PERCEPTIONS, BELIEFS AND ACTIONS

Olivier Oullier, a renowned expert in behaviour change and neuro-economics, explains how research developments in brain sciences and behavioural finance help us comprehend the biases that distort financial and economic decisions and how investors and traders can better understand and cope with such problems.

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At first sight, my profile may seem a bit unusual with respect to finance: I have a background in complex systems and then moved into psychology and neuroscience, with a particular emphasis on how we make decisions and what is going on in our brains. I work as an academic professor/researcher and I advise public and private institutions on how to develop prospective or crisis management strategies based on what we know about the human brain and behaviour dynamics.

The investor's chief problem – and his worst enemy – is likely to be himself, yet we have a strong tendency to blame our mistakes on information or others. A strong belief, rooted in standard economics and its models of rational decision-making, is that a person will use information to make the right choices after making an informed judgement, balancing rights and wrongs, pros and cons, costs and benefits, etc. But people do not behave in this way. Real human beings behave very differently from the artificial economic agent that is still at the heart of most decision-making models today.

Behavioural finance draws on cognitive and social psychology to analyse dozens of psychological biases that influence how we process and use information to make choices. But we can now go further by using neuroscience to analyse how our brains function in the decision-making process. I am not here to sell you the perfect solution; anyone who would claim that brain sciences alone can provide the perfect strategy, regardless of the field (economics, finance, marketing, management), would be at best misinformed, if not lying. The main advantage of learning about what we know about behaviour and the brain in finance is to avoid mistakes, to avoid repeating mistakes and perhaps to develop insights that complement and, sometimes, supplement traditional financial theories and tools in understanding what is at play when making decisions.

For example, we are all overconfident. Many of the decisions we make every day in our jobs are related to things that we are used to dealing with. But even if we have no idea about something, no background or train-

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For instance, we have a powerful aversion to loss: if you ask people whether it is more painful to lose money or to earn money, of course people prefer to earn money – and yet loss-aversion can make them reluctant to cut their losses when it would otherwise make sense to do so. When we look at brain data, it appears there are two distinct dynamics that are employed when we compute what we can gain and what we can lose. Besides, when people are in loss-aversion mode they rely more on the brain networks that deal with fear.

There is also herding, our tendency to mimic or follow what other people do. If you want your employees to do something, telling them that almost everyone they know does it is much more effective than telling them it is the right thing to do. In the UK, Her Majesty's Revenues & Customs (HMR&C) did an experiment with letters sent to citizens informing them of the percentage of people who pay their taxes on time compared to traditional reminders. This strategy increased significantly the number of people who paid their taxes on time.

Our tendency to herd might come from our strong tendency to mirror others. We have brain cells called mirror neurons that fire whether one is performing an action or seeing someone else perform the same action. And if someone is performing an action that you are thinking about, you somehow start to resonate with the person and might even mimic that action spontaneously; this is what is at the heart of herding behaviour.

Some of the most common biases are listed on page 26. There are many others. Any or all of them may distort how we process information and reach decisions; we are living in a jungle of biases that we have to navigate and endure.

Over the past 20 years, incredible machines have been developed that allow us to look into the brain and see how it processes information. This does not stop us from being fooled, and it overlooks the role of knowledge in making decisions. If I flip a coin, plot the results and ask whether there is a pattern, most people from outside finance would detect one from the visual representation of the distribution between heads and tails. When I ask people working in finance or economics, knowledge manages to control information and they rightly say there is no pattern. Our certainties can fool us. Being informed is necessary, but usually not enough to counter biases.

Also, looking at the brain on its own is not really useful. For cognitive neuroscience to be useful in finance, one needs to pay equal attention to the brain and to the information exchange in and outside of it. This exchange occurs within the brain, between the brain and the body (thanks to the nervous and hormonal systems) and the brain/body and the physical and social environments. Add on top of this our changing emotions, our history and experiences, as well as our future – which, at least temporarily, is represented by our intentions – and we are dealing with the most complex, adaptive and information-sensitive system ever.

In order to make a decision you may want to make a representation of what is going on in your brain and the environment. You select an action and you act, and, after, you can evaluate and learn. Of course we do learn, but when you look at most of the literature in economics and finance, the word learning is not so common. It is barely considered.

Looking deeper inside the brain, we see a reward system is at play, as is a kind of 'neural currency': a neuro-transmitter called dopamine that plays a key role in the functioning of this system. The reward system is what makes us feel good, whether we are expecting to reach a goal, waiting for it or achieving it.

Behaviour can also depend on the level of hormones in the body – a trader's morning testosterone level can predict his profitability for the day. A commonly held belief is that more testosterone leads to less rational behaviour, leading some to suggest that hiring only female traders would mean fewer problems. However, as volatility in markets, stress, reward and many more behavioural and biological factors are at play, this is unfortunately not that simple.

A final example of what we can learn from brain research relates to trust. Experimental settings have revealed that, in contexts where people exchange money and trust evolves throughout these exchanges, the brain networks in charge when making these decisions can see their peak activity evolve with time. The more

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we know people, the more activity in these areas of the brain peaks. Thanks to neuroimaging there is evidence that when people first interact, the evaluation of the decision to invest money occurs after another individual invested. As people interact with each other, the brain switches from reactive mode to anticipation mode, as we can see the brain network supporting the decision is active before knowing how much the other one invests.

This casts light on how people have a tendency to trust the market too much and make decisions even before they have all the information. Anticipation can be a great asset, but it can be a disaster as well.

So what are the challenges for researchers and people in finance? We understand a lot more about human behaviour, our biases, how our beliefs can mess up our judgement and how this judgement can influence decisions. But the true dynamics between the individual and the collective level remain very hard to evaluate, and we do not yet have efficient models to connect them. Yet, brain sciences have provided unprecedented insights into how judgement and decision-making can be processed differently in the brain. Such findings hint at the reasons why people very often make poor decisions in spite of having a clear judgment of a situation. On top of that, the intrinsic dynamics and emerging self-organised technical patterns of a market can disturb or stabilise behaviour as much as external information can, contrary to efficient market theory.

Another challenge is that most of the experiments are conducted in labs, on Western-educated students on campuses in democratic, industrialised countries. As a result, they are not universally representative, and the context is not very realistic. The insights could be totally wrong if applied to a global population. This is why I do a lot of work with subjects who work in financial institutions rather than students on my campus. We have also developed new techniques of data mining and crowd sourcing for large-scale analyses and new portable neuroscientific devices that can be used in workplaces unobtrusively so we can establish more sound general insights.

Thanks to our growing knowledge of cognitive biases and how the brain works, we know that we will not deliver perfect solutions. But if we can train people to identify their biases, they could identify very complicated days when the stakes are really high and they could assess whether or not they are ready to deal with them. People will have to learn how to say that, for example, someone is dying in a person's family – and the people in charge will have to learn to accept that such occasions can totally flip that person's ability to deal with major crises. ●

- **Anchoring**: We rely too much on previous information, regardless of its accuracy. The effect can be multiplied if we hear the information from someone we respect a lot or someone we totally despise.

- **Negativity bias**: When weighing options we put more weight on negative factors that are painful, not only financially but in terms of ego.

- **Illusion of control**: We overestimate our ability to influence events. If we miss a day at work and some stocks dive, we tell ourselves that, if we had been at work, it would have been different.

- **Priming**: The way that we process and use information depends on who gives it to us.

- **Observer expectancy effects**: If we are convinced that something is right, that will influence the way we process information. In the models we use, the way we interpret information and the people we rely upon, our choices reflect our strong beliefs.

- **Endowment**: Because we bought something, we value it more. We will be less reluctant to sell something that we did not buy.

- **Backfire effects**: We evaluate people according to whether they say what we want to hear. We downplay them if they go against our views and it may even strengthen those views.

- **Gambler's fallacy**: We believe that previous events have a strong influence on what is going to happen, even if they are totally unrelated.

- **Hyperbolic discounting**: We prefer a gain that arrives sooner rather than later.