


The emergence of the conception of rationality in mainstream economics

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Recibido: 30/04/25 • Revisado: 15/07/25 • Aceptado: 07/08/25

EN Abstract. Rationality is a loaded term. When we say that a person's behaviour is rational, we hint that she acts as she *ought to* act. The normative dimension of rationality is often conflated, if not confounded, by social scientists. Historians of economic thought are not immune to this problem. The main thesis of this essay is that the earliest use of the term rationality in Economics appears in the work of Lionel Robbins and Paul Samuelson in the 1930s who identify rationality with consistency or transitivity of preferences. Using textual evidence, I show that the neoclassical economists who antedated them did not use the term 'rationality' and, although they did use the term 'Logic,' they did so without any normative pretensions. I identify three milestones in the process of emergence of an account of rationality in Economics. The first one was Jevons' separation of Economics from Ethics and the demarcation of the scope of the Science of Economics. The second milestone was Carl Menger's twin notions of economic goods and scarcity. The third and last milestone was Vilfredo Pareto's reinterpretation of utility as a scale of preferences and its refinement by Hicks and Allen. Last, I briefly discuss some conceptual shortcomings of the prevailing account of rationality in Economics.

Keywords. ethics; preferences; rationality; scarcity; utilitarianism; utility.

JEL Code: B13; B21; B41.

ES El surgimiento de la concepción de racionalidad en la economía dominante

ES Resumen. La racionalidad es un término con connotaciones normativas. Cuando decimos que el comportamiento de una persona es racional, insinuamos que actúa como debería actuar. La dimensión normativa de la racionalidad suele ser confundida por los científicos sociales. Los historiadores del pensamiento económico no son inmunes a este problema. La tesis principal de este ensayo es que el uso más temprano del término 'racionalidad' en Economía aparece en la obra de Lionel Robbins y Paul Samuelson en la década de 1930, quienes identifican la racionalidad con la consistencia o transitividad de las preferencias. Utilizando evidencia textual, muestro que los economistas neoclásicos que los precedieron no usaron el término 'racionalidad' y, aunque sí emplearon el término 'lógica', lo hicieron sin ninguna pretensión normativa. Identifico tres hitos en el proceso de aparición de una concepción de la racionalidad en la Economía Neoclásica. El primero es la separación que hace Jevons entre la Economía y la Ética, y la delimitación del campo de la Ciencia Económica. El segundo hito son las nociones conjuntas de bien económico y escasez acuñadas por Carl Menger. El tercer y último hito es la reinterpretación de la utilidad como una jerarquía de preferencias, realizada por Vilfredo Pareto y perfeccionada por Hicks y Allen. Por último, repaso brevemente algunas limitaciones conceptuales de la concepción actual de racionalidad en Economía.

Palabras clave. Ética; preferencias; racionalidad; escasez; utilitarismo; utilidad.

Códigos JEL: B13; B21; B41.

PT O surgimento da concepção de racionalidade na economia dominante

PT Resumo. Racionalidade é um termo carregado de significados. Quando dizemos que o comportamento de uma pessoa é racional, insinuamos que ela age como deveria agir. A dimensão normativa da racionalidade é frequentemente confundida, senão deturpada, pelos cientistas sociais. Os historiadores do pensamento econômico não estão imunes a esse problema. A tese principal deste ensaio é que o uso mais antigo do termo *racionalidade* na Economia aparece nos trabalhos de Lionel Robbins e Paul Samuelson na década de 1930, os quais identificam racionalidade com consistência ou transitividade das preferências. Utilizando evidências textuais, mostro que os economistas neoclássicos que os antecederam não usavam o termo

“racionalidade” e, embora usassem o termo “lógica”, o faziam sem nenhuma pretensão normativa. Identifico três marcos no processo de surgimento de uma concepção de racionalidade na Economia. O primeiro foi a separação feita por Jevons entre Economia e Ética, e a delimitação do escopo da Ciência Econômica. O segundo marco foi a noção de bens econômicos e escassez formulada por Carl Menger. O terceiro e último marco foi a reinterpretação da utilidade feita por Vilfredo Pareto como uma escala ou ordenação de preferências, e seu aprimoramento por Hicks e Allen. Por fim, discuto brevemente algumas limitações conceituais da concepção dominante de racionalidade na Economia.

Palavras-chave: Ética; preferências; racionalidade; escassez; utilitarismo; utilidade.

JEL classificação: B13; B21; B41.

Sumário: 1. Introduction; 2. From Political Economy to Jevons’ ‘Science of Economics’; 3. Vilfredo Pareto: the re-interpretation of utility as a ‘scale of preferences’; 4. Menger’s *economic* goods and the notion of scarcity; 5. Some remarks on the identification of rationality with preferences satisfaction; 6. Summary and conclusions; 7. References.

Cómo citar: Palacio-Vera, A. (2025): The emergence of the conception of rationality in mainstream economics. *Iberian Journal of the History of Economic Thought*, 12(2), 129-140. <https://dx.doi.org/10.5209/ijhe.104978>

1. Introduction

Rationality is one of the most widely discussed topics in philosophy, psychology, and the social and cognitive sciences. In the social and the cognitive sciences, rationality is typically equated with ‘instrumental rationality’(IR), a perspective that is deeply rooted in Western thought. An action is *instrumentally* rational if it represents the best feasible way of using the means available to attain a goal or set of goals. The prominence of this conception of rationality peaked in the mid-20th century as displayed by the emergence of expected utility theory and game theory and the subsequent emergence of the ‘bias and heuristics’ literature in the last two decades of the 20th century. What unites adherents to the notion of IR is its normative load which we may define as ‘correct use of the rules of Logic and Bayesian probability.’ In this approach rationality is algorithmic and cybernetic and applies equally to humans, non-human animals, and machines.¹ Its operationalization *via* mathematics has enabled social and cognitive scientists to use it to study a broad range of issues. Although this account of rationality is deeply rooted in Western philosophy, its operationalization can be traced back to the ‘marginalist revolution’ in Economics in the last decades of the 19th century. Building on the work of distinguished mathematicians of his time like Boole and De Morgan, Jevons (1871) laid out the foundations for the ulterior emergence of a conception of rationality defined as *consistency* (or transitivity) of one’s preferences among various goals or desires. However, the fact that the mathematization of Economics took place prior to the emergence of a normative conception of rationality appears to be a source of confusion

among some historians of economic thought who tend to associate rationality to Jevons (1871) himself and even to Classical economists such as Adam Smith and John Stuart Mill (Zouboulakis 1997, 2014; Zafirovski 2003).² The truth is that neither Jevons, nor Bentham or other Classical Political Economists used the term rationality in their work and when they referred to Logic they did it only for explanatory purposes and didn’t ascribe it normative status. In its modern usage individual rationality has a normative connotation: it is a pattern of behaviour we *ought* to follow if I are to be ‘rational.’ It is in this sense that I use the term rationality throughout.

The question naturally arises *when* the notion of rationality emerged in Economics and *who* were its main protagonists. I situate this milestone in the work of Robbins (1932) and Samuelson (1947) but devote most of the space to the discussion of the contributions of previous economists which paved the way for it. The methodology I follow consists of inspecting the work of a few selected predecessors, Jevons (1871), Menger ([1871]1976), Pareto ([1906]1971), and Hicks and Allen (1934), and then claim that they didn’t use the term rationality and, in those few occasions they referred to Logic, they didn’t ascribe it a normative sense. However, each of the above-mentioned scholars made path-breaking contributions in the form of various conceptual and technical innovations without which the emergence of modern Economics, with its two-fold interpretation of the ‘principle of utility’ as an explanatory or descriptive theory of individual economic behaviour and as a (normative) theory of rationality, wouldn’t have been possible.

The remainder of this manuscript is organized as follows. In the following section I evaluate the work of Jevons (*ibid.*). I review his mechanical analogy between mind and matter, trace the origins of his

¹ For example, Vickrey (1953, 35) argues that, in its purest and more abstract form, economic theory does resemble a system of logic, devoid of ethical content in the manner of Euclidean geometry.

² For example, Zouboulakis (1997, 14; 2014, ch. 3) insists on identifying Jevons’ conception of ‘constrained maximization’ with substantive rationality.

'Science of Economics' and explain the reasons he chose to circumscribe its scope to purely economic behaviour. In section 3 I discuss Pareto's distinction between logical and non-logical actions and his re-interpretation of utility as a scale of preferences. In section 4 I discuss Menger's twin notions of economic goods and scarcity. In the same section I refer to the elaboration of the first ordinal version of utility theory by Hicks, Allen, and Samuelson, and a de-psychologized cardinal version of it known as expected utility theory formulated by von Neumann, Morgenstern, and Savage. In section 5 I discuss some well-known conceptual difficulties stemming from the identification of rationality with the satisfaction of preferences. Finally, in section 6 I summarize and conclude.

2. From Political Economy to Jevons' 'Science of Economics'

Classical utilitarianism is a school of moral philosophy associated to the names of John Stuart Mill, Henry Sidgwick, Francis Edgeworth and, especially, Jeremy Bentham. Hereafter I take Bentham's magnum opus titled *Introduction to the Principles of Morals and Legislation* published in 1780 as the locus of utilitarian moral philosophy. It is widely believed that Bentham's work provided the conceptual foundations of modern economics. In this section I review how Jevons (ibid.) made the 'principle of utility' the cornerstone of the marginalist revolution. The significance of Jevons' work is not circumscribed to this contribution to Economics, however. Jevons' work is also noticeable for elaborating an account of the mind that differs markedly from the account implicit in the work of Classical Political Economists like Smith or Mill and whose main feature is the *mechanical* analogy between the mind and a calculating machine with no consciousness and capacity for judgement (Maas 1999). Although some historians attribute to Jevons the elaboration of a conception of economic rationality (Zouboulakis 1997; 2014), I will argue that he deliberately avoided extending this account of the mind to the 'Science of Economics'. While Jevons must be credited for the separation of Economics, as based on the 'principle of utility', from Ethics and the mathematization of the former *via* the use of differential calculus, the emergence of a normative account of rationality owes much more to the work of Pareto ([1906]1971) who *de-psychologized* the 'principle of utility' by identifying utility with a ranking of preferences and, especially, Menger ([1871]1976) who adumbrated the notion of scarcity.

2.1. The 'mechanical analogy' between mind and matter

The identification of Jevons' work with mechanical rationality (Maas 1999) may be mistakenly interpreted as indicating that there is a theory of rationality embedded in his *Theory of Political Economy* (Jevons 1871). Maas (ibid.) shows how Jevons's work on the 'Logical Abacus', a contrivance which mechanically produced logical deductions from a limited set of propositions, was part of an emerging conception of mechanical rationality of

which Babbage's 'Difference Engines' and the new formal Logic developed by Boole and De Morgan were also key ingredients. The articulation of these elements in the Abacus helped Jevons to define a common methodological approach to the natural sciences and Economics. As Maas (ibid., 589) explains, 'The Abacus helped Jevons to conceive of "economic man" like a machine, and analyse his behaviour with the same formalism'. The conception of rationality stemming from the work of Boole, De Morgan and Jevons is based on a view of the human mind defined as a calculating machine with no consciousness and, hence, separate capacity for judgement. As Maas (ibid., 596-603) explains, this conception was rejected by Mill and stands in stark contrast to the account of the mind adopted by philosophers like Kant, Hamilton, or Martineau in which there is room for consciousness, freedom of the will, and weakness of the will. What is noticeable, however, is that, the Abacus was a *representation* of the 'laws of thought' (Jevons 1871, 144) which implies that there was no difference between mind and matter (other than in the degree of complexity) in the sense that they both worked according to the 'principles of the lever': his Abacus could 'think' by simply pressing on a key or turning a handle. Jevons takes the mechanical analogy to Economics and makes it clear that 'the Theory of Economy thus treated presents a close analogy to the science of Statical Mechanics, and the Laws of Exchange are found to resemble the Laws of Equilibrium of a lever as determined by the principle of virtual velocities' (ibid., vii).³ However, as I argue below, the mechanical analogy between mind and matter didn't translate into a normative theory of rationality anyway.

2.2. Re-casting the 'principle of utility'

Although classical utilitarianism is a moral theory with important consequences for the design of institutions and the elaboration of legislation, it is widely believed that it also contains the seeds of modern Economics. The reason is that, as I illustrate below, Bentham (ibid., 1-2) presupposes that pleasure and pain are the main motivations behind human behaviour, and it was only a matter of time that someone would develop a theory of individual economic behaviour based on the 'principle of utility'. But doing so required the use of differential calculus. Jevons, who had been trained in mathematics and Logic, was in a privileged position to apply differential calculus to Bentham's utilitarian theory and develop a full-fledged theory of economic behaviour.⁴ His work, and that of many of his contemporaries epitomises the transition from Political Economy to Economics. The former included some fields presently associated to other social sciences and philosophy. While all versions of utility theory take *consequentialism* – the doctrine

³ The analogy between the 'Laws of Equilibrium of a Lever' and the 'Laws of Exchange' in Economics is elaborated in chapter 4 of Jevons' *magnum opus* (ibid.).

⁴ Jevons was a student of logician De Morgan and, although not particularly gifted in mathematics, he obtained a gold medal as the best candidate 'in the third branch', which included mathematics, logic, moral philosophy, and political economy (Maas 1999, 603).

which says that every act must be only guided by an assessment of its likely consequences — for granted, the specificity of the version of utility theory proposed by Bentham and his epigons was that it presupposes that the goodness of a ‘state of affairs’ is determined solely by the amount of pleasure and absence of pain associated to it:

‘The theory which follows is entirely based on the calculus of pleasure and pain; and the object of Economics is to maximize happiness by purchasing pleasure, as it were, at the lowest cost of pain... I have no hesitation in accepting the Utilitarian theory of morals which does uphold the effect upon the happiness of mankind as the criterion of what is right and what is wrong... But I have never felt that there is anything in that theory to prevent our putting the widest and highest interpretation upon the terms used... When the terms are used with a sufficiently wide meaning, pleasure and pain include all the forces which drive us to action’ (Jevons 1871, 23).

The last sentence in the previous quotation above reveals that Jevons (*ibid.*, 24) interprets utility theory not only as a *normative* theory of morality but also as a *descriptive* or *explanatory* theory of individual behaviour. In fact, he pays tribute to Bentham’s theory by reproducing the former’s formulation of the ‘principle of utility,’ the quintessence of classical utilitarianism:

‘Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. *They alone point out what we ought to do and determine what we shall do*; the standard of right and wrong, and the chain of causes and effects, are both fastened to their throne. They govern us in all we do, all we say, all we think; every effort we can make to throw off our subjection to pain and pleasure will only serve to demonstrate and confirm it. A man may claim to reject their rule, but he will remain subject to it. The principle of utility recognises this subjection and makes it the basis of a system that aims to have the edifice of happiness built by the hands of reason and of law. Systems that try to question it deal in sounds instead of sense, in caprice instead of reason, in darkness instead of light... *By the principle of utility is meant the principle that approves or disapproves of every action according to the tendency it appears to have to increase or lessen—i.e. to promote or oppose—the happiness of the person or group whose interest is in question.* I say, ‘of every action,’ not only of private individuals but also of governments. By ‘utility’ is meant the property of something whereby it tends to produce benefit, advantage, pleasure, good, or happiness (all equivalent in the present case) or (this being the same thing) to prevent the happening of mischief, pain, evil or unhappiness to the party whose interest is considered. If that party is the community in general, then the happiness of the community; if it is a particular individual, then the happiness of that individual’ (Bentham 1780, 1-2, emphasis added).

Judged from a modern perspective, we might say that, as presented by Bentham, the status of the ‘principle of utility’ is two-fold. When it is the utility of the community (i.e., society) what matters, the ‘principle of utility’ is better interpreted as a normative theory of morality or a theory that says how an individual *should* behave. However, when what is at stake is one’s own utility, the ‘principle of utility’ is better interpreted as a descriptive or explanatory theory of human behaviour since, as Bentham (*ibid.*) claims, pleasure and pain dictate ‘what we shall do.’ The idea that the ‘principle of utility’ is a theory of morality when it is the utility of the community what matters is uncontroversial. However, when it is the utility of an individual what is at stake, there may be a conflict between what she *needs* to do to maximize her own utility and what she *should* do if she sought to maximize the utility of the community. While Economics occupies itself with the former, Ethics occupies itself with the latter. For Bentham, the morally right action is the one that produces the greatest net happiness for the greatest number. However, if we follow Bentham and assume that an individual normally maximizes her own utility rather than the community’s, her behaviour will tend to be immoral. It is for this reason that Jevons’ ‘Science of Economics’ marks off its separation from ethics. This had a critical collateral effect: Economics became orphan in normative terms since there was nothing left to replace utilitarian Ethics with.

The emergence of an axiomatic version of utility some decades later implied that utility-maximization came to be interpreted *both* as a normative theory of rationality and as a descriptive or explanatory theory of economic behaviour. However, neither Bentham nor Jevons use the term rationality in their work.⁵ The question emerges why Jevons, who had elaborated a mechanical account of the mind, failed to connect utility-maximizing behaviour and rationality. I conjecture that if Jevons had identified utility-maximization with rationality — when it is an individual’s own utility what matters — he would have faced a formidable conceptual conundrum. An individual’s utility rarely coincides with that of the community in general. If moral behaviour aims at maximizing the community’s utility, then individual behaviour aimed at maximizing one’s utility will tend to be immoral. Further, utility-maximizing behaviour may be immoral in yet another sense. If I steal someone’s property without having an ethical justification for acting so, then sell it and employ its proceeds to purchase goods with a view to maximizing my own utility, such behaviour is also immoral. Thus, if Jevons had used the term rationality to refer to individual behaviour aimed at maximizing one’s utility, he would have found that such behaviour may be the source of a *conflict*

⁵ The term ‘rationality’ is not mentioned in Bentham’s classic work (Bentham 1779). It is mentioned only once in passing in a section unconnected to utility theory in an edition of Bentham’s unprinted manuscripts compiled by Stark (1954, 179). Likewise, the term rationality is not mentioned either in Jevons’ *Theory* (*ibid.*) or in the classic piece by Hicks and Allen (1934). The earliest use of the term appears to be in the work of Weber ([1904]1949) and Robbins (1932). This is no coincidence, however. Robbins was one of the few Anglo-Saxon economists of his time who could read German and, hence, read the untranslated (into English) work of Menger and Weber.

between morality and rationality with the resulting conundrum: should we give normative priority to rationality or morality? Jevons (ibid.) eluded this thorny issue by failing to identify utility-maximization with rationality and making clear that Economics is solely concerned with an individual's utility (ibid., 39). But the decision to make an individual's utility the object of Economics had profound methodological consequences. Neoclassical Economics was cut off from Ethics.⁶ From Jevons onwards, the purpose of Neoclassical Economics is not to judge the morality of individual behaviour but to explain and/or predict economic behaviour:

'We must beware of restricting the meaning of the word [utility] by any moral considerations. Anything which an individual is found to desire and to labour for must be assumed to possess for him utility. *In the science of Economics, we treat men not as they ought to be, but as they are*' (ibid., 38, emphasis added).

However, and for the reasons expounded above, once the 'principle of utility' got rid of its ethical connotations, Jevons did not confer it *normative* status: he did not identify utility-maximization with rationality. The separation of Economics from Ethics marks the birth of the former as a social science with a scientific status which, according to Jevons, matches that of the natural sciences.

'I hesitate to say that men will ever have the means of measuring directly the feelings of the human heart. A unit of pleasure or of pain is difficult even to conceive; but it *is* the amount of these feelings which is continually prompting us to buying and selling, borrowing and lending, labouring and resting, producing and consuming; and *it is from the quantitative effects of the feelings that we must estimate their comparative amounts*. We can no more know nor measure gravity in its own nature than we can measure a feeling; but, just as we measure gravity by its effects in the motion of a pendulum, so we may estimate the equality or inequality of feelings by the decisions of the human mind' (ibid., 11).

Thus, if we follow him, the peculiarity of Economics *vis-à-vis* the natural sciences is that 'its ultimate laws [that every individual will choose the greater apparent good, that human wants are more or less quickly satiated and that prolonged labour becomes more and more painful] are known to us immediately by intuition' (ibid., 18).⁷ Economics is the result of ascribing to the 'principle of utility' the status of a descriptive or explanatory theory of individual behaviour and using mathematics to derive, *via* deductive reasoning, the implications

of assuming that behaviour is utility-maximizing.⁸ These contributions make his *magnum opus* (ibid.) a seminal work. As Robbins (1936, 4) writes, 'the idea that the origin of the objective exchange values of the market was to be traced to the subjective valuations of individuals, was very revolutionary'. In Jevon's subjective theory of value, given the quantities of the production factors and their technical substitutability, the cost of production of commodities is determined by subjects' preferences. If this were not enough, 'the new theory provided the basis for a far-reaching unification of the very subject matter of economics' (ibid., 5). This is Jevons's legacy to Economics.

2.3. The scope of the 'Science of Economics'

It would be incorrect to assume that Jevons (ibid.) first introduced the 'principle of utility' into Economics. In the preface to the second edition of his *Theory*, Jevons (ibid., xxxi-xxxiv) recognises that Heinrich Gossen's book titled (in English) *Development of the Laws of human commerce, and of the consequent Rules of Human Action* published in German in 1858 anticipated his own work.⁹ Jevons notes that the thrust of the book is the idea that Economics is the 'theory of the procedure by which the individual and the aggregate of individuals constituting society, may realise the maximum of pleasure with the minimum of painful effort' (ibid., xxxii). Both scholars seemingly upheld a two-fold interpretation of the 'principle of utility' as a theory of morality and as a descriptive or explanatory theory of economic behaviour and identified Economics with the latter. That said, Jevons (ibid., xxxv) makes it clear that there are significant differences between his own and Gossen's work regarding the formal treatment of the 'principle of utility' and even insinuates that Gossen's work exhibits several conceptual weaknesses. For the sake of convenience, in the remainder of this section I only discuss Jevons' work.

Being intellectually attached to Bentham's utilitarianism the notion of rationality would have posed a formidable conceptual challenge to Jevons and his contemporaries: how can rational behaviour be immoral and vice-versa? The furthest he goes is to identify utility-maximization with Logic.¹⁰ The Logic in question is that of consequentialism but most modern-day philosophers would probably say that a logical action is not rational unless it increases one's welfare or well-being. While utilitarians stress the interpretation of the 'principle of utility' as a theory of morality, Jevons stresses its role as a descriptive

⁶ Jevons' 'Science of Economics' may also be viewed, together with the fact-value dichotomy endorsed by Logical Positivists, as the origin of the distinction between Positive and Normative Economics.

⁷ The principle that 'wants are more or less quickly satiated' was probably inspired by the *Fechner-Weber law*, after German psychologists Gustav Theodor Fechner and Heinrich Weber, which reads as follows, 'if stimulus increases geometrically, sensation increase arithmetically'.

⁸ Mirowski (1984, 362) claims that the most significant aspect of the 'marginalist revolution' was not the postulate of a subjective theory of value but the 'penetration of mathematical discourse into economic theory'. He also claims that 'neoclassical economic theory was appropriated wholesale from mid-nineteenth century physics; utility was redefined so as to be identical with energy' (ibid., 366).

⁹ However, Jevons (ibid., xxxv) remarks that he was not aware of Gossen's book until after publishing the first edition of his *Theory of Political Economy*.

¹⁰ In the section titled the 'Logical Method of Economics' in chapter 1 of his *Theory* Jevons describes his work as 'the mechanics of utility and self-interest' which suggests the existence of a connection between Economics and Logic (ibid., 21). Jevons identifies the latter with the use of the deductive method in the social sciences which he associates to Mill. However, he doesn't use the term in the rest of the book.

or explanatory theory of individual behaviour. It may be useful at this stage to break down the 'principle of utility' into its elementary parts. As Sen (1987, 39) explains, as a moral doctrine, utilitarianism is the result of combining three separate elements: (i) *welfarism* or the requirement that the goodness of a 'state of affairs' be a function only of the utility associated to that state, (ii) *sum-ranking* or the requirement that the utility associated to a state be assessed by looking at the sum-total of the utilities of all the individuals involved in that state, and (iii) *consequentialism* or the requirement that every choice of action, norm, rule, law, or institution, be determined exclusively by the goodness of the resulting 'state of affairs'. Jevons takes consequentialism and welfarism, and leaves sum-ranking aside, to propose an explanatory theory of individual behaviour. While consequentialism may be problematic if we seek to develop an explanatory theory of individual behaviour, welfarism may be the problematic component if the goal is to design a normative theory of rationality. Any explanatory theory of individual behaviour based on consequentialism is subject to the objection that some observed forms of behaviour do not seem to be driven by people's assessment of the likely consequences of their actions (Palacio-Vera 2025). This is clear, for instance, in forms of moral behaviour grounded on deontological ethics. In contrast, consequentialism is largely uncontroversial when it is embodied in a theory of rationality since, even if our actions are not always based on an analysis of their likely consequences, one can legitimately claim that they *should* be based so (cf. Scanlon 2001, 49).

Let us consider welfarism. Utilitarianism identifies the good with pleasure and the absence of pain defined in a broad sense such that they include physical, moral, and mental pleasures and pains (Bentham 1780, 1-2). However, even with such a broad definition of pleasure and pain classical utilitarianism remains conceptually problematic as a theory of morality (when it is the utility of society what matters) due to its welfarist component. As I argue in section 5 below, these problems were aggravated with subsequent applications of the 'principle of utility' in which welfare is identified with a scale of preferences. For one thing, the difference between pleasure and pain broadly defined may not be a good proxy for well-being (Sen 1987, ch. 2; Nussbaum 2000, ch. 1). For another, it is not clear that conventional measures of welfare based on per capita GDP (adjusted for the degree of inequality in the distribution of income and wealth) are a good proxy for the good itself. What people prefer to do or to buy with their income may be weakly correlated with their well-being (e.g., gambling at the Casino, smoking). At a deeper level, the identification of hedonism as the supreme goal of human life is a product of the Western liberal tradition but other traditions prioritize other goals. Christians and Buddhists, to give two examples, do not identify the supreme goal of human life with hedonism (Harari 2011, 439-444). For Buddhism, the key to happiness is to know the truth about yourself – to understand who, or what, you really are. For Christians, the supreme goal of human life is to glorify and enjoy God forever. Jevons may have been vaguely aware of some of the conceptual difficulties associated to

welfarism (even though the term had not yet been coined) and, in the introduction to the third edition of his *Theory* (Jevons 1871), he explicitly refers to them. Reproducing the words of Mary Paley Marshall, an economist who was married to Alfred Marshall, Jevons (*ibid.*, 26) writes that 'the utilitarian theory holds that, all forces influencing the mind of man are pleasures and pains of one kind only' so that it can be assumed that pleasures and pains differ only in their intensity and duration.¹¹ However, he admits the existence of a conceptual problem with Paley's statement:

'It seems hardly possible to admit Paley's statement, except with an interpretation that would probably reverse its intended meaning. Motives and feelings are certainly of the same kind to the extent that we can weight them against each other; but they are, nevertheless, almost *incomparable* in power and authority' (*ibid.*, emphasis added).

Thus, Jevons rejects Paley's claim that all pleasures and pains are *commensurable* and, hence, reducible to a common metric named 'utility.' But then, it may be impossible to determine the impact on utility of an action by adding up different types of pleasures and pains.¹² Jevons identifies three types of pleasure and pain, physical, moral, and mental (*ibid.*, 25) and, probably influenced by Mill (1969), who distinguishes between lower and higher pleasures, hypothesizes the existence of a ranking of feelings with, seemingly, mental and moral feelings pertaining to the upper part of it, and physical ones pertaining to the lower part (*ibid.*). But then, if distinct types of feelings are incommensurable, can the 'principle of utility' be the conceptual foundation for a theory of individual behaviour? For the former to be an operational concept, it would be necessary that all pleasures and pains be reducible to a single metric so that we can add them up and calculate the overall utility of an action. In a paragraph that has been utterly ignored by ulterior utility theorists, Jevons sorts this problem out as follows:

'My present purpose is accomplished in pointing out this hierarchy of feeling, and assigning a proper place to the pleasures and pains with which the Economist deals. *It is the lowest rank of feelings which we here treat*' (*ibid.*, 27, emphasis added).

It is clear, then, that Jevons thought that Economics deals 'with the lowest rank of feelings' by which he meant *physical* pleasure and pain. Presumably, physical pleasure is the result of enjoying certain types of goods whereas physical pain is the result of doing certain types of work, sickness, hunger, etc.

¹¹ In contrast, as Jevons (1871, 28-29) notes, Bentham identifies seven properties of feelings: intensity, duration, certainty or uncertainty, propinquity or remoteness, fecundity, purity, and extent.

¹² Edgeworth ([1881]1967) places himself along Paley and maintains that 'pleasure is measurable, and all pleasures are commensurable' by which he means (i) that different sorts of pleasures felt by one person can be measured on a single scale, and (ii) the pleasures of different persons are commensurable.

However, arguably, some goods and some types of work may also be the source of mental and moral pleasure so that, if we follow what Jevons tells us, it is unclear how theorists can avoid incorporating mental and moral pleasures and pains in their utility functions. Be that as it may, Jevons' demarcation of the scope of Economics was brushed aside several decades later with the interpretation of Economics as the Science of Choice (Robbins 1932).¹³ The upshot is that Jevons' belief that different types of feelings may not be commensurable led him to interpret Bentham's 'principle of utility' as a descriptive/explanatory theory of *economic* behaviour with no normative pretensions.

3. Vilfredo Pareto: The re-interpretation of utility as a 'scale of preferences'

There is broad agreement among historians of economic thought on the idea that the work of Vilfredo Pareto represents a watershed between the work of the protagonists of the 'marginal revolution' and the emergence of an axiomatic version of utility theory in the 1930s. It is widely believed that, notwithstanding the importance of his conception of economic efficiency, Pareto's most important contribution to Economics was to rid it of its hedonic and psychological elements. However, as Bruni and Guala (2001, 38) note, the textual evidence supports the thesis that Pareto did not intend to rid Economics of these elements and believed that, although *static* economic analysis can dispense with cardinal utility and its hedonic connotations, *dynamic* economic analysis cannot. The significance of Pareto's figure is that his work represents a bridge between the 'marginalist revolution' and modern Neoclassical Economics thereby justifying its labelling as the 'Paretian turn.' If I argued above that Jevons sought to develop a Science of Economics with no normative pretensions, Pareto sowed the seeds of a return of normativity to Economics in the form of his notion of *logical* actions. The normative vacuum left by Jevons and his marginalist epigones was thus filled several decades later with a novel account of normativity which had neither ethical nor hedonic connotations: rationality.

Pareto's starting point is the idea that every social phenomenon may be considered under two aspects: (i) as it is 'in reality,' and (ii) as it presents itself to the mind (Pareto [1916]1935, 76). In line with the positivist philosophy which dominated the academia in the early 20th century, Pareto denotes the former as *objective* and the latter as *subjective*.¹⁴ As he explains, the operations performed by a chemist in the lab and the operations of a person who practices magic are examples of the objective and subjective

aspect of an event respectively. Pareto illustrates the difference between these two aspects of social events with an example taken from Homer's *Odyssey*. As he puts it (ibid.), 'the conduct of Greek sailors in plying their oars to drive the ship over the water and the sacrifices they offered to Poseidon to make sure of a safe voyage' captures the subjective aspect of an event. To Greek sailors, the most effective way to make sure of a safe journey back to Ithaca was to offer sacrifices to Poseidon whereas, from an objective standpoint, the most effective way to have a safe journey was to keep rowing at the highest sustainable pace. However, Pareto (ibid.) concedes that *all human knowledge is ultimately subjective* which means that the subjective and objective aspect of an event are 'to be distinguished not so much by any difference in nature as in view of the greater or lesser fund of factual knowledge that we ourselves have' (ibid.). This idea underpins his distinction between logical and non-logical actions. The former are actions that logically conjoin means to ends not only from the subjective standpoint of an individual but also 'from the standpoint of other individuals who have a more extensive knowledge' whereas the latter are actions that logically conjoin means and ends *only* from the subjective standpoint of an individual (ibid., 77). It thus follows that the only difference between logical and non-logical actions is their epistemological foundations: while the former are always based on true beliefs, the latter may also be based on false beliefs. According to Pareto, Political Economy (or Economics) occupies itself with logical actions whereas sociology occupies itself mainly with non-logical actions.¹⁵

Let us consider the epistemological status of Pareto's logical actions. As Bruni and Sugden (2007, 155) explain, for Pareto, 'an action is *logical* if and only if it is the result of valid instrumental reasoning from objectively true premises'. But then, how can one be sure that the premises our reasoning is based on are true? The conceptual trick consists of assuming that, when it comes to economic choices, people's beliefs are true (Pareto, [1906]1971, ch. 3, §1). This, he does, by restricting the scope of Economics to the study of *repeated* actions. The implicit argument is that, when we repeat an action many times, our beliefs tend to converge to the objective true by means of a mechanism of 'trial and error-elimination.' In the wake of it, Bruni and Sugden (ibid., p. 156) argue that Pareto's theory applies only to a limited area of human behaviour thus imposing major restrictions on the type of social phenomena

¹³ The conception of utility itself also changed after Jevons. As Broome (1999, 19-26) explains, for Bentham and Jevons utility was the *tendency* of an object to produce good but, after Jevons, utility came to mean *good* itself. This meaning was then overlaid, with the emergence of the axiomatic version of utility theory, by yet another meaning: utility is that which represents a person's preferences.

¹⁴ The central tenet of Positivism is that 'facts are the sole objects of knowledge and that awareness of their existence could be achieved through a method that was essentially common to all disciplines' (Seligman 1969, 257).

¹⁵ Pareto's demarcation of the scope of Economics and Sociology based on his distinction between logical and non-logical actions exhibits some similarities with Samuelson's proposed 'division of intellectual labour' between Economics and Sociology (Samuelson 1947, 90). For Samuelson, the intellectual tradition associated to Durkheim's work presupposes that individual behaviour is driven largely by values which are beyond the initiative and decision of individuals whereas the intellectual tradition that stems from the work of Classical Political Economics views individual behaviour as being appropriate to the problem-situation facing individual actors. Duesenberry's famous quip that 'economics is all about how people make choices; sociology is all about how they don't have any choices to make' captures these two intellectual traditions (Duesenberry 1960, 233).

that Economics can explain. They note that, despite the enormous impact of Pareto's work, most of the theorists who have seen themselves as Pareto's followers have subsequently ignored his criterion. In this sense, Pareto's decision to restrict the scope of Economics to *repeated* actions ended up having the same fate as Jevons' proposal to restrict the scope of Economics to actions driven by 'feelings of the lowest rank' mentioned above.

Next, let me consider the nature of Pareto's logical actions in some detail. Logical actions can be broken down into two different dimensions of rationality: instrumental and epistemic. First, an action is *instrumentally* rational if it represents the best way of using the means available to us to fulfil a set of goals or desires *given* an actor's beliefs. Second, it is *epistemically* rational to have a certain belief if it is true or plausible; otherwise, it is epistemically irrational to have it. Thus, an action may be instrumentally rational even if it is based on false beliefs. Given these definitions, an action is logical in Pareto's sense if it is instrumentally rational and it is epistemically rational to have the beliefs it is based on, whereas an action is non-logical in Pareto's sense (even if it is instrumentally rational) if the beliefs it is based on are false or implausible. This means that what distinguishes logical from non-logical actions is the truth or plausibility of the beliefs on which they are based. It is no exaggeration to say that most actions are instrumentally rational whereas only a small proportion of them are based on true or plausible beliefs. But then, Pareto's non-logical actions are as logical, in the usual meaning of Logic, as his logical actions since both types of actions are instrumentally rational and, hence, grounded on Logic. In the example above, the sacrifices that the Greek sailors offered to Poseidon were the *logical* response to the (false) belief that Gods determined their fate. The key issue is, however, whether Pareto's notion of logical actions contains a theory of rationality. Following the example above, could Greek sailors be accused of being irrational? Given the knowledge they had about the causes of natural phenomena they could not be accused of being non-logical or irrational. Their behaviour was instrumentally rational. Further, they thought that beliefs were true. They could not be accused of intentionally having false beliefs. The reason is that beliefs are *unintentional*. I believe X because I have reasons to believe that X is true or plausible. Even if I prefer to believe that X is false, I cannot change my mind unless I have reasons to believe that X is false. But then, if our beliefs are, by and large, unintentional, I cannot be accused of irrationally sticking to false or implausible beliefs. As I noted above, Pareto presupposed that, when actions are repeated many times, beliefs eventually hit the truth (Pareto [1906]1971, ch. 3, §1). But the possibility of repeating an action many times is not a criterion on which the rationality of individual behaviour can be based. If, by normativity we mean the desirability that one's actions adhere to a certain scheme, it does not seem that Pareto's logical actions exhibit normative content other than the requirement to be instrumentally rational. But, as argued above, this requirement also applies to non-

logical actions.¹⁶ Thus, there is no basis for assuming that Pareto intended his notion of logical actions to be a (normative) theory of rationality.

Last, it seems that Pareto's main goal when making the distinction between logical and non-logical actions was to *demarcate* the scope of Economics. If so, his theory of value is *the science of logical action* or, as I indicated above, a descriptive or explanatory theory of economic behaviour. In their seminal paper on the theory of value, Hicks and Allen (1934, 54) praise Pareto for transforming it into a general 'Logic of Choice' in a way that extended 'its applicability over wide fields of human conduct'. This reference to the 'logic of choice' is, in principle, reminiscent of the 'Logical Method of Economics' (Jevons 1871, 16).¹⁷ However, when they (ibid., 52) evaluate Pareto's contribution to Economics they make clear that his definition of utility as a 'ranking of preferences' was his main contribution to Economics. What is noticeable is that, as I noticed above, there is no single reference to Logic or rationality in Hicks and Allen's piece. This suggests that, to understand the link between utility, interpreted as a ranking of preferences, and rationality, we need to study another protagonist of the 'marginalist revolution': Menger.

4. Menger's economic goods and the notion of scarcity

I have argued above that Jevons eluded interpreting utility-maximizing behaviour as rational. I have also argued that Pareto's logical actions do not carry normative import and that, in their seminal article on the theory of value, Hicks and Allen (ibid.) do not use the term rational or logical. However, the seeds of the notion of rationality in mainstream economics had already been sowed by Carl Menger ([1871]1976) in the late 19th century. In his piece on Jevons, Robbins (1936, 5) points out that 'Professor Hayek, has stated that Menger... Jevons' great contemporary, was the first to base the distinction between free and economic goods on the idea of scarcity'. Robbins (ibid., 6) notices that, in repudiating the link with hedonism 'modern economics has followed Menger rather than Jevons'. In this section, I argue that the emergence of a *normative* theory of rationality in Economics was a consequence of the occurrence of three separate yet complementary developments: (i) Jevons' Science of Economics, (ii) Pareto's redefinition of utility as a 'scale or ranking of preferences', and (iii) Menger's notion of scarcity.¹⁸ Since I have already discussed (i) and (ii) above, this section is devoted mainly to Menger's view of man and its theoretical repercussions. Menger ([1871]1976, 111) makes a crucial distinction between

¹⁶ So, although I agree with Zouboulakis (2014, ch. 4) that there is a notion of 'instrumental rationality' in Pareto's logical actions, the reality is that, for the reasons expounded above, the 'weight of rationality' does not rest on the former but on epistemic rationality.

¹⁷ Parenthetically, Robbins (1936, 7) identifies the 'logic of choice' with Jevons rather than Pareto. Yet, as I noticed above, Jevons uses the term 'logic' only a few times in his *Theory of Political Economy*.

¹⁸ Admittedly, other neoclassical economists contributed to the emergence of a conception of rationality in Economics among which, Frank Knight and John Maurice Clark occupy a special place.

economic and non-economic goods. The former are available only in limited supply whereas the latter are abundantly available. He portrays man as one who satisfies diverse needs with goods by *choosing* them to satisfy their needs lexicographically, with necessities first, luxuries second, etc. (ibid., 129). To him, man is an economizer, not a maximiser (ibid., 95).

The shift from maximising to economizing behaviour had deep repercussions; if goods are scarce, man *must* economize. Economizing is necessary. For the first time since Bentham economists had identified a pattern of individual behaviour to which they could confer *normative* status with no ethical connotations. As Weber ([1904]1949, 65) puts it, 'Specifically economic motives... operate whenever the satisfaction of even the most immaterial need or desire is bound up with the application of *scarce* material means'. In a similar vein, Robbins (1932, 31) claims that Economics no longer deals with 'the causes of material wealth' but with 'human behaviour conceived as a relationship between ends and means'. The central idea is that, since the typical situation is one of scarcity, people need to make choices to obtain the greatest possible result with a limited quantity of a good. As Morgan (2006, 19) explains, while in the marginalists' conception man's desires dictated his valuations and so his choices, for mid-twentieth-century economists 'it was choices that were dominant in the sense that it was assumed that desires can only be maximized by rational choices. But choices are driven by *relative* valuations based on preferences. The latter were taken as 'data' about which economists have nothing to say (Robbins, 1932, 95) and Economics, it was claimed, is value-free (ibid., 91) (cf. Putnam, 1993). In the wake of it, mid-twentieth-century economists concluded that rationality has nothing to do with the *content* of people's preferences, only with their Logic. As the Latin maxim goes, *De gustibus non est disputandum*. The subjective theory of value sketched out by Pareto and subsequently developed by Hicks and Allen had finally left hedonism behind. But then, what does acting rationally imply? In ordinal utility theory, rationality requires that choices be *consistent* or *transitive* so that if A is preferred over B, and B is preferred over C, then A must be preferred over C (ibid., 92; cf. Sen 1987, 13-14). This account of rationality reached its climax with Samuelson's revealed preference approach, according to which acting rationally amounts to *choosing that combination of goods which is highest on one's scale of preferences* (Samuelson 1947, 97-98). As Morgan (ibid., 21, emphasis added) concludes, 'model man in this sense is no longer a perfectly distilled version of real man's [actual] economic behavior, but a *normative* model of economic behavior for real people to follow'.

Last, the axiomatic version of utility theory developed by Neoclassical economists in the 1930s and 1940s assumed perfect knowledge and perfect foresight. Thereafter, von Neumann and Morgenstern (1947) and Savage (1954) replaced the assumption of perfect foresight by (actuarial) risk and (measurable) subjective uncertainty, respectively. In the latter case, known as 'subjective expected utility' (SEU) theory, actuarial risk is replaced by subjective uncertainty defined as an individual's 'degree-of-belief' in the likelihood that a certain event will occur. In SEU theory it is assumed that an individual

compares the prospective consequences of various actions, assigns (subjective) probabilities to each of them, and chooses the option that maximizes her expected utility. As in the version of axiomatic utility theory with perfect foresight, utility is derived from a utility function that reflects an individual's preferences. The adoption of expected utility theory in applied work implied that Pareto's restrictive assumption that Economics only occupies itself with *repeated* actions was no longer necessary; there is no presupposition that beliefs are true. The only requirement of expected utility theory regarding beliefs is that they are revised according to a learning mechanism known as 'Bayesian updating'. This means that SEU theory is also a theory of rational belief; the axioms of rational choice under uncertainty require that 'degrees-of-belief' satisfy the axioms of Bayesian probability calculus.¹⁹ The basis for choice is Bayes' rule which holds that a rational individual will choose the option that maximizes her expected utility. Like ordinal utility theory, SEU theory may also be interpreted as a descriptive/explanatory theory of individual behaviour or as a (normative) theory of rationality, or both (Broome 1992, 277). SEU theory provides the apparatus used by rational choice theorists to extend the 'economic approach to human behaviour' (Becker 1976) to other social sciences. This extension has faced ferocious resistance by sociologists and anthropologists (much less by political scientists) and led to Boulding's coining the pejorative term 'Economics Imperialism' (Boulding 1969, 8). To conclude, the axiomatic version of utility theory, no matter whether it features perfect foresight or measurable uncertainty identifies rationality with transitivity of preferences.

5. Some remarks on the identification of rationality with preferences satisfaction

I argued above that welfarism is the most controversial element of the 'principle of utility' when it is interpreted as a theory of rationality. I also argued that Jevons (ibid.) expressed some caveats about the *commensurability* of different types of feelings which prompted him to circumscribe the application of the 'principle of utility' to the lowest rank of feelings and to elude the conceptual conundrums derived from interpreting it as a theory of rationality. Some commentators argue that the identification of rationality with the satisfaction of preferences is problematic, if not flawed (Sen 1987, ch. 2; Hausman and McPherson 1996, ch. 8; Broome 1999, 21-22; Scanlon 1993). They maintain that, as usually defined by economists, utility may not be strongly connected with one's good:

'But a person's utility, as officially defined, has no necessary connection with her good. So, nothing in the definition suggests that the preferred alternative is necessarily better for her. However, many economists adopt the official definition of 'utility,' whilst at the same

¹⁹ However, as Gintis (2018, 97) recognizes, expected utility theory 'says *nothing* about how individuals form their subjective priors or, in other words, their *beliefs*'.

time also using the word to stand for a person's good. Because an alternative preferred by a person is defined to have a higher utility for her, they take it for granted that it must be better for her. They suppose, then, that a person always prefers what is better for her' (Broome 1999, 21-22).

In other words, doing what I most prefer to do may, in some cases, go against my interests. Two examples may help illustrate this idea. First, let us assume that an individual smokes owing, for instance, to the pleasure and relaxation she derives from it. Preferences satisfaction implies doing what she most prefers which, in this case, consists of smoking. Is utility-maximization rational in this example? Seriously damaging one's health cannot be rational regardless of the nature of one's beliefs about its likely consequences. Second, rational choice theorists maintain that norm-violation may be rational if it increases one's expected utility (Opp 2013). The argument is that an individual will violate a moral norm if the pecuniary and non-pecuniary benefits she expects to obtain do exceed the emotional or psychic costs associated to norm-violation. The problem is that we know the emotional costs of violating a norm only after violating it. Remorse, guilt, and similar emotions are entirely felt after violating a norm and people often regret having violated a moral norm due to the guilt they feel in the wake of it. This means that, with the benefit of hindsight, an individual may conclude that her violating a moral norm was an error. This conceptual problem could have been averted had subsequent economists followed Jevons' advice to restrict the use of the 'principle of utility' to purely economic behaviour; after all it may be rational to exchange commodities or assets at market prices if it is mutually beneficial for the parties involved (see, also, Zafirovski, 2000).

6. Summary and conclusions

The starting point of this essay was the idea that terms like rational and rationality are loaded in the sense that they exhibit normative connotations. This means that, when we say that a person's behaviour is rational, we may not only be describing her behaviour. We may also be insinuating that she behaved as she *ought to* act. This two-fold interpretation of the term rational, namely, as a description of certain features of someone's behaviour and as a normative guide to desirable behaviour, tends to be conflated, if not confounded, by social scientists. Historians of economic thought are not immune to this problem either and it is not uncommon to find them using the term rational to characterize the behaviour of economic actors from Adam Smith onwards. In contrast, the central thesis of this essay was that the earliest use of

the term rationality in Economics, understood as a normative concept, can be found in the work of Robbins and Samuelson in the 1930s and 1940s respectively. In parallel, I argued that the idea that there is an account of rationality in the work of earlier Neoclassical economists is mistaken. The closest one gets to an account of rationality before the 1930s is Pareto's logical actions. However, I argued that Pareto uses the distinction between logical and non-logical actions to demarcate the scope of Political Economy, not to insinuate that people *ought to* be logical. The economists who antedated Robbins and Samuelson did not use the term rationality and, although they used the term Logic, they did so sparingly and apparently without normative pretensions.

The bulk of this essay was devoted to substantiating the above-mentioned claims by identifying three milestones in the process of emergence of the notion of rationality in Economics. The first milestone was Jevons' separation of Neoclassical Economics from Ethics and the emergence of his Science of Economics as a discipline which sought to emulate the rigour and objectivity of the natural sciences. I observed that Jevons was in a privileged position in the 1870s to formulate an account of economic rationality owing to his prior work on Logic and his mechanical analogy between mind and matter. However, he somehow eluded, deliberately or otherwise, identifying utility-maximizing behaviour with rationality. I conjectured that, if he had not done so, he would have concluded that rational individual behaviour is likely to be immoral in the sense that it is not aimed at maximizing the utility of the community in general. The second milestone was Pareto's reinterpretation of utility as a scale or ranking of preferences and its ulterior refinement by Hicks and Allen which laid out the foundations for ordinal utility theory. The third and last milestone was Menger's notion of economic goods and scarcity. The combination of these elements crystalized, in the work of Robbins, Samuelson, and their contemporaries, in the emergence of a conception of rationality defined as *consistency* or *transitivity* of preferences. The development of expected utility theory in the mid-1940s and early 1950s did not change the intellectual landscape significantly since rational behaviour continued to be associated to the transitivity of preferences. But the fact remains that this conception of rationality exhibits some conceptual problems, the most important one being, arguably, the identification of the good with preferences satisfaction. I discussed briefly some of these problems and concluded that, as in the case of ordinal utility theory, welfarism is the most problematic element of expected utility theory when it is interpreted as a theory of rationality. In such circumstances, social scientists would do well to follow Jevons' advice to restrict the use of the 'principle of utility' to purely economic behaviour.

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