



## Analysis

## Ecosystems, strong sustainability and the classical circular economy



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## ABSTRACT

In this article I argue that notions such as ecosystem services and strong sustainability can be best understood and developed within the theoretical framework advanced by the classical political economists, in which a circular conception of the economy is provided. I also argue that the development of notions such as ecosystem services and strong sustainability has been constrained by the dominance of neoclassical economics, which provides a linear conception of the economy and leads to an emphasis on weak sustainability, which in turn springs from an emphasis on substitutability and aggregate capital. When assessing the relevance of classical political economy for studying ecosystem services and strong sustainability I consider not only the contributions of the classical political economists, but also more recent contributions which draw upon the classical perspective, such as Piero Sraffa's and Amartya Sen's.

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## 1. Introduction

I argue in this article that the classical circular conception of the economy leads to the development of a theory of value that highlights important differences between natural resources and manufactured capital, which can be combined with a conceptualization of strong sustainability in terms of the irreversibility of natural capital. This is so because in the classical circular conception, the emphasis is not on substitutability and aggregate capital, as in the neoclassical linear conception, but rather on the different logic behind the valuation of natural resources on the one hand, and manufactured capital on the other hand. By highlighting the different logic of valuation of natural resources and manufactured capital, the classical circular conception enables the development of a theory of value that takes strong sustainability and the irreversibility of natural resources into account within the very analytical core of the theory.

The neoclassical linear conception, in contrast, leads to a theory of value where valuation depends on the relative scarcity of aggregate capital regardless of whether it is natural capital or manufactured capital, and thus ultimately entails a notion of weak sustainability (Pelenc and Ballet, 2015). Ecological concerns must then be incorporated, if at all, through ad hoc assumptions, rather than within the very analytical core of neoclassical theory.

Furthermore, the neoclassical conception measures value in terms of a subjective mental metric, which means that the valuation of ecosystem services is centred on their impact on subjective human preferences,

rather than in terms of their impact in the circular process of biophysical and socio-economic reproduction. The neoclassical subjective theory of value stands in contrast to the classical theory of value, where value depends upon objective entities like land and labour time, which are shaped by the possibilities enabled by the ecosystem's biophysical processes.

The classical circular conception has not been entirely abandoned after the emergence of neoclassical economics as the dominant economic theory. Walsh (2000, 2003, 2008) and Putnam (2002) identify two important stages in a revival of classical political economy within the twentieth century. The first stage was undertaken by Piero Sraffa, who focused on the analytical structure of the classical circular conception. The second stage was undertaken by Amartya Sen, who focused on the classical moral philosophy (see also Putnam and Walsh, 2012; Martins, 2013b).

Sen's contribution led to the capability approach (Sen, 1999; Nussbaum, 2000), which has been further elaborated by various authors after the pioneering contributions of Sen and Nussbaum, and several textbooks have been published (Comim et al., 2008; Deneulin and Shahani, 2009) which capture such developments. A particularly interesting direction in which the capability approach has been developed has been in connection to sustainability economics (Rauschmayer et al., 2011; Ballet et al., 2011; Martins, 2011, 2013a; Scerri, 2012; Birkin and Polesie, 2013; Ballet et al., 2013; Demals and Hyard, 2014; Lessmann and Rauschmayer, 2014) and ecosystem services (Polishchuk and Rauschmayer, 2012; Pelenc and Ballet, 2015).

Some of these contributions to the capability approach have focused on key notions to be elaborated here, such as the classical circular conception (Martins, 2013a), strong sustainability (Pelenc and Ballet, 2015), and the valuation of ecosystems (Polishchuk and Rauschmayer,

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2012; Pelenc and Ballet, 2015). But no contribution so far has provided a unified view of how those notions can be successfully integrated into a theory that takes strong sustainability and the constraints posed by the ecosystem's biophysical processes into account in its very analytical structure. Here I shall focus on this aspect, by showing the relevance of the analytical structure of the classical circular conception for understanding strong sustainability and the valuation of ecosystem services.

## 2. Ecosystem Services and Economic Theory

Ever since the concept of ecosystem services started to gain prominence in the academic literature (Ehrlich and Ehrlich, 1981; Ehrlich and Mooney, 1983), it quickly became a central notion in framing our attitude towards the environment (Norgaard, 2010). Within the vast literature that emerged, it became convenient to systematise the various types of ecosystem services. An important notion in this regard is that of *supporting ecosystem services*, which refers to the internal functioning of natural systems, including the various natural cycles of nutrients, water, and changes in soil and atmosphere, for example (Pelenc and Ballet, 2015). Supporting ecosystem services provide a viable habitat for various species, including the human species, leading to what can be termed as *direct ecosystem services* (Pelenc and Ballet, 2015). Ecosystem services are also sometimes classified according to various *functions* performed by ecosystems, such as the regulatory, habitat, production and information functions (de Groot et al., 2002).

The notion of ecosystem services has been instrumental in presenting Nature as a stock of capital that can provide only a limited number of services (Costanza and Daly, 1992; Norgaard, 2010). But its use in connection to neoclassical economics led to a tendency to the commodification and monetization of ecosystem services, where this tendency is related to the very evolution of economic theory, from classical political economy to neoclassical economics (Gómez-Baggethun et al., 2010).

There are various ways in which the adoption of the neoclassical theory of value constrains our ability to address adequately ecosystem services and strong sustainability. Firstly, the use of a subjective mental metric in neoclassical economics leads to the valuation of ecosystem services in terms of subjective preferences that may change, and may not reflect the biophysical constraints at stake. In the classical conception, in contrast, value depends upon objective entities like land and labour time, which stand in a close relationship with biophysical constraints. Secondly, the use of homogenous aggregate capital in neoclassical economics, while assuming that there is a high degree of sustainability between natural and manufactured capital, leads to the neglect of the specific problems posed by natural resources, and towards a concern with weak sustainability only. In the classical conception, in contrast, the differences between natural resources and manufactured capital are taken into account into the analytical structure of the theory, in a context where only natural resources are scarce, while manufactured capital is of an entirely different nature since it is reproducible. This aspect of the classical theory means that a notion of strong sustainability can be more adequately accommodated in the classical theory of value. Finally, the overall representation of the production process in neoclassical economics is a linear conception, where supply is provided in order to satisfy human demand, which is characterized in terms of non-satiable subjective preferences. In the classical conception, in contrast, human beings are part of a circular process of reproduction that takes place within the limits set by natural constraints.

This means that the classical circular conception provides a more adequate approach to the valuation of ecosystem services, to strong sustainability, and to the overall representation of the production process as part of the biosphere. I will now elaborate these claims in more detail. To do so, I will now explain how the theory of value evolved throughout the history of economic thought, and the implications of this evolution for our conception of ecosystems, and for how we approach the specificity of natural resources and its implications for strong sustainability.

### 2.1. The Circular Conception of the Economy of the Classical Authors

The term *classical political economy* was coined by Marx (1867), who defined it as a tradition of economic thought going back to William Petty, which has Adam Smith and David Ricardo as its key exponents. The conception of the classical authors pointed towards land and human labour as the source of wealth and value, as can be found in the writings of Petty (1899), who famously argued that land is the mother, and labour is the father of wealth.

But Petty also argued that we could measure human labour in terms of the quantity of land that is necessary for the subsistence of the labourer (for obtaining food, cloth and lodging) during the quantity of time in which labour is performed. This means that according to Petty, we can actually measure wealth in terms of the quantity of land available, that is, in purely objective terms, where land is the key reference point for the explanation of wealth. The quantity of land required for production provides an objective measurement of the cost of production. We can find the value of rent, which constitutes the surplus, by subtracting the produce of land necessary to sustain the labourer and the overall activity of production, from the total produce of the land.

Richard Cantillon, drawing on Petty, also focuses on land and labour, and argues that land is the matter and labour is the form of wealth (see Berg, 2015). And like Petty, Cantillon also notes that we can measure labour in terms of the land necessary to sustain the labourer. That is, Cantillon also provides an approach where we can study wealth focusing on land as the key reference for measuring wealth and value. But Cantillon argues that we must go beyond the mere measurement of wealth, and look at the causes of wealth, while criticizing Petty for focusing on effects and failing to understand causes.

The topic of the causes of wealth was further developed by François Quesnay, whose key contribution, the *Tableau Economique*, contains many similarities to Cantillon's approach. Quesnay argues that land is the origin of the surplus. In particular, Quesnay sees agriculture as the only sector that produces more than what it needs to reproduce itself, that is, it is the only sector which produces a surplus, which can be found as rent. Quesnay sees artificers, manufacturers and merchants as unproductive classes, who merely reproduce whatever capital they receive. Farmers and country labourers employed in agriculture, in contrast, do not merely reproduce, but also generate a surplus, which appears in the form of rent. Quesnay provides the first systematic description of the economy as a circular process of reproduction, in which agricultural work on land is the basis for wealth and prosperity.

Smith (1999[1776], pp. 388) wrote that Quesnay's economic theory is probably the nearest approximation to truth that had ever been published in political economy. However, contrarily to Quesnay, Smith argues that it is not only agriculture, but also other sectors, that contribute to the economic surplus, through the division of labour. Smith notes that in more primitive communities, we can see more clearly the contribution of the labour of an individual to the value of the commodities produced and used by the individual. But as the division of labour becomes more complex, it becomes very difficult for an individual to produce all commodities needed. Therefore, many commodities will have to be purchased in a market, and the labour one can command becomes the more appropriate measure of value, which denotes the power an individual has to purchase the labour of others.

Smith's conception leads to a switch of emphasis from land to labour as the source of value, as Gómez-Baggethun et al. (2010) also note. This leads, in turn, to a conception where the emphasis is on the human efforts and power to control natural elements and other individuals (whose labour can be purchased). In fact, Smith (1999[1776], pp. 37) cites approvingly Thomas Hobbes's claim that wealth is power, that is, the power to purchase the labour of others. Smith notes that corn provides an approximate measure of value in the long (or indeed secular) period, but he also argues that labour commanded provides a more exact measure.

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