

Roads to perdition in the knowledge economy

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Economic geographers and economists have investigated for quite some time now the wider implications of the advent of the knowledge-economy (Jessop, 2000; Bathelt et al, 2004; O'Riain, 2006). We assume, for the sake of argument, that this metaphor is a useful conceptual tool. The point of this commentary is to highlight two of the ways in which an abundance of frequent and high quality information can nonetheless lead an economic agent to failure. We begin with the problem of frequent information, continue with the problem of abundant high quality information, and end with a general reflection about the lesson these two problems may offer for economic geographical scholarship.

The common intuition is that more frequent feedback is better because this would allow one to adapt both faster and at a lower cost than a competitor consigned to an environment with infrequent feedback. Real-time information systems are a flashy leitmotif of the knowledge-economy but their appeal stands or fails with the (un)soundness of this intuition. What this common intuition misses is that we live in a world that is noisy and probabilistic. In order to be able to tell apart long-term systematic trends from short-term stochastic noise one needs to take a longer view on phenomena. That is, one needs to have patience for one's experiential sample to grow large enough so that random short-term variation is not mistaken for systematic variation. The violation of

this elementary statistical principle by lay people was detected almost four decades ago by Tversky and Kahneman (1971), who labeled it the fallacy of the law of small numbers, i.e. the erroneous belief that small samples are very representative of the population of events from which they are drawn. Recent experimental evidence (Lurie & Swaminathan, 2009) has corroborated this finding and has illuminated the specific mechanisms by which lay people are misled by frequent feedback. Under conditions of frequent feedback, people grant too much significance to the more recent information available. Since recent information can be statistically redescribed as “the *small* sample of recent events”, we can detect here the operation of the fallacious law of small numbers. People’s failure to pool together data across a longer time horizon means that they are chasing noise while at the same time deluding themselves that they have timely information. They think that they learn, but they learn the wrong lessons. And this means that they are on “the road to perdition”. They accumulate false beliefs, which, in the short term, increase their confidence, while, in the long-term, lead them astray. In this case, economic failure is a joint function of overconfidence and false belief.

A related but distinct problem emerges in the case of abundant high quality information. The common intuition is that, all things equal, the more high quality information one’s environment provides, the better an agent’s chances of success. After all, knowledge is power. The problem with this intuition is that it fails to take into account our cognitive limitations as boundedly rational agents (Simon, 1955). In the jargon of information theory, one must analyse not only how much information the sender of the message transmits, but also how much information the receiver is able to process. We live in times

in which the gap between the rate of growth of knowledge available in our external environments (e.g. the knowledge-economy) and the rate of growth of the human capacity to process information (the latter measured by the g factor; Simandan, 2009) has increased considerably. The net effect of this increasing gap is similar to that discussed for the case of frequent feedback: we delude ourselves that our judgment is better (more accurate) because we have at our fingertips more high quality information than ever before, when in fact it is not our judgment that benefits from this wealth of riches, but our level of confidence. A striking confirmation of this hypothesis was obtained experimentally by Tsai et al (2008). They offered experimental subjects an increasing number of high quality predictive cues and noted that subjects' confidence in their predictions increased monotonically with the number of cues offered (the upper limit being 24), whereas their accuracy of prediction leveled off after only six predictive cues.

If we step back from the specifics of these two counterintuitive problems, we can extract a useful lesson about what to look for in the knowledge-economy in our theoretical and empirical scholarship. Economic agents are likely to be systematically misled by pervasive but erroneous intuitions about the nature of knowledge and the properties of human inferential ability. Immersed in a wealth of data, they may well be on the road to economic perdition because they rely too much on unwarranted intuitions, the byproducts of which are overconfidence and false beliefs. The lower (1) one's cognitive ability and (2) amount of statistical training, the higher the likelihood of falling in these traps (Stanovich, 2009). It immediately follows that any investigation that tries to find out the

secret of success and failure in the knowledge-economy should also take into account inter-individual variability along these two dimensions of cognitive prowess.

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