Research funding has become prone to bubble formation

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Fashions in research funding, reward structures in universities and streamlining of scientific agendas undermine traditional academic norms and may result in science bubbles. Research from the University of Copenhagen, which has just been published in the journal Philosophy and Technology, shows how the mechanisms that set off the financial crisis might be replicating in the field of science.

"In finance, the first condition for a bubble occurs when too much liquidity is concentrated on too few assets. The second is the presence of speculators. In science, similarly, if too much research funding is focused on too few research topics, and all researchers speculate in the same fashionable scientific templates to attract funding, a potential science bubble may be forming," explains professor of Formal Philosophy Vincent F. Hendricks from University of Copenhagen.

In the article "Science Bubbles" just published in *Philosophy and Technology*, professor Vincent F. Hendricks and postdoc David Budtz Pedersen trace the mechanisms that can result in science bubbles. They point to the past decade's massive investments in cognitive neuroscience as a potential bubble – culminating with President Obama's recent endorsement of the one billion dollar Brain Activity Map Project and the European Commission's 500 million euro Human Brain Project.

"These investments have been preceded by a dramatic rise in fields that attach 'neuro' to some human behaviour or trait with promises that the techniques of neuroscience will explain it – and into game-changing

explanations of the human mind," Budtz Pedersen says and adds that studies have shown that peer reviewers and lay citizens are more likely to find explanations of e.g. psychological phenomena more convincing when they contain neuroscientific information, even when it is not relevant to the explanation.

Incentive structures pull researchers in the same direction

Budtz Pedersen and Hendricks show how the 'breakthroughs' and' turning points' promised by many neuroscience projects – when combined with the fact that recent studies indicate a number of neuroscience publications seem to lack the statistical power to back their findings – have the potential to become a fully-fledged science bubble. In other words: the value of the neuroscientific promises and the investments made in them may turn out to bear no relation to the actual value of the scientific results.

A central cause of this is, according to Budtz Pedersen and Hendricks, the institutional design and incentive structures within science funding and research management, where traditional scientific incentives such as academic capital and reputation are being replaced by monetary incentives and competition.

"Numerous international studies of research management document how many Western universities have set up financial incentives and reward systems to encourage researchers to publish in high-impact journals on popular topics that generate research funding. This means that researchers often will have very little interest in spending time on problems that break away from mainstream or do not lead to publishable results, and they will tend to they dress their research claims up in ways that appeal to policy makers and external evaluators," Professor

Hendricks points out.

Scientific lemmings

The structural reforms of research management may, Budtz Pedersen and Hendricks continue, thus amplify social phenomena like "pluralistic ignorance" and "lemming effects," which have been shown to have significant impact on information processing and assessment in populations of interacting persons – including in one of the most rational enterprises of modern social life.

"Even in the highly rationalised science community, people are susceptible to a social-psychological phenomenon like pluralistic ignorance, where every researcher and policymaker individually may doubt the promises made by a particular research programme but also wrongly believe that everybody else is convinced of its robustness; so they all end up collectively supporting a dubious programme which subsequently receives generous funding," professor Hendricks says and concludes:

"When researchers choose to ignore their private information and instead mimick the actions of researchers before them, they initialise a so-called lemming effect in which everybody publishes in the same journals and applies for funding for the same type of projects. Such a scientific bubble will eventually bust when the programmes' scientific explanations are put to the test, but the problem is that they may already have drained the research system from resources. And then the system will be faced with an investor confidence crisis."

More information:
link.springer.com/journal/13347/onlineFirst/page/1

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