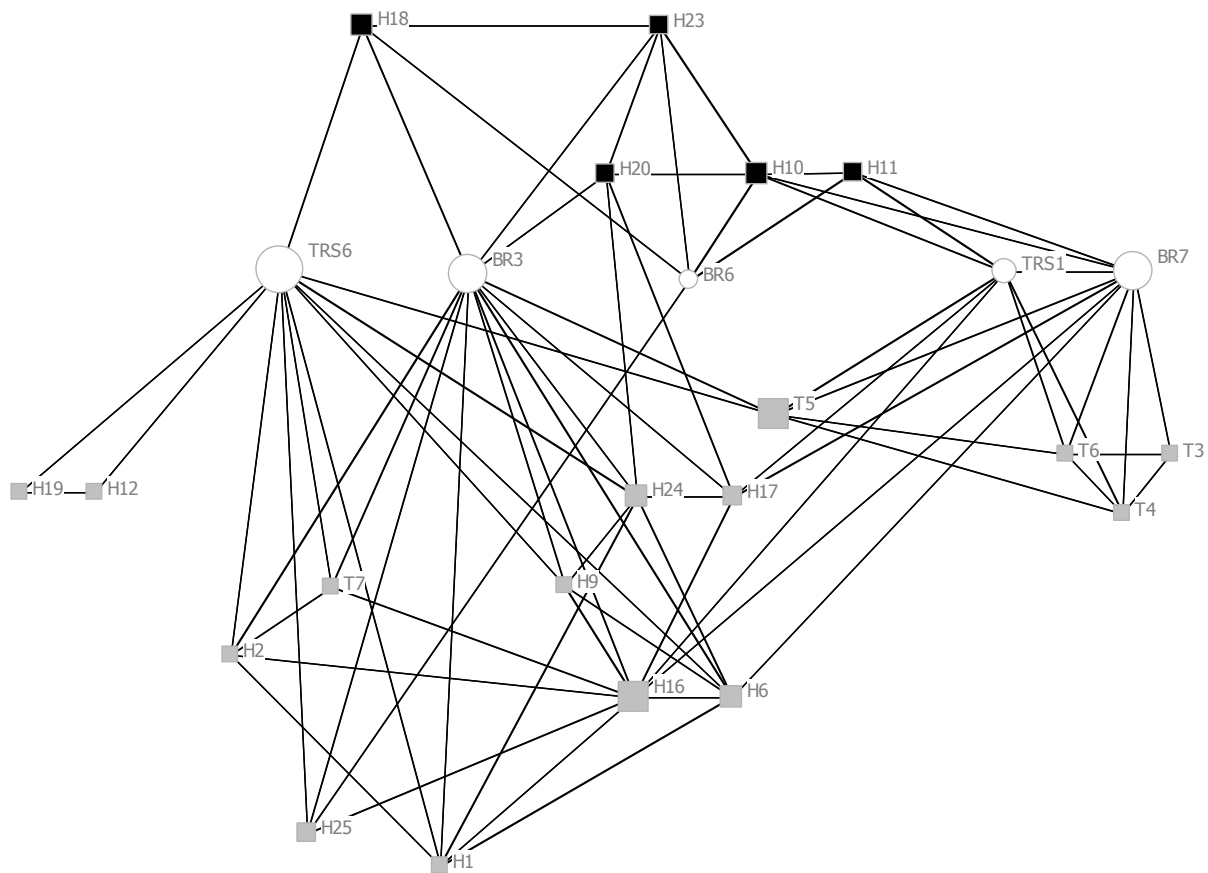
### **The historical-biographical origins of hedge funds' communication practices**

The network of the connections between hedge funds and brokers is presented diagrammatically in Figure 2, with related descriptive statistics in Table 2. In the figure, the five brokers are displayed by five circles placed in a horizontal line at the upper-middle part of the figure. Hedge fund managers are represented by squares; those specializing in event driven strategies are represented by black squares and are placed above the line of brokers. Managers specializing in long-short strategies are represented by grey squares and positioned below the brokers. The size of the node represents its betweenness centrality<sup>15</sup>.

---

<sup>15</sup> The measure of betweenness centrality is based on the number of shortest paths between pairs of nodes in the network on which the measured node is located. The rationale behind the measure is that the more such shortest

**Figure 2: The network of hedge fund managers and brokers**



Notes: The node’s shape represents its role (e.g., circles are brokers and squares are hedge fund managers). The node’s colour represents its dominating strategy (e.g., grey is long-short and black is event driven). The node’s size represents its betweenness centrality.

**Table 2: Descriptive network statistics**

	Average degree	Average aggregate dyadic constraint	Average betweenness centrality	Average eigenvector centrality
Brokers	9.40	0.215	34.83	0.24
Hedge fund managers	5.05	0.473	6.940	0.17

Eyeballing the figure shows that brokers<sup>16</sup> typically have more connections and despite their small number they are instrumental in holding the network in one large component. Hedge fund managers,

---

paths ‘cross’ the measured actor, the more brokerage opportunities are available to the actor. Eigenvector centrality computes recursively the centrality of the node’s neighbors. A node would score higher according to this measure if its direct neighbors (and their neighbors and so on) are centrality located within the network (Freeman 1977, 1979).

<sup>16</sup> Our interview questions were primarily aimed at capturing hedge fund to hedge fund and hedge fund to broker ties. However, we also have qualitative evidence, that broker-to-broker connections are exceptional. For example, BR7, a broker, told us that he found out that a hedge fund was using his investment ideas, but executed the trades through a cheaper broker. BR7 learned about this because the broker who executed the trades was his good friend and shared this information. BR7 emphasised that it was highly exceptional that a broker would

on the other hand, appear to be part of higher density patterns of connections. This is reflected by the measures in Table 2, indicating that brokers have, on average, approximately twice as many direct connections (or ‘degrees’) and half the level of dyadic constraint<sup>17</sup> as hedge fund managers. Brokers are therefore less constrained by virtue of being often connected to actors that are not directly connected to each other. The higher betweenness centrality statistic testifies that brokers ‘hold the network together’ and that their removal would disintegrate the network into separate components.

The qualitative and network evidence thus far both suggest that decision-making in the hedge fund industry relies on an elaborate two-tiered structure of connections. In particular, that brokers aim to have several connections with hedge fund managers, as these connections provide opportunities for generating fees, whilst hedge fund managers tend to be selective and maintain clusters of densely connected and trusted actors. This picture will now be further reinforced by our investigation into the origins of the contemporaneous connections, which further shows that ties between hedge fund managers are underpinned by factors such as prior working experience, mentoring, perceived smartness and common language backgrounds.

To begin, consider Figure 3 which shows an enlarged view of the single triad H16-H9-H6 from our full network diagram; three managers trading a long-short strategy. Next to each node (represented in squares) is a key representing the nationality, seniority and city base of the hedge fund manager. In the case of seniority, the higher the numerical value, the more senior the hedge fund manager. Superimposed over the lines of connection is information relating to the relationship between the two connected managers, as it was reported independently by the managers. This information covers (i) an assessment of the intensity of the relationship: low, medium or high (ii) whether they have worked previously together in the same firm (iii) when they met (iv) whether they socialize: no, sometimes or regularly and (v) whether a mentoring relationship exists? The direction of the arrowhead indicates

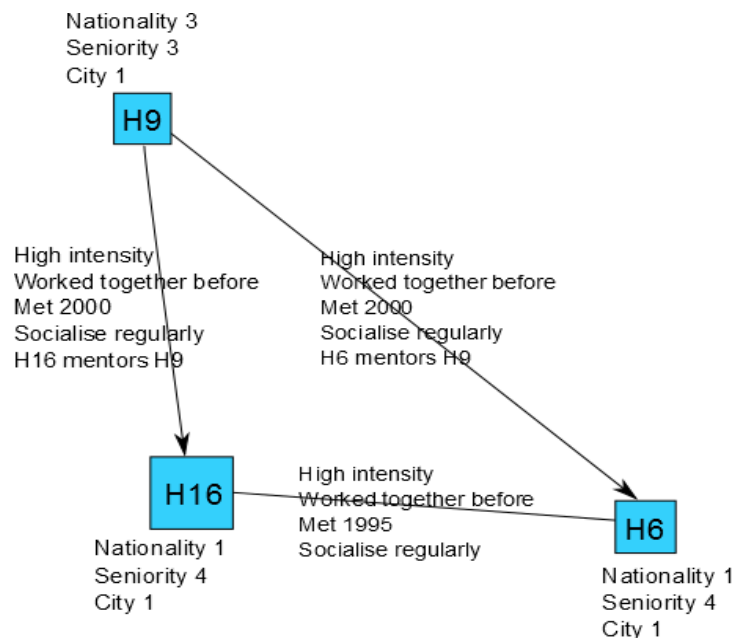
---

share such information with another broker. For expositional purposes, we have indicted this single broker-to-broker tie in Figure 2.

<sup>17</sup> The measure of dyadic constraint is based on the triads to which the measured actor belongs. Complete triads impose a constraint on the actors connected (i.e., no actor can broker between the other two), whilst an incomplete triad enables one actor to gain a potential brokerage opportunity (i.e., as that actor connects the two others). The aggregate constraint is the sum of the dyadic constraints for an actor as a result of the actor’s membership in triads, weighted by the importance of the connections. According to this rationale, a low dyadic constraint is related to increased brokerage opportunities (Burt, 1992; Breiger, 2004).

which manager has reported to typically make initial contact about an information exchange. This information was also corroborated independently by the managers.

**Figure 3: ‘Past mentoring’ triad**

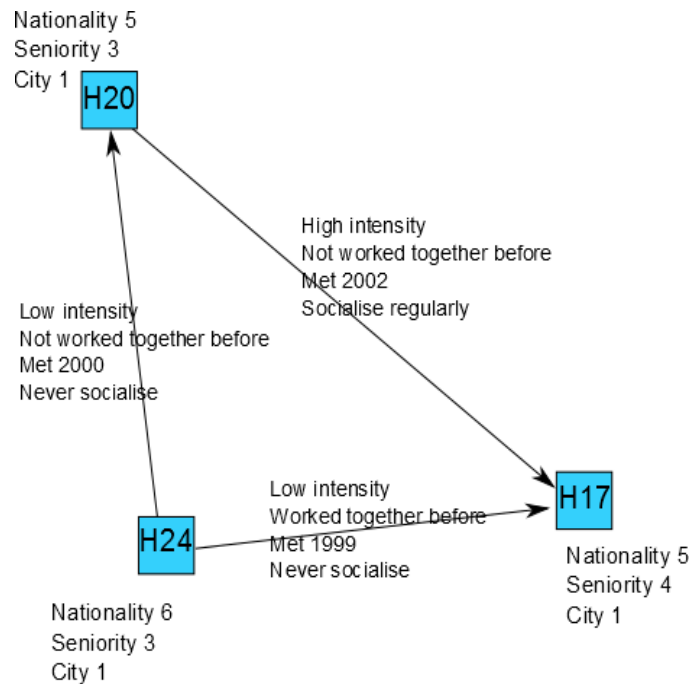


Now all working at different firms, the three hedge managers, like many others we examined worked together previously and now they communicate frequently about work issues and socialize regularly. H9 has less experience than both H6 and H16 and very much looks up to them. Both H6 and H16 provide mentoring to H9. During the time we spent with H9, he worked on two trading ideas and discussed them with H6 who did not think them worth pursuing. In both cases H9 abandoned the ideas. In contrast, during one of those calls, H6 suggested to H9 to examine the relationship between the price behavior of a holding group and a bank in which the holding group had a substantial stake, as a basis for a possible long-short trader. Following this conversation, H9 immediately began gathering information on both companies and analyzed several related charts on his terminal. This example indicates that elements in the hedge fund managers' biographical history (and, in particular, past organizational status differentials) affect their current decision-making practices by directing and framing topics that are deemed suitable for analysis as potential trading ideas. Also, given that the managers had known each other for at least eight years at the time of the interviews (and in the other case, more than 13 years), this example shows us the power of the social connections: for H9, even

after all these years, H6 and H16 were still the 'go to' people when he needed advice about investment ideas.

Figure 4 shows the triad H20-H17-H24; this is an interesting case as the managers connect despite H20 specializing in a different investment strategies from H17 and H24.

**Figure 4: 'Smartness, education and language' triad**



Moreover, as can be seen in Figure 4, two pairs in the triad (i.e. H20-H17 and H24-H20) have not worked together previously. What is driving the information-sharing and connections here? In particular, the H20-H17 pair stands out as it represents a 'high-intensity' relationship. They met when a mutual business contact, a broker of the same nationality, introduced them in 2002. Getting on well and speaking the same language in a foreign country appear to be part of the attraction. However, in addition to the cultural affinity, the primary driver for the connection they reported on was their view on one another that other manager is 'smart'. For example, H20 values the opinion and interpretation from H17 who he sees as "very street-smart", and as "an authentic thinker who always says what he really thinks." H20, for his part, thinks H17 is "very, very smart" and values his academic approach. In one example we observed the pair discussing the appropriate valuation of a large media company. H20 was using a contemporary Private Equity model and H17 asked him to email his valuation spreadsheet and to telephone him back to discuss it. Subsequently, H17, who has been longer in the

business, shared his view based on a more 'traditional' valuation approach. Interestingly, similar educational background does not help explain the H20-H17 connection. Perhaps unsurprisingly, H17 comes from a far more classically academic education. In fact in this case, one might argue that it is the *differing* educational backgrounds, informing the different valuation approaches, that are a significant part of the attraction.

As these examples above and several others omitted for space reasons have shown, factors such as proximity of role whilst working together, mentoring, smartness, language also play significant roles for the maintenance and continuity of ties and consequently in the decision-making process.

### **The emergence of herding and market-wide risks**

How might the two-tiered structure of connections in the hedge fund industry and the related communication practices shown above give rise to herding? In our fieldwork, we noticed that hedge fund managers and brokers frequently referred to certain trading positions as 'consensus trades'. Moreover, numerous hedge fund managers commented that at *any given time* they and other hedge funds they know hold such consensus trades – trading positions that are similar or even identical. Asking about the origins of trading ideas that become 'consensual', several interviewees relate the phenomenon to common educational and professional background. As BR3 explains: *'It is a small village. What is interesting is at the end of the day, we all come from a similar background, we probably studied very similar things and often have worked together doing valuations or what have you together, using the same models. You probably have a big chance that you are going to look at similar things in a similar way, so you come to the same conclusion in a similar timeframe.'*

This quote corresponds with findings we present earlier about the role that common educational and occupational backgrounds play in decision-making. However, while the inception of similar trading is rooted in the past, their development is dependent on the existence of contemporary information-sharing among hedge fund managers, as this description from Prime Broker PBS1 indicates: *'Yes, there are many people that have similar kind of trades. There is a certain universe of*

*consensus trades, everyone has those trades... Because if one hedge fund manager knows that something is cheap he is likely to let another hedge fund manager know it is cheap. People share information, especially among hedge funds.'*

The quote above describes generally the steps that lead to the emergence of consensus trades. However, focusing specifically on how consensus trades come about, we observed their relation to communication practices. For example, we received the following description from H9: *'In general, I would say that it starts with an idea. So somebody must have been the first one to come up with it. You look at it and [a certain stock] looks dirt cheap. So to be sure, you might talk with a couple of your friends at other hedge funds, go through the critical issues you are not sure of. You discuss it, see if you are not missing anything. Finally, you like it and invest in it. The other hedge fund managers are doing the same. By now, some brokers are seeing that hedge funds are [executing the trade] and start telling other similar hedge funds. That is where I think it becomes critical. These other hedge fund managers will analyze it. Because brokers will probably only mention what other hedge funds are doing but not why, and if they give you the why, it will be very general. So these other hedge funds will be doing their own research, talk to other hedge fund managers, etc., and if it makes sense, invest in it. If it does, you start having a consensus trade since at that stage everybody is talking about it: you, your friends, the brokers, other hedge fund managers and even [name of a television host on investments].'*

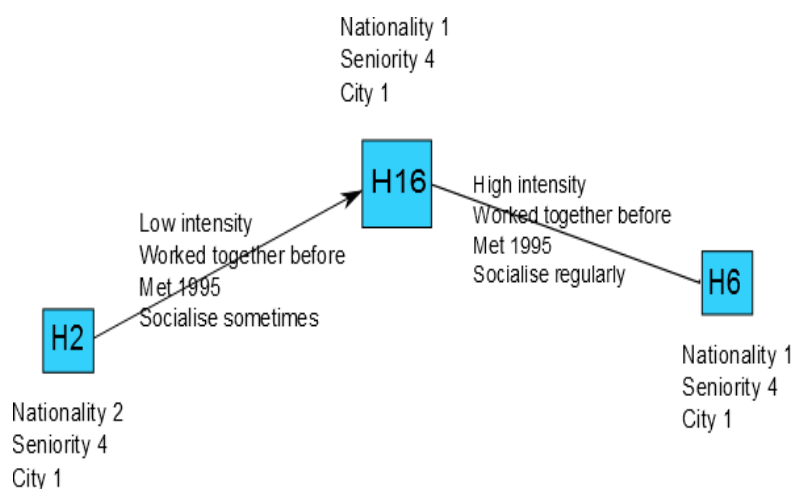
This description captures dynamics witnessed frequently during our fieldwork. Hedge fund managers discussed, interpreted and scrutinized trading ideas with small groups of trusted hedge fund managers. For example, junior hedge fund managers shared ideas with ex-mentors, to test their validity; hedge fund managers revealed trading ideas to trusted peers aiming to get expert opinions about specific implications, the ideas were shared with other hedge fund managers who were considered smart. Overall, the findings above indicate that the communication practices that are exhibited as part of investment decision making in hedge funds also serve as an infrastructure that encourages the emergence of herding, where a number of hedge funds are holding the same or similar trades.



Could the herding enabled by the structures and practices described so far, have wider market outcomes by affecting prices and risk? Evidential support for such a mechanism can only be drawn from observing a consensus trade over its lifecycle and documenting the surrounding communication from within several hedge funds. Fortunately, we had rare access to such an occurrence from January to October 2008, with several of the hedge funds in our sample holding the same ‘long-short’ Volkswagen-Porsche trade. This trading idea involved first, purchasing Porsche stock (the long component) and second, borrowing VW stock (the short component) and selling it immediately in the market. The stock is bought back later and returned to the lender. Clearly, the profitability of the trade is determined by the contemporaneous *difference* between the prices of VW and Porsche.

Throughout the year, the popularity of the trade grew as brokers initially disseminated the broad idea and hedge fund managers we observed discussed the finer details amongst themselves. For example, the managers from our Figure 5 triad were all involved.

**Figure 5: VW-Porsche triad**



When concerns arose about the trade, we observed H16 calling H6 to discuss possible scenarios and action routes to avoid losses. Referring to one of the details discussed, H16 asked H6: ‘*who could be in the know about that?*’ When the conversation ended, we asked H16 about this query:

*Interviewer: ‘Couldn’t one of your brokers look this information up, may be by asking his lawyers or his own prime brokerage?’*

*H16: 'If I do this, they will use it as an argument to other hedge funds to close their positions, generating commissions and increase my losses.'*

In the afternoon, H16 received a telephone call from H6, saying he had just spoken with H2. Even before H16 heard what H2 had to say, it was clear that he was relieved to hear the identity of the person with whom H6 shared the query. H6, H16 and H2 had all worked together at the same investment bank and knew each other well. Immediately after this call finished, H16 called H2, who was the source of the interpretation, discussed the matter in more depth and decided to stay in the trade.

Eventually broker analysts began warning that there may not be enough VW stock available to cover the short positions. This warning was ignored by managers but in late October it was formally announced that only 5.8% of the shares were available for trading. The total amount of shares borrowed stood at 13%, which meant that many of the investors who held short positions would not be able to return the shares to the lenders, were they asked to do so. Indeed, lenders of the VW stock, concerned about the ability of the borrowers to return the stocks under these distressed conditions asked for the stock to be returned immediately. These requests, given the scarcity of VW stock, drove the prices up. This, in turn, increased the concerns and drove even more lenders to ask for their VW shares, resulting in the market price of VW stocks rising more than 6-fold in a few days.

The hedge funds we observed and that were involved in this trade, like many other long-short hedge funds, lost substantial amounts of money and some actually had to close. We were present at one of the hedge funds in late October, when it became apparent that the impact of the crisis was related directly to the structure of connections among hedge fund managers; H16 commented: *'The problem is that we are all positioned the same way, every hedge fund manager I know is screaming for [Volkswagen] stock and just cannot get any. It is all exploding in our face'*.

## **Discussion and conclusions**

Earlier in the paper, we noted that we would examine communication and information-sharing practices amongst hedge funds and then use this empirical work to inform a theoretical discussion on collaborative decision-making, herding and whether over-embeddedness amongst hedge fund managers might impact on prices and risks in financial markets?

The organizational literature stresses that economic activity is embedded in social connections (Granovetter, 1985) but the mainstream finance literature has typically ignored this notion as an explanation for financial market phenomena such as herding. Our interview and observational data confirms that the decision-making in the hedge fund industry, an industry that many consider emblematic of modern financial markets, is embedded in a network of social connections. In particular, we newly identify a two-tiered industry structure underpinned by two different sets of communication practices that the main types of actors follow. Specifically, we show that a hedge fund manager tends to maintain connections with other hedge fund managers, but is selective, preferring small and cohesive groups within which trading ideas are discussed at depth. By contrast, a broker maintains connections with as many hedge funds as possible, but not with other brokers. This tiered structure results from several factors including (i) brokers generate revenue primarily by executing trades for as many funds as possible (ii) hedge funds therefore don't discuss detailed, interpretive trade information with brokers for fear that it will be passed onto many competitors and (iii) by contrast, hedge fund managers discuss such information and analysis with *trusted* competitors. This framework correlates with the distinction between embedded and arm's length ties (Larson, 1992; Hansen, 1999; Lawrence *et al.* 2005; Uzzi, 1997, 1999).

In light of our findings, we can now examine theoretically why hedge fund managers require these embedded ties. Such participants face a large decision space with frequent decisions to be made. One might expect hedge funds to try and have as many networked contacts as possible. However, corresponding with Podolny (2001), who regards network connections both as 'pipes' through which resources and information flow and also as 'prisms', connections through which actors facing uncertainty assess another actor's quality, the number of connections is constrained by the need for these small firms to analyze and interpret, legitimize and confirm. This in turn reinforces the need for smaller, tight-net clusters of funds based on prior ties. This is expressed in our empirical findings

where hedge fund managers repeatedly discuss the characteristics of networked members i.e., trust and smartness.

To assess how these ties between hedge fund managers originate and develop, we construct a network of connections with historical-biographical data superimposed on each node. This reveals that competitor communication practices are rooted in common biographies which encompass prior experience of working together, common respect for the professional abilities or ‘smartness’ of each member of the tight-knit cluster, and shared cultural heritage such as language. When these historical-biographical factors are reinforced by the frequent exchange of good trading ideas and analysis, a strong tie, underpinned by trust, is formed between hedge fund managers. It is this trust that can lead to herding and, ironically, also to additional risks.

Although herding occurs in financial markets (Sias, 2004) and specifically, the hedge fund industry (Jiao and Ye, 2014), little evidence exists of any possible social mechanisms. Our evidence shows that the identified communication practices serve as an infrastructure for the emergence of popular consensus trades where a number of firms adopt the same trade or position. This phenomenon, which we term ‘expertise-based’ herding is different in motivation and process from those previously suggested in the finance literature. Exposed to uncertainty both due to the decision space and with regards to how able and trustworthy other actors are (Podolny, 2001), it is the close and ongoing co-operation demanded by ‘trusted and smart’ hedge fund managers to investigate complex trading ideas, that drives their similar trading positions, as opposed to concerns such as reputation or benchmarking. Moreover, brokers, observing only the manifestations of the hedge funds’ trading behavior (i.e. the actual trades but not the discussions leading to them) disseminate the notions among the other clusters of densely-connected hedge funds, turning relatively isolated trades into wider herding behavior and exacerbating market risks. We see this in the Porsche-VW case study, where a particular long-short trade was held by many hedge funds. Its very popularity meant that when hedge funds attempted to exit the trade at the same time, they could not, driving prices to record highs and causing hedge funds to incur substantial losses.

A final question remains. During the Porsche-VW case study we noted that several brokers expressed concerns about the riskiness of the trade and yet, in spite of these, hedge funds continued to

hold the positions. Why might investors like H16 miss or ignore relevant information? H16 belonged to a cluster of trusted hedge fund managers who created and maintained, we observed, a distributed decision making practice regarding the VW-Porsche trade. Even when it became apparent that the trade was riskier than initially appeared, H16 eschewed contacting brokers, in favour of conversations with H6 and H2. We suggest that such communication practices, which reflect expertise-based herding, may lead to the emergence of over-embeddedness (Uzzi, 1996; Uzzi and Lancaster, 2003) among hedge funds. That is, similarly-minded actors, appreciating each others' intellectual capacities and integrity, increasingly circulate among themselves a limited set of ideas and views, which, in turn, become amplified due to repeated reassurance and lead the actors to become effectively insulated from relevant developments in other parts of the network. In other words, the two-tiered industry structure implies that hedge funds have a tendency to assign lesser weight to relevant and available information, when such information originates from brokers. This theoretical insight underpins an additional risk in financial market theory: the risk of disregarding relevant information from sources outside a trusted set of connections.

We acknowledge a number of limitations of the study. First, our use of snowball sampling introduced the risk of missing relevant informants. Second, we examined the hedge fund industry during a particularly volatile period in the markets. Whilst we suggest that this encourages the type of communication practices we witnessed, we also need to be aware of the possibility that in calmer times, such practices may be less influential. Third, detailed numerical data for each and every trading position are held privately and are not available. Access to this data would allow us to further our investigations into the connections between communication practices and market impact.

Our findings have implications at both the firm and regulatory level. Several of the hedge funds observed were interested in the outcomes of this research and in particular, how to assess their own 'network risk'. A possible approach would be for individual funds to use the social network techniques used in this paper in a local sense; connections between hedge fund managers within the fund and those outside could be mapped and the strength of connections reviewed regularly. From an industry perspective, SEC regulations that follow the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 already require hedge funds to disclose details about their trading and

investment positions and their valuation policies and practices (SEC, 2011). In a next step, and analogously to Basel II requirements on operational risk, regulators might also require funds to self-report on their social networks, allowing them to build up a picture of social interrelationships and vulnerabilities within the industry cross-referenced with trading positions. Future regulation could therefore incorporate network risk, allowing the regulator to supervise and intervene in networks where necessary. This can also be supported by future research that follows our analysis and traces the linkages between the organizational practices of other financial market participants (e.g., foreign exchange or commodities traders) and financial phenomena like herding or speculative attacks.

## References

- Agarwal, Vikas, Naveen D. Daniel, and Narayan Y. Naik, (2009), Role of managerial incentives and discretion in hedge fund performance, *The Journal of Finance* 64, 2221-2256.
- Baker, Wayne, 1984, The social structure of a national securities market, *American Journal of Sociology* 89, 775-811.
- Beunza, Daniel, and David Stark, (2012), From dissonance to resonance: Cognitive interdependence in quantitative finance, *Economy and Society* 41, 383-417.
- Boyson, Nicole M., (2010), Implicit incentives and reputational herding by hedge fund managers, *Journal of Empirical Finance* 17, 283–299.
- Boyson, Nicole .M., Christof .W. Stahel, and René .M. Stulz, (2010), Hedge fund contagion and liquidity shocks, *The Journal of Finance* 65, 1789-1816.
- Breiger, Ronald L., (2004), The analysis of social networks, in Melissa Hardy and Alan Bryman, eds: *Handbook of Data Analysis* (Sage).
- Burt, Ronald S., (1992), *Structural Holes: The Structure of Competition* (Harvard University Press, Cambridge, MA).
- Callon, Michel, and Fabian Muniesa, (2005), Peripheral vision: Economic markets as calculative collective devices, *Organization Studies* 26, 1229-1250.
- Choi, Joon Nak, (2011), Clannishness, gossip and the paradox of imitation: Hedge fund sociality and investment returns, Working paper.

- Cohen, Lauren, and Andrea Frazzini, (2008), Economic links and predictable returns, *The Journal of Finance* 63, 1977-2011.
- Cohen, Lauren, Andrea Frazzini and Christopher Malloy, (2010), Sell-side school ties, *The Journal of Finance* 65, 1409-1437.
- Colla, Paolo, and Antonio Mele, (2010), Information linkages and correlated trading, *Review of Financial Studies* 23, 203-246.
- Creswell, John W., (2009), *Research design: Qualitative, quantitative, and mixed methods approaches* (Sage, Thousand Oaks, CA).
- Evestment, (2015), Global hedge fund asset flows report, April 2015.
- Freeman, Lynton. C., (1977), A set of measures of centrality based on betweenness, *Sociometry* 40, 35-41.
- Freeman, Lynton. C., (1979), Centrality in social networks: Conceptual clarification, *Social Networks* 1, 215-239.
- Fuller, Ted, and Jennifer Lewis, (2002), 'Relationships Mean Everything'; A typology of small-business relationship strategies in a reflexive context. *British Journal of Management* 13, 317-336.
- Graham, John, R., (1999), Herding among investment newsletters: Theory and evidence, *The Journal of Finance* 54, 237-268.
- Granovetter, Mark, (1985), Economic action and social structure: the problem of embeddedness, *American Journal of Sociology* 91, 485-510.
- Grinblatt Mark, Sheridan Titman, and Russ Wermers, (1995), Momentum investment strategies, portfolio performance, and herding: A study of mutual fund behavior, *American Economic Review* 85, 1088-1105.
- Hansen, Morten T., (1999), The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits, *Administrative Science Quarterly* 44, 82-111.
- Hochberg, Yael. V., Ljungqvist, Alexander., and Yang Lu, (2007). Whom you know matters: Venture capital networks and investment performance. *The Journal of Finance*, 62(1), 251-301.

- Hong, Harrison, Jeffrey D. Kubik and Amit Solomon, (2000), Security analysts' career concerns and herding of earnings forecasts, *RAND Journal of Economics* 31, 121-144.
- Hong, Harrison, Jeffrey D. Kubik and Jeremy C. Stein, (2005), Thy neighbor's portfolio: word-of-mouth effects in the holdings and trades of money managers, *The Journal of Finance* 60, 2801-2824.
- Ingram, Paul, and Peter W. Roberts, (2000), Friendships among competitors in the Sydney hotel industry, *The American Journal of Sociology* 106, 387-423.
- Jiao, Yawen, and Pengfei Ye, (2014), Mutual fund herding in response to hedge fund herding and the impacts on stock prices. *Journal of Banking and Finance* 49, 131-148.
- Knights, David and Darren McCabe, (2015) 'Masters of the Universe': Demystifying leadership in the context of the 2008 Global Financial Crisis. *British Journal of Management* 26, 197-210.
- Kossinets, Gueorgi, (2006), Effects of missing data in social networks, *Social Networks* 28, 247-268.
- Lakonishock, Josef, Andrei Shleifer and Robert W. Vishny, (1992), The impact of institutional trading on stock prices, *Journal of Financial Economics* 32, 24-43.
- Larson, Andrea, (1992), Network dyads in entrepreneurial settings: A study of the governance of exchange processes, *Administrative Science Quarterly* 37, 76-104.
- Lawrence, Thomas B., Eric A. Morse and Sally W. Fowler, (2005), Managing your portfolio connections, *MIT Sloan Management Review* 467, 59-65.
- MacKenzie, Donald, (2003), Long-Term Capital Management and the sociology of arbitrage, *Economy and Society* 32, 349-380.
- Marsden, Peter V., (1990), Network data and measurement, *Annual Review of Sociology* 16, 435-463.
- Maslakovic, Marko, (2008), Hedge Fund Industry 2008. IFSL Research.
- McEvily, Bill, Vincenzo Perrone and Akbar Zaheer, (2003), Trust as an organizing principle. *Organization Science* 14, 91-103.
- Morse, Janice M., (2010), 'Sampling in grounded theory.' In Bryant, A. and Charmaz, K. (Eds), *The Sage Handbook of Grounded Theory*. Los Angeles: Sage, 229-244.
- Owen-Smith, Jason, and Walter W. Powell, (2004). Knowledge networks as channels and conduits: The effects of spillovers in the Boston biotechnology community, *Organization Science* 15, 5-21.



- Podolny, Joel M., (2001), Networks as the pipes and prisms of the market, *American Journal of Sociology* 107, 33-60.
- President's Working Group on Financial Markets, (1999), Hedge funds, leverage, and the lessons of Long-Term Capital Management, Report of the President's Working Group on Financial Markets.
- Rynes, Sara and Robert P. Gephart, (2004), From the Editors: Qualitative Research and the "Academy of Management Journal." *The Academy of Management Journal* 47, 454-462.
- Schoorman, F. David., Roger C. Mayer and James H. Davis, (2007), An integrative model of organizational trust: Past, present, and future. *Academy of Management Review* 32, 344-354.
- Securities and Exchange Commission, (2011), SEC adopts Dodd-Frank act amendments to investment advisers act (Accessed 20 November, 2012, from <http://www.sec.gov/news/press/2011/2011-133.htm>).
- Sias, Richard W., (2004), Institutional herding, *Review of Financial Studies* 17, 289-315.
- Singleton, Kenneth, (2014), Investor flows and the 2008 boom/bust in oil prices, *Management Science* 60, 300-318.
- Smith, Edward Bishop, (2011), Identities as lenses: How organizational identity affects audiences' evaluation of organizational performance, *Administrative Science Quarterly* 56, 61-95.
- Sorenson, Olav, and Toby E. Stuart, (2001). Syndication networks and the spatial distribution of venture capital investments, *American Journal of Sociology* 106, 1546-1588.
- Stein, Jeremy C., (2008), Conversations among competitors, *American Economic Review* 98, 2150-2162.
- Stein, Mark, (2015) Double trouble: Sibling rivalry and twin organizations in the 2008 credit crisis. *British Journal of Management* 26, 182-196.
- Tower Watson, (2014), Alternative assets 2014 Survey, Tower Watson, London.
- Uzzi, Brian, (1996), The sources and consequences of embeddedness for the economic performance of organizations: The network effect, *American Sociological Review* 61, 674-698.
- Uzzi, Brian, (1997), Social structure and competition in interfirm Networks: The paradox of embeddedness, *Administrative Science Quarterly* 42, 35-67.

Uzzi, Brian, (1999), Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing, *American Sociological Review* 64, 481-505.

Uzzi, Brian, and Ryon Lancaster, (2003), Relational embeddedness and learning: The case of bank loan managers and their clients, *Management Science* 49, 383-399.

Williams, Michele, (2001), In whom we trust: Group membership as an affective context for trust development. *Academy of Management Review* 26, 377-396.