Noise trading and the management of operational risk; firms, traders and irrationality in financial markets

Journal Item

Noise Trading and The Management of Operational Risk; Firms, Traders and Irrationality in Financial Markets.

Paul Willman, Mark Fenton-O'Creevy, Nigel Nicholson, Emma Soane*

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Corresponding Author
Paul Willman, Professor of Management, Said Business School, University of Oxford, OX1 1HP
Email paul.willman@sbs.ox.ac.uk

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* Paul Willman is Professor of Management at Said Business School, Oxford University; Mark Fenton-O'Creevy is Professor of Organisational Behaviour, Open University Business School, Nigel Nicholson is Professor of Organisational Behaviour at London Business School; Emma Soane is a Reader in Occupational Psychology at Kingston Business School.

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Abstract

Efficient market models cannot explain the high level of trading in financial markets in terms of asset portfolio adjustment. It is presumed that much of this excessive trading is irrational 'noise' trading. A corollary is that there must either be irrational traders in the market or rational traders with irrational aberrations. The paper reviews the various attempts to explain noise trading in the finance literature concluding that the persistence of irrationality is not well explained. Data from a study of 118 traders in four large investment banks are presented to advance reasons why traders might seek to trade more frequently than financial models predict. The argument is advanced that trades do not simply occur in order to generate profit, but it does not follow that such trading is irrational. Trading may generate information, accelerate learning, create commitments and enhance social capital, all of which sustain traders' long term survival in the market. The paper treats noise trading as a form of operational risk facing firms operating in financial markets and discusses approaches to the management of such risk.

Key Words

Operational risk; Organisational Control; Financial Markets; Traders; Noise Trading; Agency Theory;

Introduction

This paper seeks to contribute to the understanding of the management of risk taking behaviour by firms operating in financial markets. It focuses on a widespread and poorly explained phenomenon – the volume of trading in financial markets. This volume is much higher than economic models predict; in such models it appears as irrational noise trading. We argue that an analysis grounded in an understanding of trader behaviour within firms in financial markets assists understanding of the phenomenon and we provide data from a field study of traders in support of this argument.

The structure of the paper is as follows. Section 2 provides a background analysis of irrationality in financial markets. Section 3 looks specifically at the noise trading literature. Section 4 outlines our methods and data collection techniques. Section 5 presents the data and findings. Section 6 discusses the broader implications of the study for organisational management of risk.

1. Analysing Markets

The growth in scale and influence of financial markets has been accompanied by the rise of financial economics as an academic sub-discipline, particularly within business schools. The discipline is characterised by mathematically rigorous analysis of markets that are assumed to be relatively free of imperfections. Markets arise naturally, operate efficiently and adjust instantaneously to new information; profit opportunities are fleeting and investors rational.

The core proposition is Fama's [1970; 1991] efficient markets hypothesis, the essence of which is that asset prices reflect all available information. In his later review he summarises the three forms of the hypothesis as follows

> "(1) weak-form tests (How well do past returns predict future returns?), (2) semi-strong-form tests (How quickly do security prices reflect public information announcements?), and (3) strong-form tests (Do any investors have private information that is not fully reflected in market prices?) [1991; 1576]

Investors are assumed to be rational, and to trade on publicly available information. Imperfections in the market occur, but are quickly removed by arbitrage, in which traders spot anomalies in pricing and take profit in removing them.

The elegance of the proposition and its explanatory power across a range of market phenomena have not immunised it from assault by those who observe irrationality in financial markets. Indeed, the detection and explanation of such irrationality is the core of the behavioural finance project. Excess volatility [Schiller; 1981], overreaction to news [De Bondt and Thaler;1987] and speculative bubbles [Schiller, 2000] are examples of phenomena addressed by using psychological literature on cognitive biases and heuristics to address anomalies eluding explanation by the efficient markets hypothesis. The approach generally taken by behavioural finance academics is to identify an apparent anomaly at the aggregate market level, for example over-trading of specific stocks, then attribute it to the widespread activation across the trading population of individual cognitive biases, for example the representativeness heuristic, or overconfidence [Odean 1999; Barber, Odean and Zhu 2003]

At its worst, this form of sampling on the dependent variable simply produces a list of anomalies to which a convenient cognitive bias is attached [e.g. Shefrin, 2000]. The process of aggregation by which individual heuristics become collective market phenomena is not generally addressed. The distribution and timing of anomalies cannot easily be predicted. Although the evidence of irrationality in markets is by now impressive, the behavioural finance literature has yet to develop a *theory* of irrationality – what finance academics term 'investor sentiment' – to displace the efficient markets hypothesis. As a result, the efficient markets hypothesis remains a key part of mainstream financial economics. However, as we attempt to show below, its concepts of rationality and irrationality are, respectively, narrow and very broad, and activities which sociologically or psychologically might be depicted as rational fall without the economic definition.

As Shliefer [2000;1-28] notes, by itself the presence of irrationality does not particularly undermine the efficient markets hypothesis in its weak form. It is after all concerned with the behaviour of prices, not investors. Irrational investors may enter and even persist in markets but for this to undermine even the weak form of Fama's proposition two rather strong conditions must be fulfilled. First, investor irrationality must be intercorrelated, thus having a directional impact on asset prices away from underlying value; individual traders are unlikely to affect asset prices generally, but if they act according to shared biases, they may. Second, there must be a scarcity of exploitable arbitrage opportunities preventing rational investors in the market from making profit from irrationality by eradicating price anomalies. Empirical evidence consistent with the existence of these conditions – such as the dot com boom – abounds but the theory of investor sentiment and the model of arbitrage scarcity which might fully explain it do not.

Building a [behavioural] theory of investor sentiment out of the cognitive biases literature is in fact a daunting task. That literature itself contains few propositions not inferred from experimental evidence and no overarching theory of decision making. Incidence and sources of variation of particular heuristics are not well addressed. Perhaps as a consequence, much of the best work in behavioural finance, such as Odean's [1998] work connecting loss aversion to reluctance to sell falling stocks, relies on a rather simplistic crowd psychology to underpin the mathematical elegance.

Arguably, the more recent literature on the sociology of financial markets is making better progress in providing grounded explanations of trader behaviour. Early work by Baker [1984a and b] explained volatility in pit trading in terms of the elaboration of social networks and Abolafia's [1996] ethnographic work in bond and equity markets indicated the relationship between use of particular decision heuristics and features of market operation. In both cases, apparent irrationality is seen to be rooted in the pattern of trading interactions in the market. More recently, in the analysis of market institutions, MacKenzie and Millo [2003] have illustrated the operation of social forces and their impact on market prices. In the analysis of the Chicago financial derivatives exchange, they show the “performativity” of financial economic theory; i.e. use of the Black-Scholes-Merton pricing formula by traders caused derivative prices to converge on its predictions and ‘helped make one of its own key assumptions – that stocks could be purchased entirely on credit – true’. In the analysis of the demise of Long Term Capital Management, MacKenzie [2003] is able to elaborate a sociology of arbitrage in which processes of imitation generate an irrational flight from attractive arbitrage opportunities. A key insight here, and indeed in Abolafia’s work, is the reflexivity of financial markets. Actors are aware of and trained in the tools of financial economics and the use of such tools itself conditions market outcomes.

The early sociological work dealt primarily with face-to face trading. Given the evidence that electronic trading has an impact on trading behaviour, particularly trading frequency [Choi et al, 2000], sociological analysis of electronic markets – which now dominate equity and bond transactions – is important. Knorr-Cetina and Bruegger [2002] paint a picture of disembodied transactions in foreign exchange markets which constitute a dematerialised virtual society nonetheless subject to certain general transactional norms. However, focusing on the firm rather than the market, Beunza and Stark [2004] use similar ethnographic techniques to paint a very different picture of how arbitrage strategies may emerge through repeated face to face conversations *within* firms to be subsequently exercised in electronic market transactions. Study of the complicated relationship between large firms which dominate market transactions and the global electronic networks which sustain them is absent from the behavioural finance literature but key to understanding market behaviour. We develop this point in more detail below.

Focusing directly on market prices, Zaloom [2003] paints a very different description of price perceptions from the simple ‘price-taking’ approach of the efficient markets hypothesis. Rather than seeing prices as unproblematic conveyers of information, her ethnography of London and Chicago foreign exchange traders depicts a process in which market actors “search out social information contained within the bid and ask prices that anchor their knowledge of the market”. Prices in this view are quantitative information fronting deeply embedded social information. Traders look at prices in order to discover “social reasons for the movement of the market” – this involves “crafting” the identity and motivations of market competitors [2003; 261, 264.]

In summary, then, financial markets do not operate as arenas for transactions underpinned by unbounded rationality. Apparent irrationality exists and it appears to affect market outcomes. In explaining it, one may seek to fit market anomalies to the operation of decision biases; to the extent that the source and distribution of such decision biases remains elusive, understanding is limited and prediction is difficult. One may try to understand financial markets as social institutions, fundamentally transactional in nature, but within which traders operate reflexively under bounded rationality and subject to organisational constraints. We deploy this approach below to the study of noise trading.

3. Noise

As Dow and Gorton [1997; 1025-6] note ‘there appears to be a consensus that trading volume or turnover (trading volume as a fraction of total market value) is inexplicably high’. A very large proportion of transactions [approximately 75%] are inter-bank transactions. This is problematic; under assumptions of rationality, trading should take place primarily when investors seek to adjust their portfolios. Participants in the market are trading when they should not, and thus exposing themselves to risk. They may be doing so for hedging or liquidity reasons [i.e. rationally], or they may be economically irrational, i.e. guided by sentiment or reasoning not related to material trading outcomes.

We have chosen to focus on noise for several reasons. First, it is pervasive in bond and equity markets. Second, because so much of it appears to involve inter bank transactions, we can see it as an organisational as much as a market phenomenon; banks or their agents engaged in noise trading are indulging their appetites for gain and their willingness to bear risks to do so. Third – and most important – conventional finance theory finds this pervasive market phenomenon difficult to explain and this failure illuminates certain limitations of the concept of rationality embedded in the efficient markets hypothesis.

Black originated the term ‘noise’ to describe this excess trading. He remarks

> “People who trade on noise are willing to trade even though from an objective point of view they would be better off not trading. Perhaps they think the noise they are trading on is information. Or perhaps they just like to trade [1986; 531].

It is worth noting that in this early formulation, noise trading may arise either from error or from sensation seeking; we return to this below.

Noise trading is perhaps the most pervasive example of apparently intercorrelated irrationality in financial markets. It has generated a considerable literature in both mainstream and behavioural finance literatures. We argue here that they do not sum to an adequate explanation of the phenomenon.

There have been several approaches. Friedman [1953] classically depicted noise traders as a transient naïve presence in markets who would buy high and sell low, so disappearing over time. By contrast, in his argument Black is in addition suggesting that trading activity might itself enter the utility function of any or all traders as a source of enjoyment, particularly where profits are being made [1986, 533]. He goes on to remark that if things like enjoyment of trading go into the utility function very little of expected utility theory can be salvaged. Dow and Gorton [1997] argue that noise trading exists because investors [principals] force traders [agents] to trade rather than be idle; the latter find it difficult to justify actively doing nothing. It is thus a feature of agency in the market and thus by implication a feature of the behaviour of informed agents, typically in investment banks, rather than simply naïve principals.

This third approach roots noise trading in a specific institutional feature of the market- the presence of agent traders in large firms. Given the volume of inter bank transactions, the Dow and Gorton approach addresses the possibility that noise may be generated by sophisticated agents in large investment banks. In fact, in this approach noise trading is both a source of operational risk rooted in agent behaviour from the point of view of the firm, and a source of liquidity in the markets with possible welfare benefits. When traders trade on noise, either the bank's funds or those of its customers incur unnecessary risk.

From these three examples it is clear that we may have at least three different conceptions of the sources of noise trading; they are not mutually exclusive. First, noise trading emerges from a continuous supply of naïve traders entering the market, second, it rests in sensation seeking propensities to which perhaps all traders are potentially prone, third, it is a market distortion ultimately attributable to the presence of firms in which agency relationships arise. In addition, there have been two units of analysis in the finance literature on noise; first, noise traders as individuals, depicted as an irrational segment of the market and, second, noise trading as an activity, depicted as an aggregate market phenomenon.

Explaining noise has proved intractable. The traditional approach to the “irrational segment” argument was that such irrational traders would be inefficient and disappear. However, more recent approaches take a more radical view. De Long et al [1990] argue, first, that noise traders are irrational, having ‘erroneous stochastic beliefs’. Second, irrationality helps, in that the additional risk associated with it may generate higher expected returns than those accruing to rational traders. Third, the rational traders’ reaction to irrationality may cause prices to diverge from fundamental values. Shliefer and Summers [1990; 26, 28-9] take the point about arbitrageurs reaction further, arguing that where arbitrageurs pick stock, bet on mood swings, or engage in positive feedback trading strategies, then “it becomes hard to tell the noise traders from the arbitrageurs” both may be “feeding the bubble” [1990; 26] Since prices are affected and there are positive returns to irrationality, little of the efficient markets hypothesis remains here.

If, as Black argues in the second approach, noise is about sensation-seeking, then clearly we need something other than the efficient market hypothesis to explain it. However, the approach taken here is that sensation seeking is only one of the irrational – in finance terms – motives one might wish to examine in order to explain the empirical volume of trades – we return to this below.

The third approach, seeing noise as the outcome of the behaviour of sophisticated agents behaving [as agents] rationally locates it as a property of significant market institutions rather than the market periphery but the model Dow and Gorton present is both simple and provocative. It is simple in that their model posits that the agent cannot convince the principal that *any* inactivity is positive and thus must noise trade hoping to produce returns by chance [1997;1029]. It is provocative in that the implied outcome, that principals will be risk neutral but agents risk-seeking, runs contrary to the conventional assumptions of agency theory which see agents as risk averse [Jensen and Meckling 1976]. In fact, modifications to agency theory which we discuss below have developed more contingency-based models which elaborate the circumstances in which risk aversion and risk-seeking by agents may be predicted [Wiseman and Gomez-Meija, 1998]. It is possible that certain types of agency might have a greater propensity to encourage noise trading than others and thus that the organisation's choice of agency arrangements might have an impact on exposure to this form of operational risk.

If there are in fact two additive social processes – naïveté among unsophisticated principals and accountability noise among sophisticated agents – we may be on the way to grounding the origins of excessive trading in the variable social structures of markets. However, given the dominance of institutional investors in bond and equity markets and the volume of trading generated it is likely that noise trading is an organisational as much as a market phenomenon and that in order to understand it, simple concepts of investor error will not do.

Recent sociological work on agent traders in financial markets does point the way towards an explanation of the sources of noise trading, without being specifically concerned with it as a market outcome. It does so by isolating social processes within markets which might encourage participants to trade. We isolate four interrelated processes for discussion here; learning, information search, reciprocity and network building. All, we argue, are rooted in sociological features of the market. All might encourage apparently irrational risk taking behaviour in the short term as part of a long term market survival strategy.

Previous work on financial markets has suggested all such processes exist. Abolafia [1996; 26] notes that the intuitive processes central to trader performance are built up through 'trial and error experience'. Beunza and Stark [2004; 371] refer to traders 'conducting experiments to test the market'. Much of the information traders have or are seeking to access is tacit and quasi-proprietary in that other traders are seeking to protect it [Willman et al, 2001; Zaloom, 2003]. Simple information requests are both difficult and unreliable in electronic markets and the test of many intuitive and embryonic trading strategies can only be a trade. Much information is available on screens in sophisticated trading rooms and immense amounts of computing power are available to simulate trading outcomes, but as Beunza and Stark note, in configuring the screen content, traders' own assumptions become part of this decision support. Moreover, as one of Abolafia's respondents [1996;24] notes, "you need to know what people *think* the information means" and for this some form of interaction is necessary. Noise trading may represent a cost of learning through market testing; put another way a cost of using the price mechanism may be price testing incurring transaction costs.

Abolafia also [1996; 176] notes that “norms of exchange and reputations for trustworthiness” emerge in markets. Knorr-Cetina and Bruegger note that seekers of information in particular must also be givers as traders “transmit and amplify signals of reciprocity” and while “all traders will be watching the same events and one another …. some also interact [trade] and in doing so implement a new level of signalling and responsiveness” [Knorr-Cetina and Bruegger, 2002; 925, 927]. This sense of reciprocity in markets is reinforced by codes of practice. In international foreign exchange markets, for example, they note that, if asked for a price, traders are expected to quote and, if you quote you are expected to commit to the quoted price if the counterparty wishes to trade. Conversely, traders are expected to offer deals on completion of price requests; failure to act after information search can lead to exclusion from information sources.

All of this generates and sustains access to networks. Baker’s classic pit-trading work illustrates the relationship between network membership and trading frequency. Knorr-Cetina and Bruegger [2002; 933] observe that even in electronic markets ‘information conversations are the means for the building and maintaining of relationships’. And membership has its benefits. Access to links to important actors allow traders to track the market – privileged information becomes available. From this perspective, noise trading risk is the cost of information access.

Certain trading strategies may be associated with noise trades. Zaloom [2003; 267] describes the operation of 'Spoofers' who generate large quantities of bids and asks in order to exaggerate levels demand and supply and so move the market. In turn, tailgating a Spoofer could be a profit making strategy by tracking the movement of the market. In the culture of the foreign exchange markets she studied, 'taking out' a Spoofer by calling his bluff generated reputational returns.

We can now return to the conventional finance theory views of noise. Noise trades should not take place if market actors are rational hence it is a term used to describe irrationality. However, agent traders and those who track market movements made by noise traders may be, in different ways, behaving rationally in noise trading. The origins of noise trading remain elusive and, in practice, the term is used as a 'dumping' concept to describe the considerable volume of trading activity the efficient markets approach cannot explain. Neither noise trading nor noise traders are coherently defined categories, they are simply different approaches to a large residual inexplicable in terms of a sociologically rather thin market conception. The behavioural finance project does not move us far from this; it simply adds sociologically unanchored heuristics to fit observed and anomalous aggregate trading patterns. Temporal and interpersonal sources of variation in the incidence of heuristic-based trading cannot be explained.

Sociological work on financial markets, however, allows a focus on how individuals in markets both reflexively make sense of their circumstances and also seek profit opportunities. It leads to identification of a number of social processes which might generate trading for reasons other than portfolio adjustment, liquidity or hedging. They have in common that the returns from trading are not measured solely by the return on the trade itself but in terms their contribution to the intellectual and social capital of market participants and thus are more likely to be indulged in by those who intend to trade in the longer term.

Noise trading risk is a behavioural component of the operating risk faced by investment banks. Power [2003; 2] has noted the close relationship [albeit, perhaps in retrospect] between the rise of the concept of operational risk and the behaviour of traders in financial markets – particularly Nick Leeson. Operational risk in investment banks is defined as “the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events [Power 2003; 7]. This is a peculiar notion of risk for investment banking for two reasons. First, it focuses on loss rather then variability of outcome; investment banks usually analyse both upside and downside. Second, as Power notes, it tends to be concerned with high impact low probability events. We argue that noise trading is a behavioural component of operational risk which arises because of the looseness of internal control processes on traders. However, since traders engage in noise trades to improve long term market performance, it has both upside and downside and their may be in principal an ‘optimal’ exposure to this form of risk in which the long term benefits exceed short-term losses. Second, we argue from the volume of noise trading that it is endemic rather than a low probability event. We will return in conclusion to discuss some of the practical implications of this view. First, we provide some background on the sample and approach, and present our data.

4. Methods and Data

The data presented here are extracted from a wider research project that considered individual and organisational influences on trader performance [Fenton O'Creevy et al, 2005]. Four London offices of major investment banks participated in the research. Three were American owned and one was European. Equity and bond trading, and the trading of derivatives of those products, were the focus of this study. All participants conducted their trading electronically. No open-outcry markets were involved. Participants were traders and their managers. The sample comprised 118 traders and trader-managers who completed a range of measures, outlined below, and 10 senior managers who participated only in the management interview section of the data collection process.

Semi-structured interviews were conducted with all respondents. Interviews addressed a range of issues, including motivations, emotions, trading strategies, and questions about organisational culture. They also included questions about control, incentives and management style, and the experience of gain and loss. Interviews averaged 1 hour in duration; they were taped and transcripts produced. The qualitative data presented here are based on analysis of the content of these transcripts. [i]

The approach to analysis was phenomenological, although some references are made to whether a type of comment reflected a majority opinion or not. Interview data were coded for analysis using the QSR NUD*IST Vivo (NVivo) program. The program enables sections of transcribed interview text to be coded and categorised. Each interview transcript was coded into categories developed to represent the key areas of interest in this paper using NVivo.

In addition we collected a range of quantitative data. First, participants completed a questionnaire covering a range of demographic data such as age and length of service and remuneration data [see Appendix 1]. Second, we asked participants to complete the NEO-PIR personality instrument, a widely used "Big Five" personality instrument [Costa and MCrae 1992; Digman 1997]. We did this in order to explore relationships between personality and risk behaviours. Third, illusion of control, a common source of cognitive bias, was measured by a computer-based task [see Fenton-O'Creevy et al 2003]. We were concerned to explore relationships between overconfidence and trading performance, given the salience of this issue in the behavioural finance literature [e.g. Odean 1999]

5. Results

Our approach to data presentation is as follows. First, we look at the nature of the agency relationship. We focus particularly on monitoring and incentives, showing the scope for agent noise trading and the circumstances which make it most likely. Second, we focus on specific circumstances which might encourage unnecessary trading; extremes of activity and inactivity appear important. Third, we look at specific trader characteristics, arguing that there may be individual differences in propensity to trade.

Traders were employed on permanent contracts. Job tenure was between 6 months and 30 years (M = 6.7, SD = 4.8). Years trading experience ranged from 6 months to 27 years (M = 5.1 yrs, SD = 4.15). There were minor differences between institutions but in general traders worked as part of loosely monitored teams [“desks”] focusing on particular trading instruments or sectors. Managers were generally ex-traders who operated with wide spans of control. Details of incentives differed between the four firms, but two features were common; the basic financial calculation, and the timing.

The calculative formula was a hierarchical system taking into account organisation, team and then individual performance. This formula was well known to the traders interviewed. However, each manager interviewed was asked to provide information concerning bonus calculation, and none were forthcoming with a specific procedure. In practice, there was latitude for variation both within and across organisations. Issues that could influence bonus-setting were contributions to the team, information sharing, standards of customer care and exposure to risk. The precise calculations of bonuses were unstandardised and individual with varying degrees of weight placed upon team and individual factors. The lack of clarity led some traders to develop trading strategies, which included risk exposure, based upon inferred hypotheses regarding payment calculations.

The second important characteristic of the bonus process was the timing of decisions. The organisations in this study completed bonus calculations before the end of the trading year: for example, in September when the trading year ended on December 31. Some traders perceived this as an opportunity to shift their strategy either towards taking more risk, or less. In total, 61% of the traders interviewed reported significant changes to their strategy over the course of the trading year. The managers in the sample were aware of the potential for traders' strategies to change, and reported that there were no significant problems associated with the bonus cycle. Moreover, it was recognised that this cycle is the industry standard and there could be first mover disadvantages association with making large scale changes to the process. There was wide earnings variation within the sample, from under £100,000 per annum to well over £500,000[ii]. Over half of the sample earned over £300,000 per annum [in 2000]

Figure 1 about here

Figure 1 summarises our findings on monitoring and incentives [see Willman et al 2002]. We discovered in interview that managers monitored trading when they knew losses were occurring but granted considerable autonomy when traders were in profit. This is consistent with a tolerance of risk aversion in the domain of gains, but a concern with the avoidance of risk-seeking loss aversion if trades went sour [Kahneman and Tversky, 1979]. Based solely on this intervention pattern, traders will not maximise returns but will minimise losses. The discipline of traders who are making money is the pursuit of bonus. Managers relied on traders pursuing profit - a share of which would accrue to them as agents - rather than intervening to ensure they maximised returns, a course of action from which they were prevented both by lack of detailed knowledge of trades and by extensive spans of control.

Two particular areas of managerial concern were in the zone 0B and the area above A. In the former case, managers were concerned directly to intervene in trades to minimise losses by directing the closure of positions. The distance 0B [i.e. the extent to which risk taking loss aversion occurred] is thus an inverse measure of managerial effectiveness. Above A, i.e. after traders had achieved their annual bonus targets, little discipline other than their own propensities for risk aversion or risk taking defined the number of trades a trader would engage in. This volume then depended on work conditions and individual differences; we look at these below. In short, any trader in our sample showing profit on trades and progress towards bonus target would have considerable opportunity to engage in experimental, educational or exciting trades in the course of a bonus year.

Towards the end of a bonus year, two pressures might cause increased trading volumes. The first is straightforward; traders falling short of their profit targets might engage in risky trades driven by loss aversion. The second is perhaps less intuitive. Although many traders who had hit bonus targets might become risk averse and avoid unnecessary trades, others appeared to envisage hitting the profit target as an opportunity for sensation seeking trades.

‘*Risk tolerance becomes infinite at the end of the year because we don’t have any personal exposure to our result in the last couple of months, we can almost become less discriminating in the trades we put on.’*

‘I think there is a certain comfort factor from having made money- your willingness to lose it is probably slightly higher.’

Why, then, would traders *choose* to trade ‘too much’? One option is that more frequent trading may follow from enthusiasm, of which there was considerable evidence. Traders were more likely to report trading more frequently when making money [and vice versa]. There were several examples.

“When I make money I think it shows I’m doing something right. If I’m right, I will try and do more of them, to increase the size of my position to make more money.”

“When you are getting things right, having a high hit ratio, then you can take a lot more risk. When you are losing money, you tend to think you are unlucky, but ultimately you are just getting it wrong”

“I think if you are on a roll, that is when you are prepared to put more money at risk. When you are not sure what is going on and you have a few losses that is when you pull back.”

“On average, people will trade more often when they are making money compared with when they are losing money because their risk aversion and loss tolerance change.”

Others had belief about relationships between trading volume and success.

“….turnover is usually important in my business. The more trades I do the better. If I do 1000 trades I’ll make more money than if I did 500 trades”

However we had no hard data on the relationship between trading frequency, risk exposure and success.

At the other extreme, it may be that excessive trading emerges from boredom, with trades initiated for essentially sensation-seeking purposes. One of our respondents described how boredom trades are generated.

“You do boredom trades because you can be sitting up there doing nothing and you think, well I’ll do that because it gives me something to do. The next

thing you know you are wrong and you've lost money on it. Or you're right and you're inclined to do it again in bigger volumes."

"A boredom trade is where someone might ask you a price and.. you haven't got anything to do , you don't know and you think you'll just sell for the hell of it and it proves costly"

Patt and Zeckhauser [2000; 46] identify "action bias" as "a general tendency towards action as a decision heuristic". They argue that it is likely in agency situations where imperfect monitoring occurs and also where individuals are seeking learning opportunities; they even identify "strong action bias" where individuals may prefer a combination of gains and losses to inaction. Add the sensation-seeking argument, that traders like to trade, and one has a motor for increasing trading frequency in slow markets.

I do enjoy risk. That's part of what I do. Its part of the job. I mean if you're not interested in taking risk then to be honest you're probably in the wrong job.

I thrive on taking risks in the sense that if the job I did didn't entail taking risks I wouldn't do it.

Networking and information sharing were problematic for our respondents because of the tendency for traders to wish to create or protect private information

"Everyone has the right to know arbitrage information, but people do not necessarily think it is their duty to share the information."

“This business is not about team spirit. We should be better at trading as a group … but in reality people get very parochial and very protective of what they’re doing.”

“If I didn’t know something and went and asked someone, this gives them bargaining power.”

Perhaps because of this, traders also emphasised the importance of learning from experience.

“To trade anything well, you need at least a year’s experience of trading that stock.”

“The year is a continuous progression of trading experiences.”

“You can never know enough and you can never learn too much.”

Several demographic factors influenced performance. Educational levels, tenure and trading experience are all positively associated with total earnings. Based on unstandardised regression coefficients, an increase of one educational level [e.g. from bachelors’ to masters’ degree] was associated with an increase in pay of £88,000 pa. An increase in tenure of one year is associated with a pay increase of £29,000 pa. An increase in experience of one year is associated with an increase of £19,000 pa. These characteristics of the ‘stock’ of traders in a firm may be important. If noise trading is partly about trading for learning, network building and information search, we might expect that more experienced traders would need to do less of it. We might also expect that traders who had been in the same job for some time might do less of it. There is some support in our data. If noise trading is inefficient, whatever its longer term functions, one would expect it to correlate negatively with performance outcomes.

Table 1 about here

In addition, we collected data on personality and dispositions. Personality factors appear to account for significant variation in earnings. The NEO factors – neuroticism, extraversion, openness to experience, agreeableness and conscientiousness are also included in Table 1. If we accept total earnings as a proxy for trader performance, the results suggest that the higher performing traders in our sample are emotionally stable introverts who are open to experience. Given the small size of our sample of traders with personality data (N=64) we have to be cautious about generalising from this result. However, the pattern makes sense.

The story would go as follows. Emotional stability immunises individuals against the stresses and strains of a job that places a premium on maintaining detachment in the face of large gains and losses. Introversion insulates traders against social distractions including the need to be liked and accepted: useful especially where there is a need to seek or tolerate contrarian positions. Finally, openness is associated with intelligence and ability to adapt to fast changing environments.

The Illusion of control is the tendency to act as if chance events are accessible to personal control (Langer, 1975). It has been found empirically to link with a tendency to perceive situations as less risky than they actually are (Houghton et al., 2000), and in consequence to take greater risks. We find that it has a significant and negative impact on performance as measured by remuneration [Table 1]. As reported elsewhere, we also found that it was negatively associated with managers rating of traders' risk management and market analysis abilities [Fenton O'Creevy et al, 2004]. We argue that illusion of control is associated with overconfidence which in turn may lead to overtrading and underperformance.

Figure 2 about here

In Figure 2, we summarise our general findings. Our analysis implies that in order to predict the level of noise trading in a given firm at a point in time, one would in addition to the market conditions need to look at both the characteristics of the stock of traders and the organisational control and incentive regimes to which they are subject [McNamara and Bromiley, 1997]. For an organisation operating within a market, noise trading risk can be reduced by paying attention to selection testing, monitoring [including training of managers] and rewards. Any trading desk might be considered as a portfolio of operational risk defined by the personality and dispositions of traders on the one hand and the freedom to act on them on the other.

An agency approach may not be sufficient in itself to explain excess trading in financial markets but it is certainly a necessary ingredient given the volume of such trades originating in large firms using trader agents. Dow and Gorton have a simple but at based limited model of the agency relationship as a risk generator in which agents are forced to act. Focusing on the risk bearing behaviour of agents who are not closely monitored and whose appetites for risk may vary gives a richer picture. Large investment banks are complicated vehicles for the management of risk and the operation of heuristics but they do not appear as actors in much of the behavioural finance literature. Our argument is that the market anomalies which appear to generate risk behaviour incompatible with the efficient markets hypothesis – such as noise trading - may be better understood by analysing social relationships within the largest institutions in the market than by using individual biases as the sole unit of analysis.

6. Conclusions

Financial institutions are producers, processors and managers of risk. Even their own risk management products – such as derivatives for hedging – become profit generating products and on occasion, as in the LTCM case, cause major problems. The pursuit of risk is the source of profit and the management of risk is concerned with the avoidance of loss.

Financial institutions engage with risk by trading in markets. These markets are global, virtual institutions involving great uncertainty. The traders are skilled organisational agents operating under loose controls and considerable incentives who seek to survive and profit by making sense of this market uncertainty, often by attaching meanings to observed price movements in a very short space of time. One could, relying simply on the cognitive bias literature, argue that these organisational environments are from one viewpoint factories for the manufacture of imperfect decision heuristics – confident experts acting under stress with the prospect of considerable gain and loss. However, to understand the incidence and distribution of these heuristics one needs to situate traders decision making within the organisational agency context.

The existence of noise trading ostensibly shows large scale irrational risk taking operating in the market. This is a form of operational risk for banks, but we have argued that for traders it is a necessary form of risk exposure. Frequent trading allows traders opportunities for learning, sensation seeking, information search and network building. However, to the extent that they trade in order to do this, they expose their firms to higher levels of operational risk. In consequence, in making decisions about how these traders are selected, monitored and rewarded financial institutions are in practice defining their own appetites for risk. A portfolio of traders with differing risk propensities contains operational risk in approximately the same way as a portfolio of assets contains market risk.

In our view, noise, in its financial economic sense of normatively irrational trading activity becomes a highly problematic concept once one takes a broader view of rationality. However, it has utility in at least two senses. First, if traders are trading for non-financial motives then they do bear risks in doing so and those risks accrue to the firms they work for. Second, if traders trade in pursuit of long term advantages then they bear risk in pursuit of those advantages and those risks need to be understood

What are the broader implications? First, our approach sees organisations as risk makers as well as risk takers. In financial markets, large organisations make decisions which strongly influence the overall level of risk in the market. This may be true of other fields and emphasises the importance of using the organisation as a unit of analysis in the study of risk. Second, we have seen the nature of agency relationships within organisations as influencing the organisation's risk appetite; were traders not on bonus, we would argue, financial markets might operate very differently. Third, we have looked at the interaction between organisational controls and individual dispositions; this approach emphasises the role of individual differences in explaining risk behaviour, particularly in the spaces between the rules with which organisations seek to control risk.

A trading environment consisting of organisations that both enable and control trading agents who operate with considerable autonomy to develop profit strategies in highly volatile environments is, we would argue, a more accurate picture of the mechanisms generating high trading volumes than imagining individuals failing to behave according to price-taking rationality. Financial markets are empirically complicated social environments in which information is generated, decoded and used in a wider range of categories than 'news' and 'noise'. If we are to understand more fully the generation and management of trader risk in market environments, this richer and more complicated reality needs to be better understood.

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Table 1 Regression on total remuneration

	Standardised regression coefficients	
Experience[1]	.44	**
Job level[2]	.36	**
Education[3]	23	
Illusion of control	-.28	*
Neuroticism	-.42	**
Extroversion	-.28	*
Openness	.41	**
Agreeableness	-.23	
Conscientiousness	-.05	

* p<.05, ** p<.01, ***p<.001

Notes

1. Job tenure in trading
2. Levels to CEO in the London Office
3. Highest qualification

Figure 1: Introducing incentive and monitoring effects to prospect theory description of risk behaviour

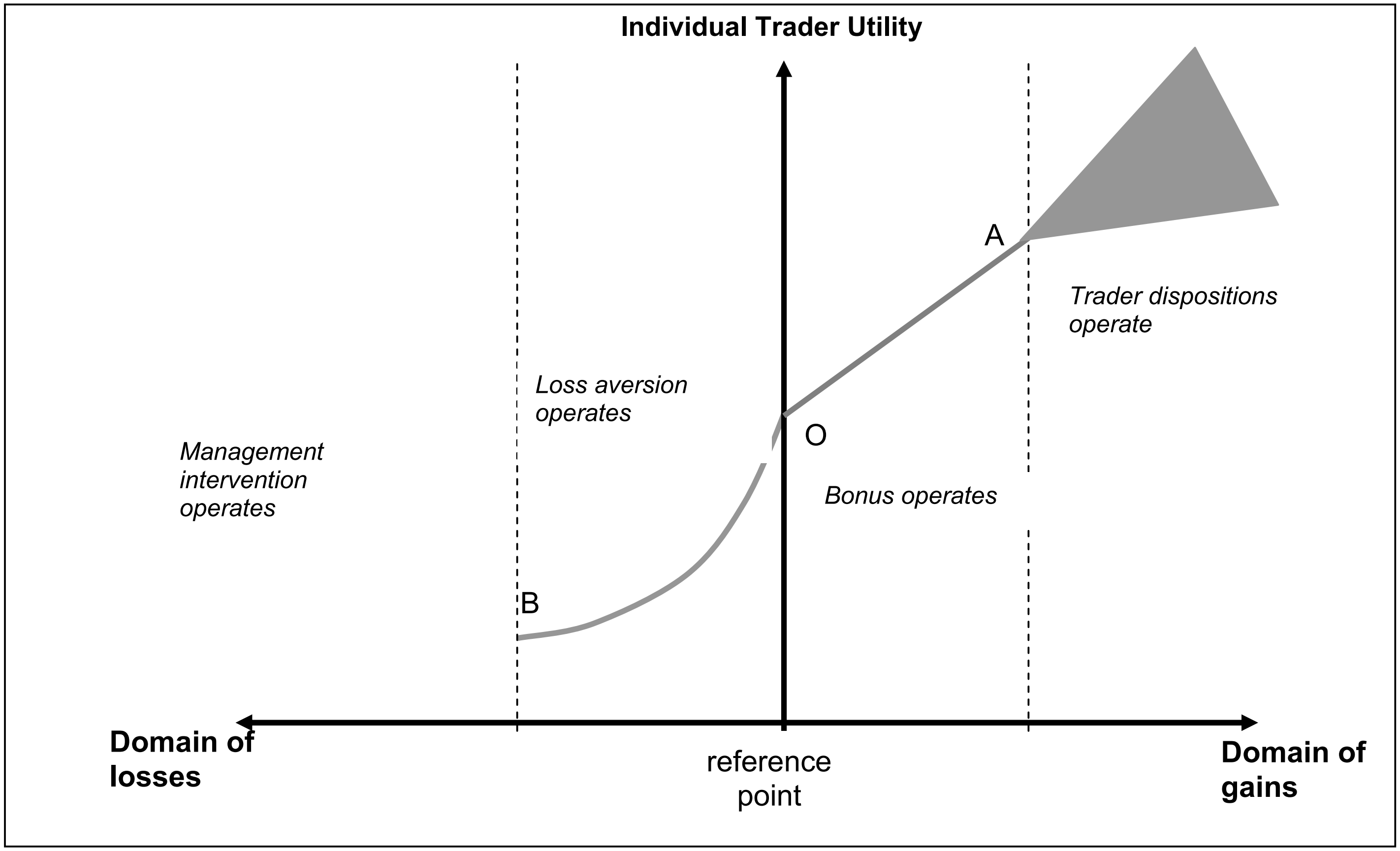
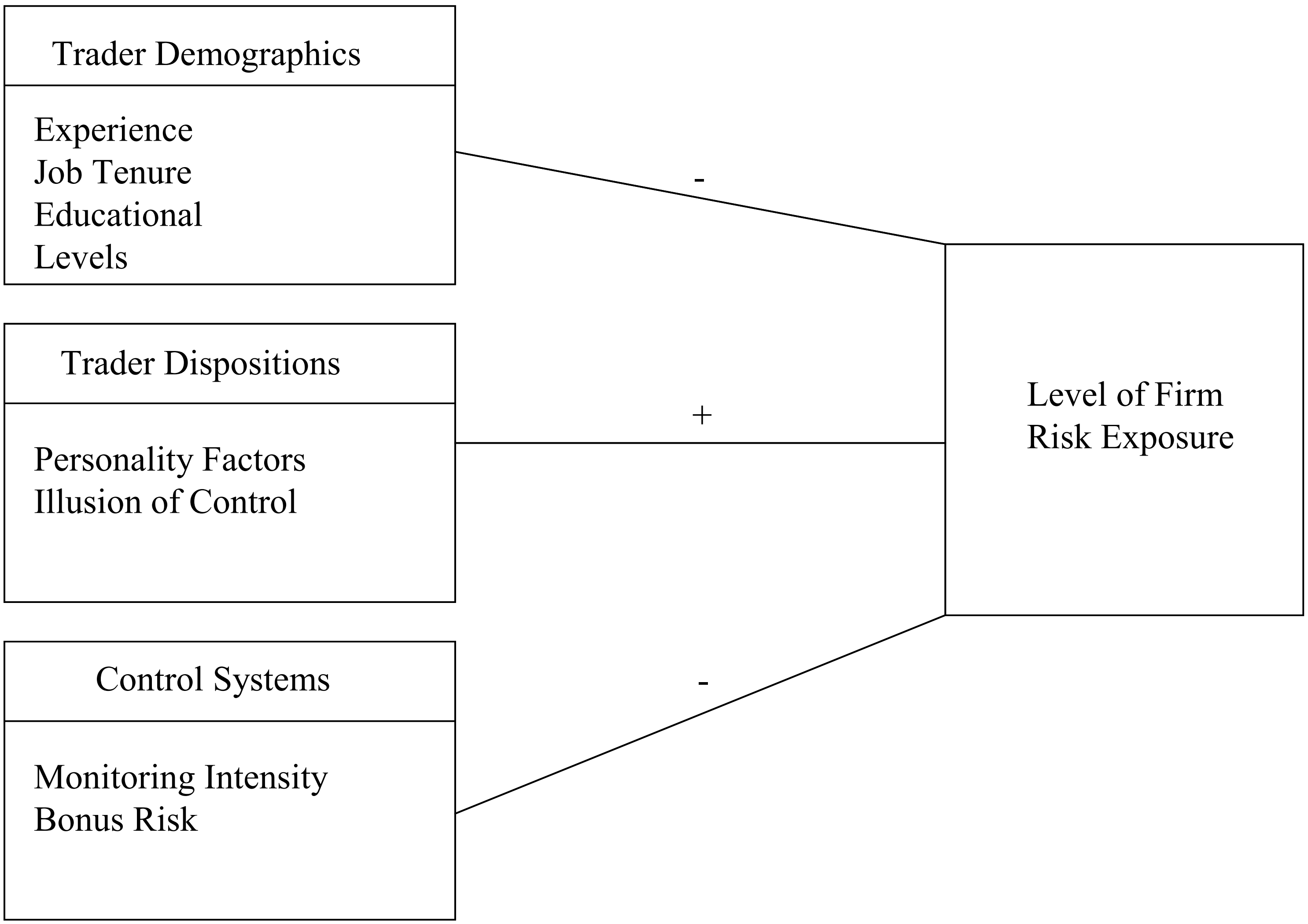


Figure 2: Noise Risk Exposure



Appendix: Investment Bank Sample Profile

	Firm A	Firm B	Firm C	Firm D	Total sample
Sample size (N)	38	32	23	25	118
Senior managers interviewed	3	1	5	1	10
Age (mean years)	33.8	30.91	32.87	33.80	32.81
Mean Job tenure (years)	6.18	6.11	4.74	10.08	6.71
Mean Organisation tenure (years)	7.18	6.67	6.57	11.30	7.80
Traders	13	22	11	11	57
Trader/managers	23	10	11	2	46
Desk managers	2	0	1	12	15
Male	38	31	22	25	116
Female	0	1	1	0	2
Education (highest qualification) (N)					
O-Level/GCSE	1	2	1	16	20
A-Level	2	4	3	5	14
HND/equivalent	1	3	2	0	6
Degree	9	13	8	3	33
Masters	16	6	6	1	29
PhD	9	4	3	0	16
Seniority: Levels to CEO in the London office					
1	3	6	1	3	13
2	16	15	3	15	49
3	15	7	9	3	34
4	4	4	9	0	17
5	0	0	1	2	3
6	0	0	0	2	2
Salary, including bonus for the year end prior to the study					
£50k –99k	0	3	1	0	4
£100k – 299k	9	13	5	14	41
£300k – 499k	7	6	12	9	34
> £500k	21	10	5	2	38
Not divulged	1	0	0	0	1

[i] The interview schedule is available from the first named author on request.

[ii] These data exclude stock options.