The Circular Economy and Institutional Economics: Compatibility and Complementarity

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Abstract: The notion of a circular economy (CE) developed out of the work of Kenneth Boulding and others concerned about Earth's limited resources and its capacity for regeneration. The concept has recently become the heart of an economic perspective influencing governments, companies, and researchers. Core topics examined by those researchers include resource use, economic value, and systems thinking. The CE literature and the tradition of institutional economics (IE) have important elements of compatibility and complementarity, which this article examines. There are also opportunities for CE and IE collaboration.

Keywords: circular economy, institutional economics, resource use, economic value, systems thinking

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A growing number of scholars and practitioners stress the notion of a "circular economy" (CE) as an alternative to the unsustainable notion of a "linear economy" (based on the idea of "take, make, and dispose"). This article surveys the origins, recent applications, and core topics related to the CE concept. It also explores the compatibility and complementarity of the CE literature and institutional economics. The article closes by suggesting a direction for collaboration among institutionalists and CE scholars.

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The Circular Economy

Over the past decade, increasing numbers of scholars — in fields such as design, sustainable innovation, and especially industrial ecology — have incorporated a CE perspective into their work. That perspective is both descriptive and normative. On the descriptive side, the CE perspective sees economic systems as containing closed loops of material resources. On the normative side, it encourages economic gains through reuse of products and resources — decreasing the need for waste disposal and extraction of new resources.

Origins

The CE perspective can be traced to the mid-1960s, when economist Kenneth Boulding (1966) described Earth as a spaceship "without unlimited reservoirs of anything, either for extraction or for pollution." According to Boulding, most people think in terms of what he called a "cowboy" economy, while what is needed is the conception of a "spaceman" economy. In the standard view, humans can afford to use resources recklessly because supplies appear limitless; in the other, Earth is a single spaceship and we must find a way to live within its closed ecological system.[1]

Boulding stressed that a closed system is not the same as a static one. He emphasized that spaceship Earth is capable of continuous material reproduction. The key is to recognize that the process requires an ongoing supply of energy input and to live within the system's capacity to function in a cyclical manner.

Boulding also maintained that his perspective led to the need to ground economic life in new operating principles. Thus, he laid out the following:

- The state of human health and well-being must be vital metrics of economic performance, and well-being cannot be viewed in terms of consumption alone;
- Maintenance of our planetary stock of resources (existing material, physical capital, and human resources) should be a key concern, not maximization of production and consumption; and
- Resource scarcity suggests that production and consumption — "throughput" — should be minimized, not maximized, and that technologies resulting in stock maintenance with less throughput should be encouraged (Boulding 1966).

The CE viewpoint also builds on *Jobs for Tomorrow* (Stahel and Reday-Mulvey 1981). It called for extending the service life of a wide variety of products, ranging from automobiles to buildings. The book's authors emphasized the waste of resources associated with product disposal rather than repair, reuse, and recycling. They also highlighted the job-creation opportunities accompanying product-life extension, since labor is usually substituted for other forms of energy and resource inputs when a product's service life is extended.

A third source of the CE perspective is *Economics of Natural Resources and the Environment* (Pearce and Turner 1990). It emphasized the linkages and interaction of the economic system (a social system) and the natural systems of our planetary environment. Among the linkages are three economic functions of the environment: it supplies resources; assimilates waste (turning much of it into harmless or even useful forms); and represents a source of utility. The interaction, meanwhile, involves a circular relationship: "Everything is an input into everything else" (Pearce and Turner 1990, 37).

Like Boulding, Pearce and Turner see the economy and the environment as part of a closed system — a single planetary ecology — requiring new rules to ensure sustainability over time. They write: “Simply saying that the end purpose of the economy is to create utility, and to organize the economy accordingly, is to ignore the fact that, ultimately anyway, a closed system sets limits, or boundaries, to what can be done by way of achieving that utility” (Pearce and Turner 1990, p. 37). Their new rules are the following:

- Do not reduce stocks of natural resources at rates that exceed their regenerative capacity;
- Keep within “planetary boundaries” or environmental thresholds that are vital for global sustainability (for more recent work on this subject, see Rockstrom et al. 2009); and
- Balance the amount of waste we dispose with the environment’s assimilative capacity. (In fact, Pearce and Turner, among others, sometimes refer to the CE concept as a “materials balance” approach to economics and the environment.)

Recent Applications

The CE perspective has recently gained popularity as a way to approach many of the “wicked” problems facing today’s world, including growing population, depletion of resources, and increased pollution (Lacy and Rutqvist 2015, 4). As a result, that perspective, which has become increasingly associated with the growing field of industrial ecology, has garnered increasing attention not only from scholars (whose work is discussed further in the next section) but also from governments and businesses. For example, China has committed itself to the normative aims of CE

(Yuan et al. 2006) and the European Commission (2015) recently stressed that a circular approach to economic activity is essential to achieving a more resource-efficient Europe.

At the enterprise level, CE thinking has inspired a growing number of companies to upgrade, refurbish, and remanufacture existing products (Mont et al. 2017). It also has led enterprises such as the Dutch technology company Philips to redesign products, packaging, and even their business model (a change signaled by the launch of Philips Lighting Service in 2009) (Lacy and Rutqvist 2015; McDonough and Braungart 2013). In addition, the Ellen MacArthur Foundation, a nonprofit based in the United Kingdom, has championed CE worldwide by supporting research, policy development, and business partnerships since 2010 (Webster 2017; Ellen MacArthur Foundation 2016).

Core Topics

Today, CE has many definitions and interpretations and the associated literature has many streams (Kirchherr et al. 2017). Still, much CE research and attention revolves around three topics: (1) resource use; (2) economic value; and (3) systems thinking.

Resource Use. Achieving a more sustainable use of resources has been a key thread in the CE literature since the days of Boulding. According to McDonough and Braungart (2002), products should be designed from the outset so that when they are no longer useful they provide nourishment for something new. One form of nourishment comes from what they call “biological nutrients,” the result of inputs involving plants and animals, and the other form is what they call “technical nutrients,” inputs involving minerals and metals.

Most CE research on resource use has focused on technical nutrients. In addition to emphasizing a *reduction* in the initial use of such resources (as a result of product design as well as reduced production), CE researchers stress a "cascade" of cycles that include *repair*, *reuse* by others, *refurbishment*, *remanufacturing*, and *recycling* (Webster 2017, 19). In the case of biological nutrients, material *recovery* for use as fuel is still another cycle (Parto et al. 2007).

Economic Value. Much CE research also focuses on creation of economic value. For example, a recent study by the McKinsey Center for Business and the Environment (2016, 2) celebrated the possibility that adopting CE principles of resource use (in ways that range from redesigning homes to introducing car sharing) could generate a net economic benefit of €1.8 trillion by 2030. The CE literature also demonstrates a business case for repair, reuse, and recycling. Companies often think "take, make, and dispose" is the only way to profitability, but case studies show that enterprises that take a more circular perspective can also prosper (see, for example, Whalen et al. 2017; and Mont et al. 2017).

Many with the CE perspective assume that repairing or refurbishing a product generates more economic value and contributes more to the goal of reducing resource use than does recycling. However, neither assumption is always true. To be sure, when products are reused or remanufactured instead of recycled, more of the product's added value often stays with the product or components (Nasr and Thurston 2006). But market factors also influence the viability of such approaches. For example, Stahel and Reday-Mulvey (discussed previously) may have been right about the job-creation opportunities associated with extending the life of products, yet labor costs —

especially when workers are paid a living wage — cannot be left out of the equation and often make repairs prohibitively expensive (Whalen et al. 2017).

The irony is that some CE contributors focus so much on economic benefits that they lose track of the original aim of sustainable resource use, while others focus so much on the potential for environmental gains that they forget to include market forces in their models and analyses. In fact, the economic value discussed in studies such as that of the McKinsey Center is often an efficiency gain, not the creation of new value (though it's certainly possible that efficiency gains could provide an opportunity for creation of new value), and CE researchers don't always consider whether efficiency improvements might lead ultimately to increased consumption and thus to more adverse environmental outcomes.[2] At the same time, markets — which play a critical role in determining both the economic and environmental effects of applying CE ideas — are rarely incorporated into CE conceptualizations (for an exception, see Figure 1). There is clearly more work to do on this core topic.

Systems Thinking. The problems of resource use and sustainability that confront us on spaceship Earth cannot be solved by reductionist logic that breaks each difficulty into as many parts as possible (Greyson 2016). Thus, the CE perspective seeks to tackle problems by looking holistically at complex systems and their interaction — and strives to conceptualize our economic system within the context of the natural system that binds all life, air, water, and matter on Earth. From the vantage point of CE, the economic system is an inescapably integral part of the ecosystem (Webster 2017. 173-183). In short, systems thinking is at the core of the CE concept (Lehmann et al. 2014).

Of course, not all research and practice can be global in scope. As a consequence, in addition to keeping in mind the notion of "think globally, act locally," researchers and practitioners with a CE perspective think in terms of cascading and interrelated cycles — with human and non-human dimensions — while working most often at the local and regional levels (Ellen MacArthur Foundation 2016). But essential common threads in that local and regional work include a view of the world in which everything is interwoven with everything else, and rejection of a linear notion of production. We aren't living on limitless plains; we can't just "throw things away" — because there is no *away*.

Compatibility and Complementarity With Institutionalism

A look at CE and institutional economics (IE) reveals compatibility in at least three ways: they share a common purpose; they have the same general approach to looking at economic life; and they are both grappling with important questions about economic value. Each tradition also has strengths that the other tradition could benefit from building upon.

Compatibility

CE and IE have the same overall purpose: to understand and help resolve important, real-world economic problems. Wesley Mitchell, a leading early figure in the development of institutionalism (alongside others including Thorstein Veblen and John R. Commons), stressed there should be only one reason for economics: "to make this world a better place in which to live" (quoted in Ramstad 1993, 173). Edwin Witte (1954, 133), a student of Commons and an important institutionalist himself, also put

the study of practical problems at the heart of institutionalism. In fact, in an article widely considered the source of the term “institutional economics,” Walton Hamilton (1919, 312-313) emphasized that IE aims to be “relevant to the modern problem of control,” by which he meant that the notion of laissez faire had outlived its usefulness and should be replaced by sensible economic management (addressing vital matters such as how to structure and organize markets). In short, IE — like CE — aims to be an instrument that helps us to understand and resolve major challenges including resource depletion, environmental degradation, economic development, and sustainability.

CE and IE also have a common approach to looking at economic life. Both stress the need to focus on systems and processes. Like CE, IE sees economic systems as linked to, embedded in, and inseparable from other social and natural systems: a stress on interdependence, holism and systems thinking has always been evident in institutionalism (Adkisson 2009a and Wilber and Harrison 1978). So has an emphasis on constant change, circular (or cumulative) causation, dynamic interaction, and systems evolution — on *process* without a predetermined end (Kapp 1976; Myrdal 1978; Mayhew 1987). What Hamilton (1919, 315) said of IE long ago remains true for IE and CE today: “We need constantly to remember that in studying the organization of economic activity in general as well as in particular, we are dealing with a unified whole which is in process of development.”[3]

Serious efforts to grapple with economic value represent another common feature of CE and IE. While standard economics usually equates value with prices and market outcomes, institutionalism (like most CE research and the CE tradition overall)

has always considered economic value to be much broader and more complicated. And, like CE, the literature of IE contains different approaches to value — including "instrumental value theory" and "reasonable value" — and efforts to integrate (or at least reconcile) those approaches (see, for example, Atkinson and Reed 1990).

Complementarity

CE and IE are complementary in that each tradition has strengths worthy of further attention by the other. In the case of CE, an important strength is its focus on resource use. In the case of IE, a major strength is its attention to institutions.

Perhaps the main strength of CE is its attention to the environment, sustainability, and resource use. To be sure, institutionalism has not ignored these matters (see, for example, Swaney 1987; and Greenwood and Holt 2016), but for decades they have had to compete for attention alongside a myriad of topics. Thus, the focus of CE — especially its attention to the many "r's" of resource use (reduce, redesign, repair, reuse, etc.) — is a valuable complement to IE.

The key strength of institutionalism, meanwhile, is its attention to institutions. That focus has been central to IE from the start, when Hamilton (1919) argued that studying institutions — not merely as static entities, but as part of an ongoing process of socioeconomic change — was the only way for economics to remain relevant to real-world problems. For institutionalists, institutions are not merely social structures (ranging from intangible ones such as "the market system" to more tangible ones such as banks and corporations). They are also the norms and patterns of behavior underlying and promoted by those structures, which means the study of institutions is ultimately about culture and cultural evolution (Mayhew 1987). Moreover, culture

encompasses both science and ceremony, and it affects and is affected by the natural world. Institutionalists have been wrestling with all of this for a century, and CE would certainly benefit from some familiarity with those efforts.

Of course, diving into the institutionalist literature isn't easy, but Adkisson (2009a) offers one place to start. Like the CE distinction between technical and biological nutrients, Adkisson distinguishes between technical and natural processes. Then he highlights the role of institutions (both as mechanisms and processes) as *coordinators* of the interaction of technology and nature. As Adkisson stresses, extraction, production, consumption, and disposal —indeed, all aspects of social provisioning — are processes governed by social institutions. He also stresses that everything influences everything else: the physical environment, culture, and existing technology affect social institutions at the same time that institutions affect those spheres.

Adkisson also discusses the challenge of finding the "right" institutions. That challenge not only puts attention on institutional evaluation and design, but also sparks a discussion of economic value and the role of government. Adkisson concludes by suggesting that the "social fabric matrix" of institutionalist F. Gregory Hayden provides a relevant framework for research and policy analysis on matters of sustainability and development (a subject he develops further in Adkisson 2009b). Thus, Adkisson provides a good introduction and point of departure for those willing to venture into IE from CE.

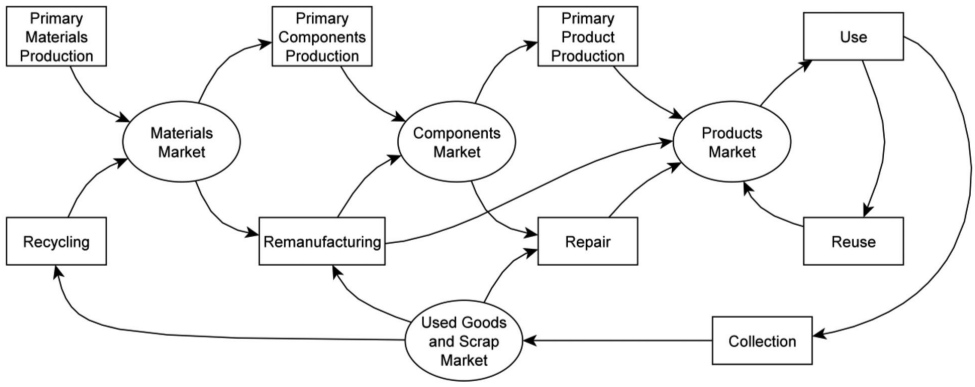
Conclusion: Opportunities for Collaboration

The foregoing hints at many opportunities for CE and IE collaboration. We close with one ambitious example: the possibility that an alliance of CE and IE scholars could fashion a new institutional economics of sustainability. Such an economics would look at multiple dimensions of sustainability and development, giving attention, for example, to humans, society, resources, technology, the environment, and economic growth. The existing work of CE and IE already has much to contribute to that economics, as does the work of many others (such as James 2015; and of course, we should take care to recognize the literature of ecological and environmental economics).

CE and IE have a lot to talk about. Let the dialogue begin.

Figure 1. Incorporating Markets into the Circular Economy Perspective

Source: Zink and Geyer (2017).



Notes

1. To be sure, since the sun is a vital source of energy for the planet, spaceship Earth is not an entirely closed system.
2. For research questioning the environmental impact of innovations driven by the economic case for CE, see, for example: Herring and Sorrell (2009); and Zink and Geyer (2017).
3. It may seem that CE and IE are separated by focusing on "closed" systems vs. "open" systems, respectively. But that reflects different initial starting points, not a fundamental difference in outlook. Beginning from a global vantage point, CE stresses that our planetary systems are closed in that we are all aboard spaceship Earth. In contrast, because IE originated as an alternative to the market-centric approach of conventional economics, IE has long stressed that real-world economic systems are more open than standard theory recognizes (Adkisson 2009a).

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