



Circular Economy and Economic System

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Opinion

The current state of production, often associated with environmental degradation, has traditionally been addressed through the lens of conventional economics. This approach treats environmental issues as negative externalities, with solutions focusing on identifying optimal remediation costs, efficient environmental tax rates and subsidies, and promoting clean technologies. However, a novel and intriguing alternative to these solutions is the Circular Economy (CE) perspective. This perspective seeks to harness the benefits of material waste and byproduct recycling by fostering intricate interconnections among industries and consumers [1].

One of the key objectives of the CE is to extend the lifecycle of non-renewable resources used in production and discarded in consumption. This perspective has been enriched by numerous articles on practical examples of business enterprises, in-depth discussions on the concept, and study methods for analyzing and evaluating the approach [2-4]. The CE has been presented as a critique of linear economic models that prioritize consumption. However, a more comprehensive perspective is to view the CE as an integral part of the economic system. In this analogy, just as a drop of seawater contains fundamental information about the sea, so does the circular economy within the economic system (ES).

The dependency of the CE on the ES is, in turn, the element that enables sustained growth and a virtuous cycle that acts as an endogenous component of the CE. Considering the lifespan of renewable inputs allows the production of recycled goods independently of new products. Thus, modeling the CE from the ES

perspective involves incorporating it into the productive structure, as there are interrelationships between recycling industries and industries producing new goods. However, the productive structure of the CE has a growth factor that depends on the durability of the recycled input.

The CE can be studied using the Leontief model, considering two regions or two groups of sectors [5,6]. The purchases and sales between CE sectors and the structure are homogeneous and of degree one; however, with recycled input, new production can be repeated without using new inputs. In this sense, although the substructure of the CE is homogeneous and of degree greater than one, it contains a vector with values from zero to one corresponding to the lifecycle of the inputs. Hence, each repetition of the reuse of inputs tends toward zero.

Being a part of the productive structure, the CE also depends on final consumer demand. However, the CE goes beyond being an environmentally friendly growth strategy; it shows that recycling is an element that allows for increasing returns to scale, explained not by factor productivity but derived from the lifecycle of recycled inputs. Thus, in addition to factor accumulation, resource reallocation, increasing returns, and technological change, development requires the efficient use and recycling of renewable and non-renewable natural resources.

Although data on the CE from a structural approach are lacking, its study can be grounded in the Leontief model [7], which analyzes the connections between sectors through the purchase and sale of inputs and outputs and incorporates economic agents when

they receive income and make expenditures. With such data, civil associations, the government, private enterprises, families, and the external sector can work together to promote sustainable production and environmentally friendly consumption by recycling of waste from consumption and production.

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Conflict of Interest

None.

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