

**Institution:** The Open University

**Unit of Assessment:** C19 Business and Management Studies

**Title of case study:** Improved decision-making for traders and private investors in financial markets

### 1. Summary of the impact

Research from the Open University Business School (OUBS) on the practices of traders and the link between emotions and financial decision-making has underpinned developments in a new client education platform at a leading European bank, Saxo Bank. The bank has created training tools to support improvements in client decision-making and trading and made these available on its public portal to its own clients and the public as part of its value proposition. The research has also led to development of the BBC Lab UK *Big Money Test* which was featured in the BBC television series *Watchdog*. The research is influencing policy makers in the UK and internationally and has been instrumental in the formation a new private-sector firm.

### 2. Underpinning research

The underpinning research is part of a sustained stream that started at OUBS when Professor Fenton-O'Creevy joined in 1997 and has continued and developed to the present. The research shows that emotions and their regulation play a central role in traders' decision-making and performance, whether professionals employed in financial institutions or private investors.

The research located at OUBS commenced with Professor Fenton-O'Creevy's analysis, theory development and publication of key outputs based on data that had been collected whilst at London Business School. A number of linked outputs explored and demonstrated the impact of particular emotion-driven biases and emotion regulation approaches. For example, Professor Fenton-O'Creevy found an inverse association between propensity to illusions of control (a bias arising from avoidance of negative emotion) and sound financial decision-making. It has also shown that there are differences between high and low performing traders in the strategies that they adopt for emotion regulation and that these have material consequences for trader behaviour and performance. His research found that traders deploying antecedent-focused emotion regulation strategies perform better than those employing primarily response-focused strategies.

Later research, undertaken at OUBS, combined physiological measures with the previous methods of interviewing, observation and analysis of biographical data. The heart rate of professional traders during trading in changing market conditions was measured, and Professor Fenton-O'Creevy and colleagues found a significant inverse relationship between high frequency heart rate variability (HF HRV) and market volatility and a positive relationship between HF HRV and trader experience. This suggests that emotion regulation is an important facet of trader expertise and that the learning effects demonstrated in financial markets may include improved emotion regulation as an important component of that learning.

Since the financial crisis in 2008, the research has been extended to study the role of emotion regulation in the financial decision-making of private investors in the stock market. A major part of this work has been undertaken by means of an EU-funded project called 'eXcellence in Decision making through Enhanced Learning in Immersive Applications' (xDelia: €3.2m FEC; €1m for OU). This project developed a technology-based learning intervention, called the xDelia Learning Pathway, based on a range of technologies, including wearable bio-sensors and serious games. Drawing on the findings of the earlier stream of research, the Learning Pathway builds awareness of emotions and develops emotion regulation skills aimed at improving financial decision-making. This intervention is suitable for both professional traders and private investors. Saxo Bank is a collaborator in xDelia and has contributed to the development of the online tools to aid investment decision-making by its clients.

### 3. References to the research

Authors shown in bold are Open University Business School staff.

- i. **Fenton-O’Creevy, M.**, Nicholson, N., Soane, E. & Willman, P. (2003) ‘Trading on illusions: unrealistic perceptions of control and trading performance’, *Journal of Occupational and Organizational Psychology*, 76(1), pp 53–68 online at <http://oro.open.ac.uk/1317/> (Quality indicator: ABS 4\*)
- ii. **Fenton-O’Creevy, M.**, Nicholson, N., Soane, E. & Willman, P. (2004) *Traders: Risks, Decisions and Management in Financial Markets*, Oxford: Oxford University Press. (Quality indicators: high-quality publisher with substantial sales – Hardback: total 1,851; Paperback: total 1,153)
- iii. Willman, P., **Fenton-O’Creevy, M.**, Nicholson, N. & Soane, E. (2006) ‘Noise trading and the management of operational risk; firms, traders and irrationality in financial markets’, *Journal of Management Studies*, 43(6), pp 1357–74 online at <http://oro.open.ac.uk/10040/> (Quality indicator: ABS 4\*)
- iv. **Fenton-O’Creevy, M.**, Soane, E., Nicholson, N. & Willman, P. (2011) ‘Thinking, feeling and deciding: The influence of emotions on the decision-making and performance of traders’, *Journal of Organizational Behavior*, 32(8), 1044–1061. doi: 10.1002/job.720 online at <http://oro.open.ac.uk/31984/> (Quality indicator: ABS 4\*)
- v. **Fenton-O’Creevy, M.**, Lins, J., **Vohra, S.**, **Richards, D.**, **Davies, G.** & Schaaff, K. (2012) ‘Emotion regulation and trader expertise: heart rate variability on the trading floor’, *Journal of Neuroscience, Psychology and Economics*, 5(4), pp 227–37 online at <http://oro.open.ac.uk/34212/> (Quality indicator: Published by the American Psychological Association, Impact Factor 1.89 and H index of 5 would put this equivalent to ABS 3\*/4\*)

### Grants

2009-2012: €3.2m; €1m for OU awarded by EU to a consortium of 7 institutions with the OU contribution led by M. Fenton-O’Creevy for the project entitled ‘eXcellence in Decision making through Enhanced Learning in Immersive Applications’. and ‘xDelia Final Report: Emotion-Centred Financial Decision Making and Learning,’ Open University: Milton Keynes, UK. Online at <http://oro.open.ac.uk/34544/1/Final%20report%20-%20publishable%20format.pdf> and [www.xdelia.org](http://www.xdelia.org).

### 4. Details of the impact

This research filled an important gap in knowledge about the links between emotions, emotion regulation and performance in financial decision-making. Poor financial decision-making, by both professionals and private investors, has been identified as a key contributor to the 2008 financial crisis, and the long-term and profound damage of that crisis demonstrates the importance of these failures. This research has made an economic impact for an individual bank and a widespread social impact through improving the awareness and skills of individual investors and financial consumers.

A major commercial impact of the research has been on the European online bank, Saxo Bank (<http://www.saxobank.com>), which was also a partner in the xDelia research. As an online bank, an important part of their client attraction and service is via their online TradingFloor.com. Outputs of Professor Fenton-O’Creevy’s research, particularly the outputs from the xDelia project, have been included in a dedicated educational section of TradingFloor.com called ‘Train Your Brain’ (evidence 1 below). This section presents the findings of the research as a two-part, online resource titled ‘The Emotions and Trading Biases Course’, which includes:

- an online questionnaire developed by Professor Fenton-O’Creevy and collaborators that allows users to identify their emotional biases when making financial decisions; feedback on the questionnaire is provided via videos designed by Professor Fenton-O’Creevy and Saxo Bank in the xDelia project so that individuals are made aware of their own biases;
- a diagnostic online game based on the findings of the underpinning research, providing further

insight into users' emotional biases.

The Train Your Brain web pages explicitly reference the input from Professor Fenton-O'Creevy's xDelia project, provide the summary to the xDelia final report and refer users to the xDelia project website. Saxo Bank's TradingFloor.com portal has a broad reach, being available to the bank's customers and the general public, and has over 6,000 registered users (as of Dec 2012). The Bank views the provision of 'Train Your Brain' and the 'Emotions and Trading Biases Course' as important in supporting the development of their clients, and sees them as a significant part of the educational and development offerings to both of these groups, and as part of their customer satisfaction and retention strategy. The Head of Research and Innovation at Saxo Bank stated:

'Professor Fenton-O'Creevy's collaboration with Saxo Bank through these several years has been very valuable to us in several ways. In general, his knowledge and insights concerning the psychology of trading and investment has helped the bank target new areas of focus and craft tools and processes for approaching these areas. Through formal research and many important discussions, Professor Fenton-O'Creevy has helped the bank to develop ideas concerning investor education and training of its employees and to put together client-facing resources that represent part of the bank's value proposition. This contribution has helped provide a foundation and framework that the bank continues to build upon.' (2).

The underpinning research has also led to significant social impact. Professor Fenton-O'Creevy has worked with Prof Adrian Furnham (UCL) and the BBC's Lab UK to produce *'The Big Money Test'*. This online test, which is hosted on the BBC's Lab UK website, invites members of the public to participate in an in-depth (20 mins) questionnaire about their emotions and financial decision making. They then receive customised feedback in the form of videos recorded by Martin Lewis (of [moneysavingexpert.com](http://moneysavingexpert.com)), which are based upon the underpinning research (3). These videos explain the practical meaning of key elements of their results and offer tips on management of personal finances. This interaction and personalised feedback ensures a move beyond widespread public engagement to social impact on the understanding and skills of individuals. Further interest in *The Big Money Test* has been generated by its being featured on the BBC's peak-time consumer affairs programme, *Watchdog*. *The Big Money Test* has had considerable reach, with over 109,000 participants (as of April 2012).

The underpinning research also provided the basis for Professor Fenton-O'Creevy's role as an Academic Advisor for BBC2's documentary on the causes and ramifications of the financial crisis, titled *Love of Money* (2009). This role involved providing academic and research guidance to the production team and overseeing the provision of supporting resources, which are usually provided online. The series had an average audience of 1.3 million per episode and an audience appreciation measure above the BBC average (4). Similar to other programmes co-produced by the OUBS with the BBC, this series attracted a wider demographic mix than other specialist programmes, including groups identified by the BBC as hard to reach. The programme also had a higher than average proportion of viewers accessing the supporting online materials, again demonstrating that the programmes and their support resources go beyond general public engagement and achieve impact at the individual level.

Further social impact has been generated through the production of a podcast on iTunes U titled *Money and Emotions*, which has been downloaded over 21,000 times. Professor Fenton-O'Creevy has also authored two series of articles for *The Telegraph* Business Section, both discussing the role of emotions in financial decision-making and trading.

More recently, the underpinning research has had an impact on both UK and international policy makers through invited meetings and presentations. Professor Fenton-O'Creevy gave an invited presentation at the OECD Investor Education Conference on recognising the role of emotions in investor education (3–4 Feb 2012, Goa, India). Following personal invitations, Professor Fenton-O'Creevy provided invited input into the financial education strategy of the UK's Money Advice Service. He also was invited to meet the New Zealand Government Commissioner with responsibility for Financial Literacy and Retirement Income. The Commissioner commented after the meeting

'Thank you very much for sharing the information about the xDelia project. Our office has used the

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information to help develop our thinking regarding our financial literacy programme.' (5)

Professor Fenton-O'Creevy also met with officials from the Central Bank of Brazil (Feb 2013) who subsequently included findings from the research in training events they ran for their staff in the Central Bank and for the Executive of the Brazilian National Strategy for Financial Education (6).

Professor Fenton-O'Creevy's research findings have also been instrumental in the formation and development of the firm Essentia Analytics Ltd (7), to which he was invited to join the Advisory Board in May 2013. Essentia Analytics develops tools and coaching approaches based on behavioural approaches to financial decision-making to support the performance of fund managers and other professional financial decision makers. The CEO of Essentia has said:

'Professor Fenton-O'Creevy's work bridges a crucial gap between Behavioural Finance theory and its application. In our quest to help professional investors make more skilled investment decisions, we draw upon it gratefully and usefully.' (8)

**5. Sources to corroborate the impact**

1. Saxo Bank's trading platform that offers investors the opportunity to use the serious games developed by Professor Fenton-O'Creevy as part of the xDelia project (see references to the research for grant details) is online at <http://www.tradingfloor.com/topics/train-your-brain>
2. Personal email from Head of Research and Innovation at Saxo Bank – available on request.
3. BBC Big Money Test online at <https://ssl.bbc.co.uk/labuk/experiments/money/>
4. Independent measure by GfK NOP on behalf of the BBC – can be substantiated on request.
5. Personal email from Retirement Commissioner, Commission for Financial Literacy and Retirement Income, New Zealand Government – available on request.
6. Personal email from Brazilian International Association for Research in Economic Psychology – available on request.
7. Profile of Essentia Analytics in FT.com stating, 'The technology, to be launched this week, has been developed by Essentia Analytics with the help of psychology and human behaviour experts as well as computer and software specialists', is online at <http://www.ft.com/cms/s/0/8dfc834c-1ddf-11e3-85e0-00144feab7de.html#axzz2eyiRC700>
8. Personal email from CEO of Essentia Analytics Ltd – available on request.