Financing of Circular Business Models - Proposed future research agenda

Ann-Charlotte Mellquist[i,*], Emanuela Vanacore[i], Susanne Olofsson[ii]

[i]RISE AB; [ii]Susanne Olofsson AB

*ann-charlotte.mellquist@ri.se

Introduction

The circular economy (CE) is a concept that has attained a growing interest in the last decade. The CE has not been clearly defined, but we take the view that a CE is a vision of and a framework for rewiring our current linear take-make-dispose economy into a radically more resource productive economy. CE is suggested as one of the major strategies to respond to the substantial environmental and sustainability challenges of our time (Stahel, 2010; EMF, 2012). Circular Business Models (CBMs) in general, and Product as a Service (PaaS) models in particular, have been put forward as one of the enablers for the transition from a linear to a CE. This is because they shift the incentives of the manufacturing firm from profitability through a resource depleting “flow” of products to an “asset” logic, where profitability is aligned with resource conservation or even regeneration. (Stahel, 2010; Tukker, 2015; Bocken et al., 2018; Hopkinson et al., 2018). In a PaaS model, products are not sold and withdrawn from stocks. Instead, they remain as an asset in the balance sheet and direct revenues from product sales are replaced by lower rental revenues spread over a longer time period, thus affecting the cash flow of the company. These shifts will affect the need for financing and capital in the short and long term for the product company.

While the CE, CBMs and PaaS have become important research topics, they are still rooted to a great extent in the sustainability field and in the resource perspective. The particular aspects of financing of these models and of how the financial sector is affected and could align with these emerging business changes have not been very well researched. Our hypothesis is that the shift to CBMs must align with a corresponding shift in the financial sector. It is therefore vital that also the financial aspects of the shift catalyse more attention from research and this abstract proposes such a research agenda. The study is based on the combined results from a literature review and a Swedish research project.

Background

Literature review

The financial system is likely to be a key enabler to transition to a CE. Organisations require a different access to financing and risk management tools to support change-in-ownership models, capital investment, funding R&D and new technologies (EMF 2012, 2013 and 2014). Financial institutions have the potential to facilitate such a transition in many ways (ING 2015; EIB, 2015; FinanCE, 2016; ABN AMRO 2018; IEMA 2018) however, clear evidence of specific mechanisms is scarce both in literature and practice.

The study aimed to detect and assess the breadth and depth of academic research on financing CBMs. In order to do so, Scopus, one of the largest abstract and citation databases of peer-reviewed literature in all scientific and technical disciplines was utilised. Some keywords relevant to the research topics were selected and inputted in the search boxes (i.e. “circular business models” AND “financing”; “circular economy” AND “financing”; “servitization” AND “financing”; “product-as-a-service” AND “financing”; “PSS” AND “financing”; “circular business models” AND “financial system”;“circular economy” AND “financial system”).

For example, a search inputting the keywords "circular business models" in combination with "financing" with no restriction gives eight results, whereas zero when the restriction to "in the text" is applied. From the first search, these are the main results:

Aranda-Usón, Portillo-Tarragona, Marín-Vinuesa & Scarpellini (2019) argue that availability of funds, quality of the firm's own financial resources and public subsidies have a positive effect in stimulating the implementation of CE initiatives in businesses. Pavoni (2019) describes how the International Finance Corporation (IFC), the private sector arm of the World Bank, is drawing its attention on numerous circular initiatives. The article highlights that financial institutions are still very hesitant in financially supporting circular companies due to too many uncertainties. Oncioiu et al. (2018) outline how Romanian SMEs strive to contribute to the development of a sustainable economy. The study shows that of the nearly 241 businesses that have developed CE activities over the past five years, only 13% of SMEs used bank loans, while nearly 11% benefitted from government grants. About 10% used various non-reimbursable funds from the EU, the EBRD, and the IMF, or had access to alternative sources of funding. The paper provides an interesting descriptive contribution of the typologies of financing sources for SMEs however, without any detail on dynamics and problematics. Ploeger et al. (2019) reflect upon applying circular principles in the building industry. The authors argue that circular practices based on the concept of service providing in terms of operational lease necessitate a radical change from the traditional ownership model. It is expected that the related property law rules and financial mechanisms will hardly change in the coming years. Despite the valuable points, the article is purely based on a literature review and is limited to the Dutch property system.
Other relevant information for our research questions can be retrieved from Rizos et al. (2016). The study, based on literature review and company surveys, show that lack of funding is a key obstacle for SMEs to switch to CBMs. The study also confirms that the banking sector struggles to understand and correctly assess risks and potential of the new business models.

From the literature review it seems that the few studies on financing CE vaguely focus on the businesses, but with no in-depth analysis of obstacles or opportunities for businesses, nor any analysis on the financial institutions to be found. However, it is interesting noting that several institutions (including financial ones) have published documents in the form of guidelines on circular financing for enterprises, e.g. ING (2015), ABN AMRO (2018), IEMA (2018), EIB (2015). The documents all stress the importance of considering sustainability in business while guiding through the current landscape on sustainable finance. Also, CE is seen as a means to achieve environmental and societal sustainability as well as an opportunity for pursuing financial and economic goals. In other words, there is money to be made for both enterprises and financial institutions.

Method

The aim of the research project was to explore the question of financing of CBMs from two perspectives, that of the product company wanting to shift to PaaS, and that of the financial sector. The method applied was a multiple case study, comprising qualitative data from secondary and primary sources. The collected secondary sources included documentation from publicly available financial reports. The primary sources were collected during interviews in person and over the telephone, exchange of emails and workshops with two types of key players, i.e. product companies and financial actors. Both companies partnering in the project and companies outside the project team were interviewed. The research team undertook continuous analysis meetings to discuss and synthesise the results.

Twelve product companies were interviewed. They represent product manufacturing and selling firms of different sizes, in a wide spread of industries and with various products and service offers. All of the product companies either operate or have plans (more or less developed) of expanding PaaS models and all of them were based in Sweden, see table 1.

Table 1. Key facts Product companies (year 2017)

Name	Type of product/service	Turnover (MSEK)	No of empl	Solvency (%)
Modul-System	Interiors for service vans	231	89	54
Kinnarps	Office furniture	4137	2279	51
Clean Motion	Small light electric taxi vehicles	5	9	44
Houdini Sportswear	Functional clothing for an active life	137	42	9
2p1	Lighting and fittings	1	4	21
Toyota Material Handling	Forklifts	1523	442	69
ABB	Electric, infra, industry and transport products	33030	8027	40
Selecta	Coffee and vending machines	950	405	21
RP	Reused furniture	45	30	50
Hr Björkman	Entrance mats	33	27	45
Taiga	Special purpose work clothing	79	20	49
Hako	Gardening and cleaning machines	449	129	64

Twelve financial actors were interviewed. They included both smaller niche banks, larger merchant banks, leasing companies and publicly funded financiers. Three of the financial actors were based in the Netherlands, one in the UK and the remainder were based in Sweden. For some key facts, see table 2.

Table 2. Key facts Financial actors (year 2017)

Name	Type of business	Type of financing	Income (MSEK)	No of empl
Sparbanken Sjuhärad	Regional savings bank	Loans	577	166
Ekobanken	Niche membership bank	Member loans	20	15
JAK bank	Niche membership bank	Member loans	35	18
Danske Bank Sverige	Merchant bank	Loans	**)	1500
Volvo Finans Bank	Leasing company	Object financing	52688	196
Swedbank Finans	Leasing actor, part of Swedbank AB	Object financing	**)	**)
Almi Företagspartner	Publicly owned SME financier	Loans	1060	500
Almi Invest	EU funded Venture capital company	Shares	***)	***)
Rabobank	Dutch cooperative bank	Loans	120010*)	26383
ABN Amro	Dutch merchant bank	Loans	92900*)	19954
ING Bank	Dutch merchant bank	Loans	178760*)	51504
Circularity Capital	UK Venture capital and circular advisory	Shares	**)	8

*) Converted at 10 SEK/Euro. **) No public data available. ***) Included in the numbers of Almi företagspartner

Findings and recommendations for further research

From our literature study, we claim that financing as a challenge and an opportunity for expanding PaaS models is not a well-researched area. The few examples of academic literature about financing of circular business models that exist do not deep dive into neither the challenges of the transitioning company nor of the financial actors. Some efforts to describe the challenges have been undertaken by the financial industry itself, especially in the Netherlands. However, academic literature remains scarce. Moreover, our project confirms that companies transitioning from product sales to PaaS models, consider financing a real issue for the transformation. Companies with strong owners and subsidiaries of larger groups can cope with internal capital for a longer time, but the project confirms that the financial sector is a key player to enable the transition to and expansion of PaaS models, and thereby to a more CE. It also confirms that this transition is a business opportunity for the financiers. We therefore suggest that extended research is needed in the following five areas:

Asset valuation

Our project validates that shifting to PaaS models affects balance sheet, cash flow and thus the need for finance. What remains less clear are the details of the balance sheet effects, including valuation of assets. Accounting rules and asset valuation standards today are not set up to support long-lived assets, remaining in stock for a long time, maybe decades. According to general accounting definitions, items that are in stock for longer than one year should be considered a non-current or fixed asset (Atrill & McLaney, 2013). The decision on if an asset is long-term or short-term will impact common KPIs, such as Capital Employed, Return on Capital Employed (ROCE) and Inventories turnover period. Another issue is how to assess the residual value of assets remaining in stock over long periods. The difference of terms such as utility value vs financial value become important. We therefore suggest that more research is undertaken to both understand effects on accounting rules and asset valuation standards, as well as case studies of companies who work with different models - and thus different sets of KPIs - in parallel.

Timing of capital sources

Our study showed that there is an understanding from both product companies and financial actors that “sustainable business requires sustainable finance”. When perceived more risky models or ventures need financing, there is also an understanding that the more costly owner financing (i.e. equity) will become more important compared to loan financing, at least in the start-up phase. These findings suggest that there will be a need for a more varied set of capital sources or types of financing, which would depend on where in the expansion phase the company is, the type of business (products and services) involved and collateral available. The dynamics of these shifts, the risks and new opportunities for different financiers have not been well-described and we suggest more in-depth research in this area.

Financial sector - processes, tools and methods

Financiers face new challenges and opportunities when their customers shift to PaaS models. Challenges are related to PaaS developing in new industries: There is a lack of benchmark numbers for comparison of payback times or profitability levels, a lack of second-hand markets for collateral and maybe also a need for new types of collateral, such as contracts. Opportunities include customer relations based on long term stable cash flow and possible new credit products to enable this. We conclude that this shift will affect many parts of banks’ and other financiers’ businesses, as their perspective on risk and credit-worthiness needs to move from retrospective “asset-based” to future-looking “business-based”, and that relevant research knowledge of this shift is still lacking. This includes effects on financing strategy, credit assessment and risk processes as well as the corresponding tools and methods.

Increased sector knowledge, transparency and collaboration

Results from interviews with both product companies and financial actors point at the need for more collaboration between the two sectors. This is also in line with CE literature emphasising the need for more cross-sector collaboration (e.g. EMF, 2012). The lack of usual benchmarks and collateral require not only updated risk and credit assessment processes internally in the bank, but also a new kind of collaboration between bank and customer. Increased sector knowledge, in terms of a more in-depth understanding of the customer's business model, revenue streams and even the customers' customers is needed and this in turn requires more transparency between the actors. New data sets as well as joint values need to be understood, described and aligned. The role of the bank will shift to a more active and strategic partner (rather than just finance provider). We suggest that these joint challenges and processes could be investigated in broad research projects, involving all relevant actors. Many methods are available for multi-stakeholder value alignment. We suggest to use the so-called community canvas (Community Canvas, 2019) to explore a joint value proposition.

The need to integrate core CE theory with finance theory and practice

The CE has been defined in different ways (Kirchherr et al., 2017). The descriptions often refer to materials flowing in different loops, cycles and circles, hence avoiding waste both materially and economically. EMF (2012) talks about "inner loops" and "cascading loops" as an enabling principle for a CE, Bocken et al. (2016) mention "closing, narrowing and slowing loops" and the concept of "zero waste" is broadly mentioned as a key principle (e.g. EMF, 2012; Stahel, 2010; European Commission 2018). Our research adds that sustainable business needs to be matched by sustainable capital. We believe that this should have consequences not only on how the finance sector works and operates at a micro and meso level, but also at the level of the economy as a whole. What do circular principles, such as "slowing loops" and "narrowing loops" imply at a macro level and for (global) financial markets? What do they mean for interest rates, quick payback cycles and ever-increasing profitability and return requirements? Are our current financial systems and theories at a macroeconomic level ready to host the logics of a CE at a micro and meso level? We suggest that there is a need to integrate CE theory into financial theory and practice through new theory development.

Conclusion

In the current era of climate change and increasing pressure on ecosystems, the CE promises to provide a new logic of production and consumption that could replace the current linear system by a circular system that radically reduces mankind's resource footprint while maintaining economic prosperity and business dynamics. The shift to CBMs is an important enabler and especially so the asset-based PaaS models. While research on CBMs is extensive, research on the specific topic on the balance sheet effects and the implication on financing remains scarce. We proposed a research agenda for the topic of financing CBMs, based on a literature review and a research project including both product companies and financial actors. The five recommended research topics are: Asset valuation; Timing of capital sources; Financial sector - processes, tools and methods; Increased sector knowledge, transparency and collaboration; The need to merge CE theory and finance theory and practice.

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