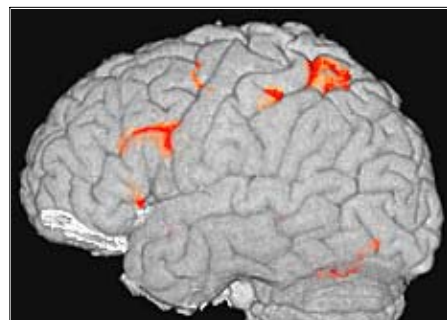


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Studying how a broker's brain works



To help maintain its competitive edge, the Swiss banking industry is investing heavily in financial engineering. Its latest recruit is economist Peter Bossaerts.

Bossaerts' neurofinance research aims to better understand how we make choices in a risky world (unil.ch)

swissinfo talked to Bossaerts, a leading expert in neuroeconomics – the study of how we make financial choices - about his recent appointment as professor at the Federal Institute of Technology in Lausanne.

The American, who also teaches at the prestigious California Institute of Technology (Caltech), says he is moving to Lausanne for the "excellent research opportunities".

Most of his research is undertaken with neuroscience specialists in Europe – in Cambridge, London and soon in Dublin. By next year Europe is expected to become a major centre for this field of study.

swissinfo: So what exactly is neuroeconomics?

Peter Bossaerts: It's a mixture of decisional theory - mathematical theories applied in risk-based decision-making - and neuroscience.

In finance or business, the crucial thing up to now was how people behaved. We studied how business people made choices to work out their rational preferences. Often, however, choices were not only made based on preferences but also on bias and errors.

Financial risk is a very special field. It's perhaps the most unpredictable area of risk, not at all related to everyday risks. Ever since the first stock markets were established in the 15th century, our brains have not had time to adapt.

Neurofinance, therefore, tries to understand how choices are made in a risky world. It looks closely at the workings of the brain while taking into account human emotions.

In behavioural finance, we assume that emotions disturb financial decision-making. Neurofinance rejects this conflict between emotion and rationality. Emotion can be a key element of rationality. For example, whenever we take risks we need a certain level of predictable emotion.

swissinfo: What is the aim of your work?



Peter Bossaerts (EPFL)

P.B.: Firstly, to make progress on how people make choices when dealing with risk. Where are the errors of calculation? Is it possible to develop tools to help people take better decisions and stop them getting too emotional, for example?

The other is to better understand what happens in the brain when it is subject to various medicines that react with dopamine or serotonin, for instance.

Neuroeconomics should also help improve decisional theory, which doesn't work in the real world where rules are vague and probabilities are unknown. The aim is to build up artificial intelligence based on a theory where decision-making is repeated.

swissinfo: How do you carry out your research?

P.B.: The easiest aspect is scanning people's brains using magnetic resonance imaging and encephalography [the radiographic representation of the brain].

You can go much further by carrying out research on mice that are subjected to risks similar to financial risks. The advantage is that you can better study neuronal activity, especially if their brain isn't fully functional.

Pharmacology is another possibility, looking at whether it's possible to influence people's choices using certain medicines.

There is a rich future for this field, as there are many links between financial decision-making and addictions to gambling, cocaine, amphetamines and other things. They use the same parts of the brain.

One day it might be possible to understand certain addictions and psychiatric problems thanks to financial decision-making theory.

swissinfo: What's the importance of this kind of research for Switzerland?

P.B.: The private fortunes of many of the people on this planet are managed in Switzerland. Each portfolio is based on a client's choices, but in reality we don't know what they are.

The client is asked questions and told to make a hypothetical selection to try to find out what their preferences are. But what happens if part of this selection reveals errors of calculation?

In other words, you have portfolios combining a client's preferences and their biased calculations. You have to be able to distinguish one from the other. That's where we hope to help the Swiss banking industry over the next few years.

swissinfo, based on an interview in French by Pierre-François Besson

PETER BOSSAERTS

Peter Bossaerts, who recently joined the Federal Institute of Technology in Lausanne as a professor, is an expert in empirical finance.

He is a professor of economics and management and professor of finance at the California Institute of Technology (Caltech) and research fellow at the Centre for Economic Policy Research in London. He is also the chair of Caltech's Division of the Humanities and Social Sciences.

The 47-year-old has distinguished himself through his scientific contribution to general finance and through his expertise in financial asset allocation theory, business management and behavioural finance.

CONTEXT

Financial engineering is a process involving the creation and combination of a variety of financial instruments to achieve a defined financial objective within certain cost, tax and legal constraints, e.g. combining or dividing existing financial products to create new financial products.

Financial engineering is seen as a key discipline for the Swiss economy, which depends heavily on its banking and financial centres.

The Swiss Finance Institute was set up in 2005 by the Swiss banking and finance community together with several Swiss universities. The institute aims to become a leading research centre for banking and finance.

The Federal Institute of Technology in Lausanne plans to start a postgraduate course in financial engineering next year.

LINKS

- Federal Institute of Technology, Lausanne - press release on Bossaerts' appointment (French) (<http://actualites.epfl.ch/presseinfo-com?id=472>)
- Federal Institute of Technology in Lausanne (<http://www.epfl.ch/index.en.html>)
- Peter Bossaerts' CV (<http://www.hss.caltech.edu/~pbs/Bossaertsvita.pdf>)
- Swiss Finance Institute (<http://www.swissfinanceinstitute.ch/home.htm>)

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