

Can Economics can be a separate Science?

By Lukas Beck

Abstract

Mill (1872, 1874) is an early proponent of the thesis that economics has a special domain in which it can operate relatively independently of findings from other sciences. Contra Mill, I argue that this so-called separateness-thesis is best defended under an externalist interpretation of Rational Choice Theory (RCT). Mill's defence is consistent with an internalist interpretation of RCT. Internalism holds that RCT depicts psychological mechanisms operating in economic agents. I argue that such a defence fails to establish separateness, because it makes economics highly depended on psychological findings. However, externalism understands RCT as an adequate description of how agents react to incentives if certain environmental structures are present. Under this interpretation, we can defend separateness by investigating which features of an environmental structure will lead agents to behave in accordance with RCT. Thereby, we can derive indicators that enable us to demarcate a separate domain for economics.

Introduction

The view of economics as an *inexact and separate* science was first outlined by John Stuart Mill (1872, 1874). This approach holds that economics is concerned with a special class of phenomena (the economic domain), in which some relatively well-known major causal factors are predominant. Those factors are supposed to be psychological mechanisms operating in the economic agent. Because economics is concerned with such a special domain, it is called separate. However, it is also inexact, because besides the major causal factors captured by economic models there are also minor causal factors operating in the economic domain. These minor causal factors will interfere with the major factors depicted in our economic models and thereby cause the real world to deviate from our predictions. For practical reasons (i.e. computational limitations) economists cannot include all the minor factors operating in the economic domain into their models.

Thus, we must start from the known major psychological mechanisms and deduce their joint implications. By doing this, economists can discover useful tendencies. Hausman (1992) can be regarded as a contemporary defender of a version of Mill's approach to economics. Yet, contra Mill, he is sceptical about the separateness of economics. Under his view, psychology can contribute to economics

by providing evidence for or against the mechanisms depicted in microeconomic models. In recent years, there has been a debate about similar arguments against the separateness of economics (see Gul and Pesendorfer 2008).

This paper argues for the possibility of an account of the separateness of economics different from Mill's account. I will argue that if we understand Rational Choice Theory (RCT), which is central to modern microeconomics, as a psychological theory, economics cannot be a separate science. However, I will question whether microeconomic models should be interpreted as depicting psychological mechanisms. There is an alternative interpretation of RCT, which understands it as an adequate description of how agents react to incentives if certain environmental structures are present (Satz and Ferejohn 1994, Ross 2011). I will argue that this so-called externalist interpretation of RCT offers economics the opportunity to be a separate science, while the psychological or internalist interpretation severely undermines this option.

The paper is structured into three parts. The first part outlines Mill's account of economics as an inexact and separate science. The second part argues that Mill's construal of economics as a separate science fails to withstand scrutiny. The third part introduces externalism as a different interpretation of RCT and thereby argues for the possibility of a separate domain of economics independent of psychology.

Economics as Inexact and Separate Science

According to Mill, economics is limited because we cannot easily conduct experiments. He defines economics as "the science that traces the laws of such of the phenomena of society as arise from the combined operations of mankind for the production of wealth, insofar as those phenomena are not modified by the pursuit of other phenomena" (Mill 1874, p. 140).

Under Mill's view, economics has a special domain. It is concerned with the actions of people, but only insofar as those actions are concerned with the pursuit of wealth. Mill holds that there are different psychological laws operating in human agents. Some of these laws are peculiar to or have a strong influence when it comes to the pursuit of wealth. Moreover, because these laws are relatively well known to us, we can deal with the experimental limitations of economics by deducing the implications which those laws would have if they operated in isolation. For example, the aversion of labour and the desire

for luxury are laws that are supposed to strongly operate in humans when they pursue wealth. Given information about the specific circumstances of human agents in different societies and time-periods, we can deduce the behavioural implications of those laws. Yet, as humans are never solely concerned with the pursuit of wealth, we will never observe the mechanisms underlying those laws operating in isolation. Instead, other mechanisms, which do not belong to the domain of economics, will interfere. Nonetheless, even though there is interference, the major mechanisms of the economic domain will still push the behaviour of economic agents into a certain direction. This means that the observed behavioural outcome will still be influenced by the mechanisms we investigated in isolation, but deviate from it due to the interfering factors. Note that this assumes that the psychological mechanisms are still operating in the presence of other mechanisms as they would do in isolation. In this regard, Mill introduces the term tendency. According to Mill, the presence of a mechanism constitutes a tendency in the behaviour of an agent iff the mechanism had the same influence on the resulting behaviour that it would have had if the mechanism had operated in isolation (Schmidt-Petri 2008).

To illustrate the notion of a tendency, consider the vector addition of forces in mechanics. In the absence of other forces, we can clearly determine in which direction an object will be pushed by a certain force A. However, even if an additional force B interfered with the object, the initial force A would still act on the object and partly determine in which direction it will be pushed. Even if we did not know about the interfering force B, and would be therefore unable to determine the exact motion of the object, we could use our knowledge of force A to determine the object's inclination of moving in the direction of force A.

More general, tendencies are the mechanisms that produce the general regularities that the laws of economics express (Mill 1874, see also Cartwright 1994). Economics is inexact because other causal factors interfere with the psychological mechanisms operating during the pursuit of wealth. However, this does not imply that economics has no separate domain to investigate. Its domain of inquiry is concerned with a subset of psychological mechanisms. By theorizing about the effects resulting from the combination of these different mechanisms and individual circumstances, economists are supposed to discover useful regularities (Mill 1874, pp. 152-153). During this process, the economist acts as if those mechanisms were the only ones operating within an agent. Hence, Mill's account of economics can justify that we can conduct economic research while paying little attention to the discoveries of other sciences. Given our practical limitations, and time and energy constraints, this has important implications for how we should practice economics.

Of course, economics has evolved since the time of Mill. Especially modern microeconomics heavily relies on RCT as a framework for modelling choice behaviour. Hence, the separateness of economics as a whole crucially depends on whether RCT is sufficiently independent from psychology. RCT can be stated as entailing that human agents are maximizers of utility. An agent is modelled as having a utility function and assumed to behave in a way that maximizes this function. Interpreted like this, it is a theory about psychological mechanisms. In this respect, it is compatible with Mill's account of economics as an inexact and separate science. Following Satz and Ferejohn (1994), I will call this the internalist interpretation of RCT. Many of the modern critics of RCT understand it in an internalist way (Hausman 1995). An internalist proponent of RCT holds that the behaviour of economic agents will show a tendency constituted by some psychological mechanism that can be described by RCT.

However, recent advances in psychological research programs like experimental and behavioural economics cast doubt on the view that there is a special domain, in which certain major psychological mechanisms operate that are successfully depicted by our economic models (see Kahneman and Tversky 1979, Camerer et al. 2005). Yet, I will challenge whether RCT models should be interpreted as depicting psychological mechanisms. In particular, I argue that if the internalist interpretation is correct, economists have to pay more attention to findings of other scientists that can inform them about the adequacy of the psychological mechanisms depicted in their models. Thus, it is highly doubtful whether economics can be a separate science in the sense of Mill. Yet, there is an alternative interpretation of RCT, which does not understand it as a theory of psychological mechanisms. Under this so-called externalist interpretation, RCT gives us an adequate description of how agents react to incentives if certain environmental structures are present (Satz and Ferejohn 1994, Ross 2011). It does not commit itself to some specific internal constitution of an agent, but holds that certain environmental structures cause agents to exhibit behaviour consistent with the predictions of RCT. If this is correct, we can demarcate a separate domain of economics by specifying the features of environmental structures that lead agents to behave according to RCT (Binmore 1999). Psychological findings would be of little concern in this domain, because the results of RCT would hold in virtue of features of the environmental structure, while psychological details of the agents involved could differ. Hence, the apparent critique RCT faces under the internalist interpretation does not necessarily imply that economics cannot be a separate science. I now expand on why economics cannot be a separate science under the internalist interpretation.

Internalism and the Separateness of Economics

In the last decades, RCT faced severe criticism from behavioural and experimental economics (Kahneman and Tversky 1979, Camerer et al. 2005). Contra Mill, its critics doubt that we have a good understanding of the major psychological mechanisms that govern economic behaviour. The critique of RCT usually proceeds by showing that the theory delivers wrong predictions in a domain in which it is supposed to work and interfering factors can be assumed to be absent, i.e. laboratory settings in which agents play games where money is at stake. In a second step, the critique usually delivers a model of an alternative mechanism that can account for the behaviour. In opposition to Mill, those authors believe that we can conduct useful experiments in the field of economics.

To illustrate this line of argument, I will now focus on Camerer et al. (2005). They argue that after a century of separation, insights of psychology have become important again in economics (see also Bruni and Sugden 2007). They make a difference between what they call *incremental* and *radical* approaches. The *incremental* approach is what neurological and psychological research will add in the short-run to economic models. For example, research on the neurobiology of addiction suggests how drugs decrease pleasure from future consumption of other goods (Camerer et al. 2005, p. 10). Such findings are supposed to directly inform how to model an agent's utility function.

In contrast, the radical approach tries to deliver a picture of how economics could have been if it had updated its psychology over the last hundred years. In the long-run, according to Camerer et al. (2005, pp. 10-11), psychological and neurological findings point to an entirely new set of mechanisms that underlies economic behaviour. Those mechanisms are often automatic and not accessible by introspection. Hence, they are very likely to deviate from the supposedly well-known mechanisms of Mill's approach and internalist RCT.

No matter what one thinks of the *radical* approach, it is hard to resist the *incremental* approach given the internalist interpretation. In favour of the separateness-thesis one could argue that even though many of the new psychological models outperform predictions of standard RCT in particular cases, RCT outperforms those models if applied to a more general domain (see Fumagalli 2016, p. 120). Hence, it could be argued that RCT describes a mechanism that constitutes a tendency in the economic domain and that economics is, therefore, a separate science in the sense of Mill. Of course, such a claim needs back up from future empirical research. However, for the current purpose of assessing the separateness of economics, this defence does not suffice. Contra to Mill's vision, in which the individual

psychological mechanisms of economics are well-known, economists would still need to engage with psychology to determine if RCT can plausibly be seen as depicting a psychological mechanism. Moreover, psychologists would also have to investigate in what domain such a mechanism is operating. Economists would depend on the psychologist's confirmation that RCT can (at least approximately) depict a plausible mechanism and that this mechanism is always operating in the way depicted by RCT when it comes to phenomena economists want to investigate. Hence, economics would depend heavily on findings of psychology and not be separate.

Of course, one could argue that once economics was helped out by psychology to get its basic principles right it can operate as a separate science. Yet, any research program that depends on very specific findings of another research program when it comes to its core commitments can hardly be viewed as a separate research program. The psychological findings on which economics would be built could be falsified. Given their high degree of specificity, this will tie economics to the progress of psychology and thereby undermine its separateness. Economics would rely heavily on psychological assumptions at the core of its research program for which it can provide no corroboration on its own (Lakatos 1978).

To summarize, the separateness of economics is threatened by recent advances in psychology if we subscribe to internalism. However, the aim of the next section is to offer an alternative to the internalist interpretation, which has the potential to defend the separateness-thesis.

Externalism and the Separateness of Economics

The critique of RCT by psychologists has caused vehement reactions from economists. Gul and Pesendorfer (2008) argue that economics is not about psychological mechanisms, but about choice. While their paper might express a general intuition of many economists, it has led to a lot of controversy and confusion (Ross 2011). In particular, they did not explain the difference between psychological and economic conceptions of choice well and focused on fierce rhetoric instead. I hold that their position is best reconstructed as expressing a view of RCT clearly outlined by Satz and Ferejohn (1994, see also Ross 2011). Their externalist interpretation states that RCT is best understood non-psychologically. Under this view, economic agents are regarded *as if* they were rational maximizers. Externalism does not assume that agents have the computational excellence needed for being actual utility maximizers. Instead, it relies on ecological rationality (Smith 2003, Harrison and Ross 2010). The basic idea here is that agents do not behave according to RCT because of some psychological mechanism, but because

economic agents are embedded in an environmental structure (i.e. certain institutions) that influences their behaviour into a certain direction. This environmental structure is supposed to be full of signals that offer agents a good chance of discovering best responses to a given situation. Of course, also under this view, the internal constitution of an agent is not entirely irrelevant. The agent must be constituted in such a way that she can respond to incentives of the environmental structure. However, under the externalist picture this response does not necessarily have to take the form of a deliberate process in which the value of possible outcomes is calculated. Instead, the interaction between agent and environment can take the form of gradual conditioning in which agents slowly adjust their behavior as a result of negative or positive feedback. In many cases, this will have the seemingly paradoxical result that RCT works best where the choice options of agents are rather limited, because in these cases agents might faster converge towards the optimal response than in those cases where they have more choice options (see Satz and Ferejohn 1994). To sum up, the externalist interpretation of RCT holds that, given certain features of their environmental structure, agents will converge towards the behaviour that is consistent with RCT predictions.

To illustrate this, consider a simple version of the Hotelling model (Hotelling 1929), which implies, if applied to a two-party system with a left and a right party, that both parties will converge towards the centre of the political spectrum. Under the externalist interpretation, this is not the case because a party leader calculated that moving to the centre will maximize her utility function, but simply because the environmental structure of a two-party system favours parties settled at the centre. A party, which locates itself far away from the centre will endure negative responses in the form of lost votes, while the parties closer to the centre will get a positive response. If the party has sufficient time to learn this and the model can be viewed as a sufficient approximation of the environmental structure of a specific political system, the outcome of this system will fit the prediction of the model.

How does this alternative picture help to defend the separateness of economics? Economics as a social science wants to investigate social phenomena such as market behaviour or political processes. If we ask why a certain type of behaviour is regularly observed in a population, investigating psychological mechanisms of individuals might not be of much help, because individuals can differ in the details of their psychological mechanisms (Harrison and Ross 2010). A psychologist who has excellent knowledge of an individual's psychology might be able to make more accurate predictions of that individual. However, the economist, who relies on RCT under the externalist interpretation can be expected to make better predictions for the whole population in cases where the environmental structure is the same for all individuals. The idea here is that the results of differing psychological mechanisms in different individuals can converge towards the same outcome if certain choices are clearly favoured by the

environmental structure. For example, consider the fact that most people that regularly consume alcohol avoid becoming addicts. Some may do this by carefully choosing consumption schedules that allow them to avoid addiction. Yet, some others will avoid addiction simply because they are responsive to the sanctions they would face if they were drinking during their work time (Ross 2011). Hence, psychological findings in laboratories, which place agents in a strange environment, in which they had no opportunity and incentives to discover optimal responses to the environmental structure, do not necessarily bear direct relevance for how economists should modify their models, because the laboratory situation might fail to specify the environmental structure present in the target of the economic model correctly. If this is correct, psychology and economics are pursuing different predictive and explanatory strategies that are suitable for different epistemic goals. More important in the present context, the externalist interpretation of RCT gives us a clear picture of how economics can pursue its goal independently of psychology.

So far I have only given a vague characterisation of the features of the environmental structure, which guarantee successful applications of RCT. Yet, an important question that still needs to be answered is which features are relevant and how we can further specify them. A first approximate list would include that there need to be adequate incentives to behave in a certain way and sufficient time for trial and error learning (Smith 1994, Binmore 1999). Obviously, these conditions need further quantitative specification. However, by further investigating these conditions we can arrive at a separate domain of economics. More specifically, the investigation of these features can lead us to a set of indicators that specify the conditions under which we are justified to expect that RCT provides us with reliable predictions. In turn, we can then use these indicators to demarcate a specific set of target systems of RCT, which would then constitute the economic domain. Whether this domain is coexistent with the phenomena economists want to investigate needs to be shown. Hence, it might turn out that the proper domain of economics is very different from Mill's view of economics as the study of human behaviour insofar as they pursue wealth. Nonetheless, the externalist picture allows us to hold up the separateness-thesis, while the internalist interpretation clearly speaks against it.

A Millian could object that one of the main goals of economics is to provide us with reliable predictions of social phenomena. She can argue that economics can achieve this aim in virtue of depicting stable tendencies constituted by psychological mechanisms. Yet, if we understand RCT as predicting the behavior of human agents when the environmental structure is constituted in a certain way, the Millian can question whether this provides us with reliable predictions given that the environmental structure could easily change. After all, only if economics provides us with reliable predictions, we have good reasons to defend its separateness.

However, I do not think that the point that environmental structures are subject to changes constitutes a serious disadvantage for the externalist. If the Millian picture of economics were correct, there would be some enduring psychological mechanisms that constitute stable tendencies in the economic domain. Yet, those mechanisms are not supposed to produce the same outcome independently of the circumstances. Quite to the contrary, according to Mill (1872), the psychological mechanisms of the economic domain always produce their outcomes depending on the circumstances of the agent in which they are operating. Furthermore, these circumstances are supposed to greatly differ between individuals in different societies and time-periods. This is part of the reasons why economics cannot be an exact science. It is very demanding to respect all the changing circumstances of the individuals in a society. Hence, the economist, like any other social scientist, has to limit herself to a subset of psychological mechanisms and deduce the outcomes of these mechanisms depending on the circumstances. Yet, in order to do this successfully, the economist has to keep track of the changing circumstances.

Now, if the Millian argues that changes in environmental structures required by the externalist interpretation would undermine the predictive capacity of economics, she simply points to the fact that we have to keep track of the changes in these environmental structures. We have to check if we are still justified in assuming that the system under investigation is a suitable target for RCT. Yet, it is not a peculiar problem of the externalist approach that we have to pay attention to potential changes in the target system. Predictive accuracy would suffer under the externalist as well as under the internalist picture if we do not track changes in our target systems. Of course, the set of systems that constitute the economic domain would be subject to changes over time, because changes in the relevant environmental structures would not only imply different outcomes, but also that RCT could not be viewed as making reliable predictions of some systems anymore. However, in order to be a separate science, economics need not have a fixed domain, but simply a separate one.

Moreover, in cases where the environmental structures are insufficient to guarantee that the predictions of RCT will hold, additional information from psychology can be useful to make economic models applicable. This could, for example, be the case in a scenario where all agents of a population share a common bias in their decision mechanisms and environmental feedback is too weak to eliminate this bias (Harrison and Ross 2010). However, this would not threaten the separateness of economics as the study of how the incentives of certain environmental structures influence behaviour, because economics would have its own domain in cases where the environmental structures are sufficient. Yet, such a case would point at a domain where fruitful interdisciplinary work can be done.

Conclusion

I argued that the separateness of economics is best defended under an externalist interpretation of RCT. Mill defended a version of the separateness-thesis consistent with an internalist interpretation of RCT. I argued that this defence fails to establish separateness, because it would make economics highly dependent on psychological findings. However, under externalism we can defend separateness by investigating which features of an environmental structure will lead agents to behave in accordance with RCT. Thereby, we can arrive at a list of indicators that enable us to demarcate a separate domain for economics.

We still need a precise account of the features of environmental structures that justify the application of RCT. However, defending the separateness-thesis is best done along the line of understanding RCT in an externalist way, because the internalist interpretation severely undermines it.

References

- Binmore, K. (1999). Why experiment in economics?. *The Economic Journal*, 109(453), 16-24.
- Bruni, L., & Sugden, R. (2007). The road not taken: how psychology was removed from economics, and how it might be brought back. *The Economic Journal*, 117(516), 146-173.
- Cartwright, N. (1994). *Nature's Capacities and their Measurement*. OUP Catalogue.
- Camerer, C., Loewenstein, G., & Prelec, D. (2005). Neuroeconomics: How neuroscience can inform economics. *Journal of economic Literature*, 9-64.
- Fumagalli, R. (2016). Economics, Psychology, and the Unity of the Decision Sciences. *Philosophy of the Social Sciences*, 46(2), 103-128.
- Gul, F., & Pesendorfer, W. (2008). The case for mindless economics. *The foundations of Positive and normative Economics: A handbook*, 1, 3-42.
- Harrison, G., & Ross, D. (2010). The methodologies of neuroeconomics. *Journal of Economic Methodology*, 17(2), 185-196.
- Hausman, D. M. (1992). *The inexact and separate science of economics*. Cambridge University Press.
- ___ (1995). Rational choice and social theory: A comment. *The Journal of Philosophy*, 92(2), 96-102.
- Hotelling, Harold (1929). Stability in Competition. *Economic Journal* 39 (153): 41–57
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica: Journal of the Econometric Society*, 263-291.
- Lakatos, I. (1978). *The Methodology of Scientific Research Programmes*: Ed by John Worrall and Gregory Currie. J. Worrall, & G. Currie (Eds.). Cambridge University Press.
- Mill, J. S. (1872). *The logic of the moral sciences*. Open Court Publishing.
- ___ (1874). *Essays on some unsettled questions of political economy*. JW Parker.
- Ross, D. (2011). Estranged parents and a schizophrenic child: choice in economics, psychology and neuroeconomics. *Journal of Economic Methodology*, 18(3), 217-231.
- Satz, D., & Ferejohn, J. (1994). Rational choice and social theory. *The Journal of philosophy*, 91(2), 71-87.
- Schmidt-Petri, C. (2008). Cartwright and Mill on Tendencies and Capacities. In *Nancy Cartwright's Philosophy of Science (Routledge Studies in the Philosophy of Science)*.

Smith, V. L. (1994). Economics in the Laboratory. *The Journal of Economic Perspectives*, 8(1), 113-131.

___ (2003). Constructivist and ecological rationality in economics. *The American Economic Review*, 93(3), 465-508.