CIRCULAR ECONOMY - THE PREMISES OF BUSINESS MODELS CIRCULAR

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Abstract:

In this paper, we propose to review the theory of the implementation of sustainable business models of the last generation to profit in the circular economy. The circular economy model has become more and more important in recent decades as a replacement model for the classical, linear economic approach, in which products are manufactured, used and then disposed of, with a significant loss of value, due to the depletion of classical material resources, the need to protect the natural environment and develop sustainable businesses. The success of the circular economy concept involves all three dimensions of sustainable development - economic, environmental protection and social dimension, with sustainability being the subject of corporate reporting.

Keywords: *circular economy, sustainability, business models*

JEL Classification*: Q01, Q50*

Introduction

The idea behind the circular economy is that companies have a responsibility to uphold the environmental and sustainable values of society and must answer to stakeholders rather than just their closest shareholders. This has led to research into ways in which management can extend and rethink the traditional make-use-dispose business model. Despite criticism of this view and debate over whether it is realistic to expect firms to venture beyond shareholder interests when developing their business models (to close resource loops and achieve the full material cycle) a growing number of researchers hope that such a transition can address the biggest challenge facing society today. The focus of these discussions has evolved from simplistic arguments about why the circular economy is good, to understanding some theoretical views of the financial results regarding the implementation of circular business models.

In the scientific literature, the circular economy has been developed through research conducted outside the tradition of management and organizational theory, with a primary focus on recycling and waste management, which have traditionally been managed by non-profit organizations. A review of the literature shows that few specialists in strategy, organization or management have used the concept of the circular economy. They focused on describing different circular business models, innovations in circular business models and certain challenges and uncertainties companies face when adapting to the circular economy.

Some recent reports have indicated that very few companies have been able to transform their businesses to compete in the circular economy. The question is why firms cannot transform to compete with business models that are based on the circular economy, and could such a transformation lead to differences in behavior and profitability? Based on these insights, we outline the fundamentals of circular business models and offer a number of insights to explain why circular business models can be profitable and how they can influence competitive advantage.

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1. Definind circular business models

Definitions of what a business model is vary in the literature, but most researchers agree that a business model describes how a company creates and captures value. The characteristics of a business model define the customer value proposition and pricing mechanism. It also indicates how the company organizes itself and with whom it collaborates to produce value, and specifies how the company structures its supply chain. The business model allows the firm, together with its partners, to create value and to appropriate some of that value.

Industrial and technological development, along with global trade, has led to economic growth that has increased human well-being over the past century. However, this development path is rooted in the exponential growth of resource use. The circular economy is essentially an environmental change in response to the global need for a green economy, which requires human economic activities to be consistent with the principles of the three R's: reduce, reuse and recycle. Companies need to replace the linear take-make-waste model with a circular model based on reused, recycled or repaired materials and products.

In a circular economy, closed material loops are a prerequisite, which implies that materials are reused as bulk materials, products or components. Whenever feasible, reuse and remanufacturing are preferable to recycling for economic reasons, as much of the value added in the original manufacturing process remains in the components. In this context, a circular business model is designed to create and capture value while helping to achieve an ideal state of resource use (e.g. finding a model that most closely resembles nature and that approaches of achieving complete material cycling). So the purpose of the business model shifts from making profits through the sale of products or artifacts to making profits through the flow of resources, materials and products over time, including the reuse of goods and the recycling of resources. Thus, companies can reduce the negative impact on the environment by providing and capturing value by proposing alternative value. However, achieving such a transformation requires close collaboration and coordination between actors in industrial networks to achieve tight or slow material loops. Based on these perspectives, the circular business model definition explains how a firm uses innovations to create, deliver and capture value by implementing circular economy principles, whereby business rationality is realigned across the network of actors/stakeholders to achieve benefits of environmental, social and economic.

For example, in Europe, the European Parliament approved a circular economy package that includes a series of political measures and actions to reduce waste. Targets have been set for EU member states for the recycling of materials, including packaging, plastic, wood, ferrous metals, aluminum, glass, paper and cardboard.

2.The structural influence of the circular economy and models of circular business

One perspective that can help elucidate the management challenges associated with circular economy implementation is based on the conceptualization of environmental change and the need for structural adaptation through realignment to fit the environment. Changing business models is the main way companies manage alignment or realignment.

From this perspective, management and companies must create/enhance value by configuring/reconfiguring new or existing resources. Companies are rethinking how they pool resources and constantly redistributing internal resources to become congruent with environmental demands and conditions. This typically requires a shift to a circular business model with large upfront investments and longer time horizons for revenue generation. These requirements lead to challenges for companies, as they may need large capital reserves to "wait for the money". Also, shareholder approval can be difficult to obtain because this

approach does not fit the short-term time horizon of shareholders. Studies have shown that although the costly and risky implementation of circular economy principles is not implemented, managers are intrigued by the perception of growth potential and an increased need to manage market turbulence by adapting circular business models.

Slow implementation of a circular business model is inherent in established firms due to organizational inertia and resistance to radical transformation. More specifically, while managers in companies that continue with the linear model can plan and predict their future based on historical data, for managers in firms that move to a circular business model, the value in making a future forecast is limited. Limits on resource and energy use and the importance of targeting value creation in terms of closing loops (i.e., seeing the world as a "system" in which waste is minimized) underpin the rationale of the circular economy. The implications of this reasoning are significant: many companies may need to change their entire value chain. In this context, one of the most complex challenges is establishing and organizing the activities of the reverse value chain, which covers all the activities of the firm, from the return of the products to the potential recovery of the maximum value of the products through recycling and up cycling activities. Therefore, companies are slow and managers hesitate to make pioneering changes. On the other hand, moving to a circular model can offer enormous opportunities, including cost savings through reduced waste, better supply chain management, and lower sensitivity to resource price volatility, and better customer relationships. The shift to a circular economy also boosts innovation, creates jobs and benefits the environment. Consequently, since structural alignment decisions are made at the top level, the creativity, ability and commitment of top managers are highly relevant factors for research examining the shift to circular business models.

3.Transaction costs and contracts between partners for circular business models

Uncertainties surrounding the circular economy mean that firms risk facing unforeseen and high contracting costs because they cannot contract partners, lack the competence to formulate contracts detailed enough to secure their interests, or enter into complex contracts because they cannot visualize the challenges they will face during the transition. Therefore, transaction cost theory is particularly useful for understanding how partners and collaborators design contracts to secure mutual benefits. Transaction cost theory can help us understand how companies can successfully close material loops and develop close collaborations. These collaborations enable companies to address adaptation and pressures arising from sustainability concerns and increased environmental responsibilities together with partner companies in the value chain. The extent to which companies can learn how to specify circular transactions, reduce high contract costs, and develop contracts specific enough for the circular economy may determine how successful they will be in creating value in these new economic conditions. It is imperative for management to understand the supply chain as well as its parts (i.e., individual companies and their relationships) when implementing circular economy principles such as recycling and extended sustainability services.

Moving from a linear business model to a circular one with increased efficiency, recycling and sustainability may require investment from all parties involved in a given company's collaborative network. As all parties coordinate their efforts to make relationship-specific investments whose value depends on the success of the collaboration, this mutual commitment should reduce the risk of selfish behavior by the parties and mitigate the need for firms to use collateral to protect their interests. Thus, circular networks can reduce transaction costs resulting from the implementation of contracting and control mechanisms.

For manufacturers, the first step is to redesign products so that they are suitable for remanufacturing. Products should be designed with environmentally friendly raw materials, parts and components, and product design should facilitate easy disassembly for reuse and recycling. The importance of design is not only about product features, but also about minimizing energy and resource consumption during production. According to the Ellen MacArthur Foundation guidelines, a basic principle of the circular economy is that products should be designed so that there is no waste, meaning that products should be designed and optimized for a cycle of disassembly and reuse. For the manufacturer, capital tied up in physical investments such as factories and remanufacturing facilities carries considerable risk. As the initial investment for remanufacturing products is considerable, larger firms with access to resources are more likely to meet the criteria of the circular economy. In addition, effectively addressing the challenges that may arise with the implementation of a new circular business model will likely prove difficult due to contractual uncertainty. Parties that cannot provide all the details in a contract will have to include penalties or rewards to account for disturbances that may arise in order to avoid drawing up exhaustive contracts. Therefore, larger firms may have advantages in setting the contractual agenda and participate in the most significant parts of the shift to a circular business model. While small and medium-sized enterprises (SMEs) can enter (often global) value chains and realize the benefits of the circular economy, they must meet the requirements that larger companies specify in their contracts. However, due to the adaptive limitations of contracts, the uncertainty associated with the circular economy and the difficulty of designing ex-ante profitable circular business models, a joint steering committee consisting of companies that have joint authority over a limited number of activities could provide an alternative when non-dominant companies are involved in creating new collaborative systems to implement a circular business model. Thus, to understand the extent to which companies successfully transition to circular business models it is important to consider the characteristics of partners, contracting possibilities and the ways in which companies adapt to uncertainty and prevent potential disputes through contracts and contractual devices.

4. Resource based influences and circular business models

The companies adapt to changing requirements, trends and environments by reconfiguring resource portfolios. Studies have shown that firms face difficulties in changing resource portfolios because they limit the directions for new investments. A firm's management must constantly assess, measure, and reconfigure the firm's resource portfolio in response to market and societal needs, social changes, and technological advances. A company can configure its resource portfolio by adding, combining or replacing new resources with old ones.

Consistent with the scale of change, the few studies that have examined the circular economy have suggested that to manage and overcome the challenges of the return flow, producers often need to rely on the capabilities and resources of their partners. Here, however, the entire circular system can collapse if only one partner in collaboration fails to meet its contractual obligations. This risk is particularly strong for business models that focus on:

- resource recovery through industrial symbiosis and closed-circuit recycling (through which waste is reprocessed into new resources);
- extending the life of the product through remanufacturing and reuse.

A circular business model requires multiple types of resources and capabilities that focus on collecting or sourcing otherwise wasted materials to transform them into new forms of value, or that focus on designing long-lasting goods and extending their lifespan product life. Firms need to invest in flow tracking technology to collect information about the location and status of product returns as well as the product lifecycle. Accurate information on the timing and quality of product life cycle status or returns is necessary to manage return flows, especially

when rates of return are high or when life cycle contracts are the core of the value proposition. To ensure high return rates it is important to determine how to collect used products, by whom and where collection points should be located to ensure customer coverage. After the collection of used products, recovery may involve reselling, remanufacturing or recycling the products through a series of processes such as collection, inspection, separation, etc. Therefore, for a circular business model to succeed, it is important that investments in financial, human and physical resources are aligned with the information technology used in the reverse logistics process to improve communication with partners, to integrate information into the company's activities and to improve responsiveness.

In circular business models, where ownership of the product is retained, customers only access the product at the time of purchase. This type of product-service offering consists of using or receiving the output of the product (customers could, for example, rent physical products, such as paying for access to a bicycle). The adoption of such models increases the importance of complementary services and resources to extend the life of the product. Many manufacturers employ independent service agents to perform warranty maintenance under a properly drafted contract. This approach creates the opportunity to invite collaborators to develop resources and thereby participate in the co-creation of value. After-sales services include installation, warranties, extended warranties, maintenance service contracts, spare parts supply, training programs and product upgrades. When post-service activities are outsourced, manufacturers and service providers must align their interests. After-sales services are also important in situations where products are disassembled and usable items are cleaned, repaired and inventoried. Recovered parts thus become an alternative to new parts. So, when making investments to replace a linear business model with a circular one it is important for firms to consider the resource requirements that relate to after-sales services. Because these investments help ensure customer satisfaction and create long-term relationships that involve periodic payments, they play an important role in making businesses sustainable. Consequently, after-sales requirements must be integrated into the innovation process to ensure that product specifications enable professional after-sales services.

The need for investments and adjustments to achieve the closed material loop as well as the transformation to the circular business model varies according to the nature of the activity, requires significant changes and costs of the company. This is due to the need to introduce radical innovations to meet today's challenges. Large companies are in the process of changing from a linear to a circular business model. By adopting the circular business model, these corporations can use sustainability-oriented actions (egg, product redesign, increasing product life, and adding recycling functionality) as measures to achieve improved reputation and increased revenue.

Moving from a linear to a circular model can be difficult for a firm if its value chain collaborators are not willing to make the necessary investments and adjustments. Substantial switching costs could be involved in changing business models. Creating a circular business model can be a first step towards dissolving previous alliances. In other cases, this transformation requires those companies to improve their material selection and change their current supply to non-toxic, pure raw materials. Consequently, the decisions of manufacturing companies regarding product design and choice of materials influence the selection of network partners.

5. Industry and structural influences in circular business models

The implementation of the circular economy involves the formation of new markets understood as early stage business environments where companies offer and compete with a new type of business model based on the search for profits from sustainable alternatives. These business models involve substantial uncertainty regarding profitability. The type of markets in which

firms compete may have an unclear industry structure, unclear or absent definitions of "product," and a lack of logic to guide actions and identify appropriate behavior.

Despite the uncertainty surrounding industry structures emerging from sustainable disruptive innovations, some potential effects can be foreseen. One of the most prominent trends resulting from the transition to a circular business model is the reuse and recycling of assets. If reused materials are just as valuable or have a higher and more durable value due to up cycling, manufacturers will switch to reused materials as long as the prices do not differ substantially. The presence of substitutes affects the competitive intensity within an industry, to the benefit of producers who have greater bargaining power. If the mission of manufacturers is to reduce waste, suppliers of raw materials that do not adapt to changing trends may struggle to survive in the market. In industries that are severely affected by the challenges associated with resource scarcity and increasing demand, suppliers may have to increase the price of reused materials. In the long term, minerals, metals and energy sources must be replaced by renewable alternatives.

For the sake of profitability and "survival" of the industry, innovations become the main factor in finding solutions for the constant supply of the necessary materials (for example, 3D printing technology in production that allows manufacturers to use a just-in-time production model versus just- in-house). This development led to demand-driven production, smaller batches and less need for excess inventory, all of which reduced resource requirements. The optimal use of resources in production strengthens the bargaining position of manufacturers in relation to material suppliers, and the decreasing demand for materials due to technological improvement decreases the dependence of manufacturers on suppliers.

The short-term effect of the transition to circular business models is the outsourcing of reverse logistics operations from manufacturers to third-party suppliers. These mainly include: transportation, warehousing, inventory, value-added services, information services and supply chain reengineering. New types of industrial structures, which are characterized by concentration and market power, influence network relationships, firms' network positions, and industry performance.

If a manufacturer's redesign of a product differentiates it, collaborators in the reverse supply chain may be required to develop unique expertise, for example, to disassemble, inspect, and repair used products. In other words, the shift from a linear to a circular business model may also require substantial investment from third-party service providers. High investment requirements create barriers to entry into the manufacturing circuit, which limit the number of potential collaborators, which may make a manufacturer selective when establishing business alliances. Thus, the transition to a circular system can result in industrial structures with a high degree of concentration, meaning that the industry is dominated by a fairly small number of actors in its early stages. In highly concentrated industries it is important that actors in the network build and maintain collaborative relationships because mutual dependencies are significant. Therefore, the shift to the circular economy can lead to industries with strong links between companies. Typically, high industry concentration with a small number of companies connected by a network of intra-firm ties tends to lead to high industry profitability. At the same time, companies that address the challenge of doing business in the circular economy by building strong and close positions in emerging industries and markets are expected to succeed.

There are other significant differences in circular economy implementation between manufacturing firms. In their circular designs, some manufacturers have focused on modularizing their products and components to facilitate their disassembly and repair for reuse. This approach implies that firms use the same products or components in different product categories, thus leading to more homogeneous products. In this case, it is much easier for manufacturers to find third-party service providers who can disassemble and inspect used

products, since the requirements for doing so in terms of training; specific skills and expertise are relatively low. This situation improves the bargaining position of manufacturers vis-à-vis such service providers by reducing switching costs.

Also, the low investment requirements of service providers increase competition, making it easier for new players to enter the industry. High competition (implying less concentration) between these firms allows manufacturers to occupy a central position in their strategic networks. If manufacturers can switch third-party suppliers at relatively low cost, relationships may become distance ties rather than relationally embedded ties. However, for third-party service providers, the easy and fast processing of returned products due to increased modularization or standardization can provide opportunities to gain advantages by serving multiple manufacturers, which can lead to cost advantages. However, this trend of products becoming easier to disassemble for repair also brings new challenges for manufacturers. Thus, the trend appears to be toward increased standardization in the form of modular device design, collaborative networks with small service providers, and online communities that help large manufacturers achieve green goals.

Conclusions

Studying and understanding the degree of uncertainty that exists for companies that want to move from the linear economy to doing business in the circular economy is important to the success of this transition. The aim of this paper was to develop a theoretical basis for understanding how firms can profit in the circular economy and why firms may not be able to successfully transform their existing business models into competitive circular economy business models.

Effective management and company creativity, along with the ability and commitment to change are important for companies to initiate a new generation of business models. Uncertainties surrounding the circular economy hinder the ability of companies to act with limited contracting costs because they cannot or do not have the competence to formulate sufficiently detailed contracts. When resource investments are made to support circular business models, managers face organizational inertia and internal challenges that must be overcome when building the new types of resources needed. As such, the resources and capabilities needed to compete in the circular economy should be the focus of future research.

Partners in a reverse supply chain must develop unique expertise to provide various end-of-life inspections and repair services. In other words, moving from a linear business model to a circular business model can sometimes require substantial investment from third-party service providers. From an industry perspective, we expect that the modularization of product components and other important trends in industry management will improve the bargaining position of manufacturers' vis-à-vis service providers by reducing switching costs.

Customer responsibility increases when companies develop circular business models. Customers can misbehave by damaging or mishandling products when companies offer long-term contracts to ensure the highest possible standards of sustainability.

According to the transaction cost theory, the failure of companies to enter the circular economy and compete with such business models would be represented by the lack of success in minimizing the sum of production and transaction costs. Indeed, perhaps the reasons for this failure are high asset specificity, uncertainty and perhaps even the risk of opportunism on the part of regulatory bodies and larger market players setting environmental policy. As such, we believe that further efforts by specialists are needed to provide theoretical explanations of the real bottlenecks for the circular economy and why companies are late to compete and from a sustainability point of view.

In general, it is clear from the theoretical background that firms entering the circular economy with innovative business models to address sustainability concerns face a highly uncertain environment. In this environment customers and their behaviors are sometimes unknown or undefined, and product attribute needs are uncertain. Furthermore, there is no clear or established value chain and no value delivery mechanism based on what has been widely researched and propagated within the traditional make-use-dispose business model.

When a company moves to a circular business model, reverse logistics networks must be established. There are often substantial advantages for a manufacturing firm to outsource activities related to reverse logistics operations. Such operations may lead to alliances with collaborators who have developed the expertise, sophisticated logistics networks, technology and capabilities to operate logistics systems efficiently. Manufacturers do not need to develop expertise in these areas. Instead, they can rely on specialized experts and enjoy the advantage of having contractual relationships with several manufacturers. This outsourcing contributes to the development of networks in which dependencies are built between companies in terms of the resources and capabilities they possess. Mutual dependence and relationship-specific investments by network companies encourage trust, reciprocity, and information sharing.

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