



Financing the Circular Economy: Four Elements of Success

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Abstract

The transition to the circular economy, from start-ups to multinationals, can only be realised if there is enough financing available. However, financial institutions and investors are only likely to finance profitable solutions, measured within time-honoured linear economy thinking. In this qualitative study, we argue that looking at simply the business case is a singular, static view whereas the economy is a complex, adaptive system. Hence, in addition to the business case, we are adding three more elements we consider indispensable for the circular economy transition to initially succeed and thereafter remain sustainable. These are infrastructure, education, and mindset.

1 Introduction

1.1 Background

The transition to the circular economy has now reached all continents and almost all industries. The past linear economic model of extract-produce-consume-waste is apparently being phased out and seemingly soon to be replaced with a circular approach. Consequently, there will be a decoupling of economic growth from the former resource-based model. Or perhaps not? Or, at least, maybe not quite yet.

The implementation of the circular economy is clearly not going to be a sprint but rather a marathon that will require a deep transformation in many companies and, in order to reach this circular transition,

companies will need access to capital. Initial studies reveal numerous challenges, be it due to circular business models (SITRA, 2019), revenue predictions, balance sheet implications or collaborative value chain risks (Goovaerts & Verbeek, 2018).

If the corporate goal is indeed to reach circularity, how can companies be well-equipped for this challenging journey? The access to capital is key but only one element in the system that helps finance production and infrastructure changes. For example, capital without the right know-how within the company's management will not lead to a regenerative, waste-free circular economy. Additionally, from where will the next generation of leaders come that can continue the long journey along on the circular path? Plus, in addition to knowledge about the circular economy, is the current corporate mindset truly open to this transition?

The first author of this paper has concluded from her consulting work in the Middle East and Southeast Asia that, for the circular economy to succeed, four elements are required: firstly, the business case followed by infrastructure and then education and mindset. We cover these four elements in this research, embedded within the overarching concept of systems thinking.

The balance of the paper will cover the literature review and the theory, methodology and the results from expert interviews. Due to a page limitation, we will present only the most relevant literature.

1.2 Literature Review

As one Ellen MacArthur Foundation report indicated, one main barrier towards true circularity is the lack of investment. The circular economy has not yet become a mainstream investment area for the private sector, the report argues, risking the realisation of a full transition and, along with this, the benefits hidden within the circular economy. To mitigate this, €320 billion of investment opportunities are available to investors in the European Union until 2025 (Ellen MacArthur Foundation, 2017).

One of the first publications with a focus on financing the circular economy was provided by the European Investment Bank (EIB), acknowledging that the transition to the circular economy is going to be complex and multifaceted but nonetheless necessary due to its economic and societal benefits (Goovaerts & Verbeek, 2018).

In Toxopeus et al. (2021) business model innovation is at the centre of their research, as new business models routinely bring challenges with them when it comes to financing. Access to financing has never been easy for small and medium-sized companies and young, start-up firms. Moreover, shifts in material use, product longevity, ownership and cash flow returns can further increase barriers to capital for circular companies with their innovative business models. In this paper, the authors offer a "*fine-grained empirical understanding of how different business model components can facilitate access to bank finance*" (Toxopeus, Achterberg, & Polzin, 2021).

The Duddy et al. (2020) paper sheds further light on the impact that private wealth can have when, and or if, banks align their activities with international environmental goals (Duddy, Kwon, & Paetzold, 2020). (Ozili, 2021) argues that some financial institutions are actually being pressured to finance circular projects. However, these institutions will only participate in the circular economy if there is a clear benefit for them to do so.

The benefit of these publications is that they provide a crucial understanding for grasping the challenges within the finance world caused by the circular transition. However, as stated, we believe that focusing only on the business case component of financing is a singular, narrow and static view and thus not appropriate because circular initiatives aim for permanent change to a vast, dynamic system. For this reason, we must also look at the interconnections between infrastructure, education, and mindset as key drivers of behaviour change. That is why our paper sheds light on these other long-term enablers and drivers behind circular transition success.

2 Four Elements of Success in a Circular System

2.1 The Circular System

Kirchherr et al. (2017) examined circular economy definitions in the academic literature and surprisingly discovered 114 of them. Among the 4Rs (Reduce, Reuse, Recycle, Recover) framework, the circular economy is reduced to recycling in 79% of the definitions (Kirchherr, Reike, & Hekkert, 2017). Since 2012, the authors observed an increased emphasis on a systems perspective which we also consider to be a core principle of the circular economy.

As the authors indicate, the transition to the circular economy is not going to be a quick win but a long-term undertaking, like a marathon we mentioned earlier (Kirchherr, Reike, & Hekkert, 2017). And, as with any long-distance run, pre-race preparation is necessary and a feeling for the length of the course or track is paramount. So, what does a company need to do to win a circular economy marathon? It must acknowledge that companies are vibrant, constantly evolving systems connecting diverse stakeholders. As (Meadows, 2008) states, “*system structure is the source of system behaviour*”. In our prevailing system of behaviour, all resources are taken from the Earth but once turned into products, lose their value at the end of their lifecycle because we value only their functionality, not the initial effort that went into getting the resources and turning them into products.

Hence, to change the system, the system structure that underpins system behaviour needs to be questioned. In our opinion, this change needs to include not only the business case and the infrastructure of global supply chains but also to question if our current educational curriculum does support the transition. Our predominant current mindset, which has been naturally influenced by education, has sanctioned the view that discarded products are waste. However, they could be seen a new source for needed materials. After all, they were at one point taken out of earth and are therefore still valuable.

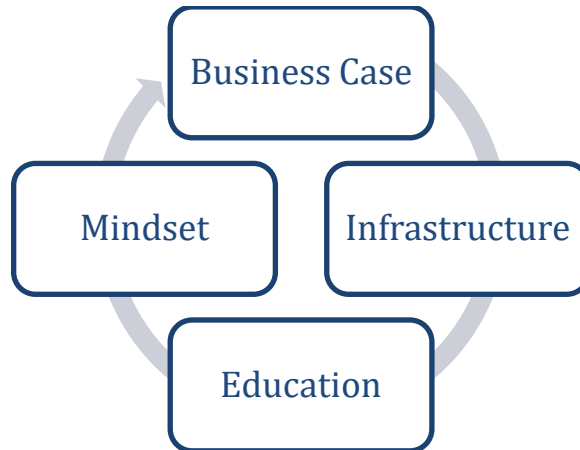


Figure 1: Four Elements for the Success of the Circular Economy

2.2 The Business Case

At the very centre of the transition to the circular economy are novel business models. Consequently, these models might have risk elements that the current risk models of banks might not include because these currently used risk detection tools are not programmed to identify them (Ozili, 2021).

Toxopeus et al. (2021) provide three strategies that can help companies lower the barriers to capital. However, the authors argue that policy makers can also provide support by implementing regulations that stimulate the re-use of materials. Plus, a circular transition will automatically make business sense if the relevant commodity price increases to such an extent that “... *the total investment cost of going circular is lower than the overall price of the resource saved over a certain defined time*” (Toxopeus, Achterberg, & Polzin, 2021).

(Ozili, 2021) and (Yalçın & Foxon, 2021) follow a similar argument, stating that the circular economy might not survive without government support. Banks and financial institutions report to their shareholders and thus they will likely only finance circular solutions that are profitable. Despite this, as more investment companies (Hedge Funds and Private Equity) deploy capital to the circular economy, profitability prospects in the circular economy will widen (Ozili, 2021). However, the majority of producing companies have built their international supply chains as a one-way street and change will require significant investment into their infrastructures. Who will finance these changes?

2.3 Infrastructure

Within the 4Rs mentioned earlier, the fourth R stands for “recover”. However, within a global value chain, this undertaking will pose challenges. A company that decides to get its products back, be it with Extended Producer Responsibility (EPR) or within the business model Product-as-a-Service, might not have the capacity to dismantle products to extract materials for reuse. They might have to look for a partner company that has corresponding capabilities for creating a circular value network (Toxopeus, Achterberg, & Polzin, 2021).

As mentioned with risk predictions, from a bank’s perspective, this is another uncertain variable added to the equation. “*Once a business enters into a collaborative model, the borrower’s creditworthiness will be strongly correlated with the solidity and reliability of the value chain*” (Dewick, Bengtsson, Cohen, Sarkis, & Schröder, 2020). In certain cases, the cost to recover waste might exceed the market value of recycled waste products (Ozili, 2021). Hence, these secondary markets with valuable, used assets need yet to be developed (Goovaerts & Verbeek, 2018).

On the other side, if a company cannot bring its products back or work with a reliable partner due to lack of financing, it will not be able to enjoy one of the chief benefits of the circular economy. Plus, the lack of required infrastructure can lead to a rejection of funding from a financial institution.

2.4 Education

The authors are educators who have worked within business schools and universities for over two decades, so we are aware that the circular economy and the approach to waste have been neglected at best, and ignored at worst, in business education. “*Lack of knowledge and technical skills around the circular design of products and services impede practical applications*” (Yalçın & Foxon, 2021).

Educating enough leaders who can lead the way down the path to circular transition is a prevailing challenge. However, as dynamic systems, companies are going to need future business leaders, engineers, designers, etc. Recognising this, Finland, for example, has made headlines with the announcement that the circular economy will be taught as early as elementary school (SITRA, 2019).

Plus, in regard to training, the European Union’s Right to Repair initiatives begs the question if the European Union will have enough specialists to repair these products. Countries like Germany are already facing worker skill shortages, especially in the *Mittelstand* (Burstedde & Schüler, 2020). Attracting young talents into manual jobs that are less glamorous than IT careers might prove challenging.

Additionally, current decision makers in banks and financial institutions were educated in the linear model of business. Moreover, challenging and then changing existing company culture and beliefs are

barriers to change and this will not be easy to accomplish but will be ultimately necessary (Yalçın & Foxon, 2021).

2.5 Mindset

The fourth element is mindset, the central factor influencing the other elements. Senge (1990) calls it a metanoia or a shift of mind. It relates to a deep learning that allows us to “...reperceive the world and our relationship to it”, extending our capacity to create (Senge, 1990). It requires a bigger mental shift than simply applying the old models to future challenges. As an example, (Goovaerts & Verbeek, 2018) argue that a circular business might be considered riskier, especially if it is a small or a medium-sized company with a shorter track record, limited access to financial resources and in a volatile financial position. Clearly the out-dated linear models will require an adjustment towards a new mindset with a deeper and more open understanding of all the possible challenges and opportunities of the circular economy.

On the consumer side, the prevalent attitude of owning products outright versus only leasing them for a period of time is another significant mindset challenge. For example, in many countries, for example China, owning a new product is seen as a sign one can afford it and thus one achieves an elevated status. Owning a used product is frowned upon and this will require a mindset shift that will require consumers to feel that there is prestige to be gained by oneself—and others—seeing formerly discarded products not as garbage but as a practical, prudent sourcing of raw materials.

The interviews we conducted across the investment community have shed some significant light on these four elements and reinforced that we are indeed only in the early kilometres of a long marathon.

3 Methodology

We observed an inflated number of self-proclaimed commitments to the circular economy from the corporate side, which reminded us of the “*green-washing*” that actually tarnished legitimate sustainability initiatives a few years back. This prompted us to shed more light on what is necessary for the circular economy to be successful in the long run. We chose a qualitative approach in this research project.

3.1 Data Sampling

We selected interview partners to ensure academic rigour, as well as, to gain practical insights from divergent parts of the world. The data was collected via semi-structured interviews to gain in-depth understanding on these four fundamental elements. There is no empirical work in the literature describing the interconnections of these four elements nor sufficient data available to quantify the relationships. Therefore, qualitative research is the best approach to generate novel insights into the relationships that are difficult to quantify (Goovaerts & Verbeek, 2018). The sample was chosen using a purposive sampling method which consisted of experts in the financial sector with a previous track record in sustainable financing, at within or linked to, the financial centres of London, Zurich, Singapore, Hong Kong and Frankfurt am Main, Germany.

3.2 Data Collection

Our interviews were conducted in English and German (translated into English) with nine experts or practitioners during the second half of 2021. All interviews were on Zoom and lasted between 28 and 63 minutes. These experts came from the UK (1), the Netherlands (1), China (1), Switzerland (2), Singapore (1) and Germany (3). They work for large banks or financial institutions. The first part of the

interview covered general information about the practitioners themselves and their position within the company. Then, the four elements for the success of the circular economy were discussed. The details of position, country and the length of interview are shown in Table 1.

Practitioner	Position	Country	Recording Time
P1	CSO	The Netherlands	50 min.
P2	Regional Head	Singapore	48 min.
P3	Equity Financing	Germany	37 min.
P4	Head of ESG Department	Germany	35 min.
P5	Board Director and Chief Sustain. Officer	The UK	71 min.
P6	Corporate Cash Management	Germany	28 min.
P7	Investment Analyst	Switzerland	57 min.
P8	Founder and CEO	Switzerland	35 min.
P9	Executive Vice Chair and Secretary General	China	63 min.

Table 1: List of Practitioners

3.3 Data Analysis

According to (Gioia, Corley, & Hamilton, 2012) recommendations, we initiated our analysis based on inductive category development for qualitative data analysis. In the first step, we formulated our initial research question, developed the questionnaire, and scheduled the Zoom meetings. The questionnaire contained five parts and thirty-two questions in total. Afterwards, our interviews were transcribed verbatim by a third member of our research team who had not attended any of the meetings. We worked manually through the material and analysed, step-by-step, different categories and codes from the transcripts. The results are presented assigned to respective elements.

4 Findings: Four Elements of Success

4.1 Overall Findings

As mentioned earlier, the diversity of definitions reveals that the circular economy has different meanings to people. This was also confirmed by our practitioners as the definitions from them varied as well.

When asked an opening question about their familiarity with Systems Thinking, only three experts have already embraced it, while two were “*slightly familiar with the concept*”.

The question about applying systems thinking delivered interesting results:

“Have already started implementing it within the company. We need to think of long-term solutions.”

“Critical to the economic model of the future. We have to be able to connect the dots and understand the whole value chain and its impact on society and the environment.”

“Important to look at the company as a whole. One challenge with systems thinking is that everyone has a different definition of what they consider a system. Need to define a system first, then find out how to coordinate with everyone in that system using financial rational rather than benevolence.”

“Use systems thinking to consider future scenarios that may impact future cash flow and make it more resilient. We need to think of the future in a much more nuanced way rather than having it as an extension of the present.”

Next, we will specifically examine the views and responses expressed regarding our four elements, starting with the business case as the most important one.

4.2 Business Case

The most important step towards achieving a sustainable transition to circular economy is clearly a sound business case, be it as a new business idea in its infancy or a transition within a multinational organisation. The new product or service has to generate profits. The Practitioners' replies revealed a consensus on this element albeit a cross-section of challenges identified.

When asked about considering an investment in a circular economy company, almost all investors' answers were positive. This was no surprise as they had previously indicated they were familiar with the concept and were willing to talk about.

"Our company is trying to incorporate elements of the circular economy into the heart of the company, but it is hard to use it as an exclusive parameter for making decisions."

"Yes, we already invest in companies with big chunks of our revenues tied into transforming to a circular economy. As long as a circular company has an interesting portfolio and meets our normal criteria we would."

"Our company has examples of circular companies we have lent to and invested in them."

"Yes, but the company would need to fulfil all criteria just like any other company. However, it is understandable that forecast may be different for these companies and are harder to predict and this would affect their business case."

"The company has to provide sustainable economic return to be viable."

Predicting future cash flows turned out to be a particular challenging issue for circular companies. P1, who was among the experts involved with the circular economy for Dutch banks, stated that:

"It is hard to predict future flows with circular companies."

Other experts pointed out that:

"...forecast might be different for these companies and hard to predict."

"Very difficult with start-ups. You have to rely on trust."

In the next section, the practitioners' answers to questions concerning infrastructure are covered.

4.3 Infrastructure

Our findings about infrastructure were diverse, with this practitioner suggesting what his company and others should do. He pointed out the issue about the long-term financial sustainability a company.

"Need investors to commit to long periods (10-15 years) and redirect investments from old to new infrastructure, however this has difficulties. Investors are hesitant to commit new asset flows as it is difficult to know how stable the returns will be. Investors have a duty to accept that there may be less immediate profits if it safeguards or improves future profits."

Another investor also criticised the short-term thinking of markets and added:

"More data will allow the industry to understand and integrate it into their data models and frameworks."

However, there are some potential challenges, as P4 from Germany expressed.

"Previous infrastructure can be harmful. Waste collection in some companies is so highly regulated that it prevents innovation. Corruption is also an issue in infrastructure in some countries."

The response from P9 was no surprise, as China has invested billions into infrastructure such as building roads, airports, trains, and train lines, thus connecting its major industrial hubs with each other.

“If you want to change the future, you must first build your infrastructure.”

An understanding that one company cannot create a whole new ecosystem alone was expressed with this statement.

“Realise that a company cannot manage it on its own and that collaboration will need to happen.”

When asked about the role of the government in regard to infrastructure, only one investor put the responsibility with the company. Other offered a variety of suggestions, including a blended-finance model.

“Put money into non-proven technologies or ways of thinking, stimulate and encourage collaboration between the top companies and supply incentives to investors and then support this with market incentives.”

“Initial seed money would help in a broad sense. As it is such a big topic, government money might just be a drop in the ocean for what is needed.”

“Clear direction of travel from governments. There is a need to understand the ways in which business impacts the environment and how they depend on it.”

On the issue of incentives to foster collaboration between government, public and private streams, EPR was mentioned with only three investors making a clear statement. One of these said:

“Logical to have some extended-polluter-pays approach.”

One investor even mentioned the role of taxes in order to control pollution. Overall, there was an understanding that companies ought to take some corporate responsibility for their products.

However, as the conversations showed, considerable education is needed until there will be a better understanding about the overall business ecosystem and its impact on humans and the environment.

4.4 Education

So, turning to education, we stated earlier that companies can only succeed in their transition to the circular economy if their management and employees know what the circular economy is. Thus, the question about what needs to change in education today in order to foster a new generation of leaders tomorrow brought many answers concerning leadership training. Notably, P8 stated that we need to:

“...get rid of the old paradigm that the environment is free and apply a holistic approach across different sections.”

Regarding a current number of graduates on the job market who can help companies tackle the challenges, four investors pointed out that the new generation has a better understanding of the world we live in than the older generation, as there is an understanding that it is their future. However, one investor stated that,

“Very often youthful idealism gets knocked out of them once they join the workforce.”

With respect to education, P9 expressed his view on the role of government:

“... should facilitate to prepare to educate the next generation and guide the public as they are trusted. Knowledge and education are everything and can be used to change the fate.”

When asked how early children should be introduced to the circular economy, seven investors emphasised the importance of an early introduction, as is practiced in Finland. One stated, an early exposure can:

“...help people make sense of the complex, dynamic world we live in, helping them to connect the dots (systems thinking).”

Moreover, P8 argued that:

“It is important to teach children young and give them the right direction as it gets harder when they get older.”

Education, when at its best, leads to metanoia [14] that we mentioned earlier and to the fourth and final element for circular success, namely mindset.

4.5 Mindset

Regarding the questions on the role of mindset, some investors pointed out the need of more open-mindedness and a questioning of our habits. The issue of long-term thinking was raised again, this time from one Practitioner from Germany who criticised so called Sustainability Weeks:

“Dedicating a week to sustainability and believing that problems can be solved in one week does not work because after the week is over people carry on as before.”

“My company did an interesting work on what we need to do to reach carbon zero and a change in mindset was the biggest factor. How we see things is a critical way of how we understand things and the way we understand things changes how we act.”

“This thinking has not yet been anchored in companies and it is hard to change the mindset of those who do not believe in it.”

“People haven’t yet seen the direct cost of being linear.”

As business education has neglected environmental studies for such a long time, one practitioner stated that it will be difficult to change the “neo-liberal” way of thinking. Investment decisions in favour or against financing a circular company are made with old knowledge, as well as, with a decades-old mindset that has guided investment decisions in the past.

When it comes to changing mindsets, P8 referenced that he started with sustainability financing twenty-five years ago and only now, a generation later, are things picking up.

5 Conclusion

Our study contributes to the understanding of what is required for the circular economy to succeed in the long run. The magnitude of change inherent within this circular transition will undoubtedly require substantial financing. This is why we choose investors as our interview partners. Our semi-structured interviews with nine practitioners from different financial centres around the world set out to focus on and gather more research on the four elements of success, namely the business case, infrastructure, education, and mindset.

Regarding the business case, it came as no surprise that our practitioners collectively agreed that banks and other financial institutions will only invest into companies that assure profits. These profits might depend on companies getting access to secondary markets or creating a new system with extended lifecycles and steady revenue streams, which also requires additional financing.

However, their opinions regarding infrastructure and the related role of government, somewhat diverged. Hence, regarding financing of the infrastructure, this study cannot give a clear answer. With regards to the third element, education, there was again more consensus that graduates with circular knowledge are needed and that schools should play a key—and early—role in teaching the circular economy. The fourth element for success—mindset—also revealed a commonly shared view and consensus that more long-term thinking is necessary.

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