

Different Cultures at the origin of Economic Science

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Introduction

What is Economics?

According to Robbins (1935, p. 16), Economics is “the science which studies human behavior as a relationship between ends and scarce means which have alternative uses”, however, in its historical origin, it was much more comprehensive than this trade-off between choices in the context of scarcity. Amartya Sen (1987, p. 22) points that “Economics relates ultimately to the study of ethics and politics”. Nevertheless, Sen identifies also another current, an “engineering” approach, methodologically based on logic and strongly influenced by the exact sciences. Besides, we can identify other streams of economic thought: the evolutionism, that highlights the importance of Biology to understand the economic processes; and the emergent behavioral economics, who explore the relations between Economics and Psychology.

In this brief article, our aim is to provide the basis for a more in-depth research on these topics. The next sections review those different influences: from Philosophy to Psychology, passing through the mathematization process with the Mechanics' metaphors and the importance of Biology; then underlining the importance of an inter and transdisciplinary approach to the current challenges that economic science face.

The origins of Economics - a “Moral Science”

Although the origin of Economics has deeper roots,¹ it is almost unanimous among economic historians to identify the end of the XVIII century as an important landmark in the definition of what is now considered Economy. In the context of the Industrial Revolution and the profound social changes that followed, the study of the organization of societies became an unavoidable theme and led to the emergence of so-called *Classics*, among them Adam Smith, who shared the view under which the study

¹ We can go back to the ancient Greece to relate the origins of Economics with trade - Plato and Aristotle formed an important part of many Eighteenth Century economics thinkers such as Adam Smith (Backhouse, 2002) - On the definition of Economics see also Backhouse and Medema (2009).

of Economics should lie on the understanding of the processes of creation and redistribution of wealth.

In *The Wealth of Nations* (1776), Smith observed the transformations of his time as opportunities for growth and prosperity, identifying the division of labour as the main driving force of productivity improvements, and so the economic growth. He defends a liberal approach to the economic system using the well-known metaphor of the invisible hand to represent the market mechanisms became famous, although framed in values as justice, morality and ethics within social life and economic relations (Backhouse, 2002).²

However, if Economics was born as Political Economy and its early thinkers were moral philosophers, over time it has acquired a more “scientific” character displacing the ethical and moral dimensions towards an approximation to the exact sciences, in particular to Mathematics and Physics.

Mathematics and metaphors of Physics - from the Classics to the Neoclassical Paradigm

In the 1870's, strongly inspired by the utilitarian theory and in a context of important developments in Mathematics and Physics, the so-called *Marginalist Revolution* brings a different view to the economic problem. They shift the focus to individual behavior, utility maximization and an optimal resource allocation, rather than the causes of the wealth of nations (Martins, 2015). Smith's Political Economy, which emerged as normative, was increasingly transformed towards an amoral and positivist-inspired science, where the *homo economicus*, the prototype of a rational and homogeneous representative agent was for Economics as the atom was for Physics (Louçã, 1997).

One of the protagonists of that time, Jevons (1871) argued that insofar as it deals with relations between quantities requiring a mathematical reasoning, it had to be a mathematical science. Another important author was Walras, who presented the *Theory of General Equilibrium* (1874), a multi-market model where forces of demand and supply interact and converge towards equilibrium through a natural price adjustment mechanism.³ Over the years this mechanistic approach prevailed and equilibrium became the central concept of economic theory.⁴

However, after the crash of 1929 when high levels of unemployment persist, Keynes (1936) claimed that market failed and defends a more effective role of governments to reestablish the aggregated demand in recession periods, founding thereby the modern macroeconomics. In the post war period,

² Smith defends that by pursuing his own interest, the individual frequently promotes that of the society more effectually than when he really intends to promote it. However, as a professor of moral philosophy, his ethical concerns were extensively present, being the main subject of his other masterpiece *The Theory of Moral Sentiments* (1759).

³ Making use of the mathematical developments of his time, Walras built a system of equations with a single and stable solution where prices equal the relations between rarities through what he called the *tâtonnement*.

⁴ Although critics such as Keynes and Schumpeter pointed out that the complex and diffuse reality of an economy that differs greatly from the regularity and predictability of some physics laws and pure mathematical models (Louçã, 1997, 1999).

the Keynesian ideas became popular being partly integrated in the neoclassical synthesis, that nevertheless preserved the assumptions of equilibrium and maximization at micro level,⁵ but by the 1970's a revivalist current influenced by the Chicago School of Economics gained strength. Led by Lucas, they reinforced a number of very strong assumptions and *ceteris paribus* conditions such as the market efficiency and the idea of a representative economic agent that makes rational decisions in order to maximize an objective function (Hoover, 2015).⁶ Presently, many of these ideas remain dominant in economic thinking confirming the influence of the neoclassical agenda in economic research (Karier, 2010).

The influence of Biology - "The Mecca of Economists"⁷

By the end of XIX century, strongly influenced by Darwinism emerged an evolutionary stream of Economics with several distinctive features of neoclassical theory, namely, the importance of path dependence and a more qualitative and less formal approach providing a holistic perspective of the economic system.

One of the most influential authors of this line was Joseph Schumpeter⁸ that argued that economics should be seen as an organic whole, intrinsically dynamic and structurally unstable, as opposed to the mechanistic view of *Marginalists* (Schumpeter, 1911, 1939 and 1942). He highlighted the role of innovation as the main engine of development and introduced the concept of *creative destruction*: “the process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one” (Schumpeter 1942, p. 83).

Several decades later, in a synthesis of the main ideas of evolutionary economics, Dosi and Nelson (1994) reinforced the role of the dynamic view of processes tracing the parallel with Darwinian theories. They identify several analogies between economics and biology fields, namely the existence of elements that generate variety and novelty (mutations/innovations) and the selection units (phenotypes) represented by economic agents that face the market competition in an analogous process to natural selection. In turn, also Hodgson and Knudsen (2008) underline the importance of Darwinism, not as detailed explanatory theory of social sciences, but as general framework always necessary but never sufficient to describe complex systems such an Economy.

⁵ Samuelson, who the New York Times called “the Einstein of Economics” for his unified theoretical framework of economics, was one of the most important authors of that synthesis receiving the Nobel Prize in 1970 (Karier, 2010).

⁶ Lucas argued that macroeconomics should be analyzed in the light of micro-fundamentals, being the large aggregates no more than the sum of the individual maximizing functions, so therefore the division between macro and microeconomics was artificial and meaningless (Lucas, 1976; Lucas and Sargent, 1979).

⁷ “The Mecca of economists lies in economic biology rather than in economic mechanics”. Alfred Marshall in the preface of 4th edition of *Principles of Economics* (1890).

⁸ Fagerberg (2003) points his great influence to the evolutionary ideas in the economic field, although Freeman and Louçã (2001) refer to Schumpeter as “the most heterodox of the orthodox”.

However, regardless these common features, in a *recent* bibliometric study on evolutionary economics, Hodgson and Lamberg (2018) report the inability to create a unified and coherent framework with effective weight in the economic research agenda. Nevertheless, its contribution is undeniable, bringing the role of knowledge, innovation and its spillovers mechanisms to the forefront of research (Fagerberg, 2006).

The Importance of Psychology – *homo economicus vs homo sapiens*

How the economy really behaves? How we make economic decisions?

In his General Theory (1936), Keynes emphasized the role of expectations and what he called the *animal spirits*,⁹ launching the basis of what would develop several decades later, when the lack of realism of the neoclassical assumptions led to the emergence of a new field of research that links Economics and Psychology, the behavioral economics.

In the 1970's, Kahneman and Tversky began an important research agenda that changed the way psychologists and economists think about thinking. One of their most important contributions was the *Theory of Loss Aversion* (1979), which in simple terms reflects the preference to avoid losses to acquire equivalent gains, then complemented with the study of endowment effect in Kahneman et al. (1990). In a comprehensive book, Kahneman (2011) shows many systematic errors of thought that do not fit into the neoclassical patterns of economic rationality, pointing that intuitive thinking is much more influent than one might think. In the same line, Thaler and Sunstein (2008) present several case studies where our decision-making is biased, arguing that applying the right incentives it is possible to significantly improve people's lives and therefore contribute to solving many of society's problems, the *Nudge Theory*.

At a macro level, Akerlof and Shiller (2009) address the economic drivers revisiting the power of the *animal spirit*. The authors also emphasize that as human beings, we make several decisions based on non-economic motives, such as confidence that functions as an amplifier of the turbulences in the economies, being therefore the base of many moments of expansion and economic recession.

In turn, also Finance has been strongly influenced by psychology in order to explore the human limitations that inhibit rational decision-making (Shiller, 2012), as well as new subareas that combine economics, finance, neuroscience and neurobiology emerged, such as Neuroeconomics (Brocas and Carrillo, 2008) and Neurofinance (Miendlarzewska et al., 2017).

⁹ Keynes argued that many consumer decisions were essentially the result of a spontaneous impulse to action rather than the result of a weighted average of quantitative benefits multiplied by quantitative probabilities (Keynes, 1936).

Concluding remarks – the importance of a transversal approach

Stigler (1984) refers to Economics as “an imperial science”, in the sense that addresses central issues in a considerable number of neighboring social disciplines without any invitations. However, if Economics has been at the center of human life dealing with several transversal questions, we can also argue that as a discipline it is deeply influenced by many other sciences.

This paper presents a brief synthesis of the different cultures at the origin of economic science. In fact, as Backhouse observes in the epilogue to his “History of Economics”, although there were times where seemed to be a tendency towards an integration, there is no single framework to look at economic issues. If Stigler argues that its growing abstractness and generality were the main causes to the imperialism above mentioned, one of the main criticisms to the neoclassical theory is precisely its excessive degree of abstraction, trying to understand complex social phenomena through a mechanistic approach represented by mathematical models and equations based on some unrealistic assumptions. Once, Schumpeter (1954, 1167-8) observed that “one sometimes has the impression that there are only two groups of economists: those who do not understand a difference equation; and those who understand nothing else”. Several decades later we observe that many of the walls remain, being therefore important to take into account the role of History and the view of Economy as an organism, not a machine, formed by human beings with all their limitations.

Although Romer (2015) claims that Science should be a sphere of objectiveness and certainly, a process that led to broad and shared consensus, we should attend to the specificities of a social science such Economics.¹⁰ It is fundamental to encourage the plural debate between the different sides, not towards a unified science, but in order to explore their diversity of cultures and enhance an inter and transdisciplinary approach based on the complementarity between them. It will be from the bridges between the different currents that we will be able to consolidate an economic science well prepared to answer the current socio-economic challenges that we face.

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¹⁰ Kuhn (1962) discusses the definition of Science, namely the issue of be or not to be a “Science” of many social sciences.

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