
Munich Personal RePEc Archive

Circular economy, banks and other financial institutions: what's in it for them?

Ozili, Peterson K

2021

Online at https://mpra.ub.uni-muenchen.de/107397/
MPRA Paper No. 107397, posted 30 Apr 2021 16:38 UTC

Circular economy, banks and other financial institutions: what's in it for them?

Peterson K. Ozili

Abstract

The circular economy agenda is widely seen as a response to climate change and is forcing societies to re-evaluate how resources are used towards creating a sustainable economy that is free of waste. Financial institutions are being pressured to finance circular projects and investment. But for financial institutions to participate in the circular economy, there must be a clear benefit to financial institutions. In this paper, I highlight the benefit of the circular economy to banks and other financial institutions. The paper uses discourse analysis methodology to present an overview of the circular economy concept and the benefit of the circular economy to banks and other financial institutions. The findings show that some benefit of the circular economy to banks include: (i) greater loan diversification opportunities, (ii) promotes responsible and sustainable banking, (iii) increased lending to circular clients and the recycling sector which means more profit for banks, and (iv) correcting the bad perception about banks in society. Some benefit of the circular economy to other financial institutions include: (i) issuance of special insurance policies for reused products; (ii) greater sustainability-adjusted return on investment; (iii) greater funding to microfinance institutions; and (iv) more opportunities for collaborative funding to circular businesses. This study contributes to the scant literature that examine the role of the finance industry in the circular economy.

JEL Code: G21, G28, O44, Q54, Q28

Keywords: circular economy, linear economy, banks, financial institutions, criticism, sustainability, climate change, waste, insurance, sustainable finance, sustainable banking, hedge funds, microfinance institutions

1. Introduction

In recent years, the circular economy concept has become popular in academic, nongovernmental and policy circles. The evidence for this is the increased partnerships between ecological institutes and governments, and between policy makers and university faculty, with particular focus on research, innovation and exchange of knowledge (Velenturf et al, 2018; Bolger and Doyon, 2019; Bao et al, 2019). There have been global calls to find new ways to use existing natural resources and materials more efficiently. One approach is to establish and adopt an alternative model that create shared economic, social and ecological value. A concept popularly used to describe this approach is the circular economy model. A circular economy promotes the reuse of waste materials as opposed to the disposal of used material waste which is more commonly associated with the linear economy (Kirchherr et al, 2017; Ozili and Opene, 2021).

In the literature, Ellen MacArthur Foundation (2013), hereafter EMF, show that the circular economy is a right step towards minimizing material waste, reducing environmental degradation, and mitigating climate change. Hartley et al (2020) suggest some policies for a better circular economy, mainly, a policy-induced expansion of circular procurement, tax relief for circular products, liberalization of waste trading, and awareness campaigns. Dewick et al (2020) calls for effective supervision of the circular economy to prevent the circular economy from becoming another compromised and ineffective sustainability concept. They warn that such supervision and oversight should be in place before major industry actors begin to implement international investment standards and launch innovative financing instruments. In terms of measuring the circular economy, Kristensen and Mosgaard (2020) show that there is no commonly accepted way of measuring the circular economy both at the micro and macro level, and that majority of the indicators used to measure the circular economy focus on the economic aspects and pays less attention to the environmental and social aspects of the circular economy.

In contrast to the literature, I examine a different issue in this paper which is the benefit of the circular economy to financial institutions. I argue that, while it is important to require financial institutions to fund the circular economy, it is also important to understand what financial institutions stand to gain by actively participating in the circular economy.

Promoters of the circular economy want financial institutions to fund activities in the circular economy, as a way to show their support and commitment towards achieving the United Nation's sustainable development goals (EMF, 2013). It is also important to understand that financial institutions are profit seeking entities working to make profit for shareholders. They make investment and lending decisions based on rigorous cost-benefit and risk analyses (Ivashina and Scharfstein, 2010). Financial institutions will invest in any sector of the economy, including the circular economy, if there are profitable prospects in that sector of the economy. This then leads

to the question: what's in it for them? What will financial institutions gain by investing or lending to companies in the circular economy? This is the focus of this paper.

This paper contributes to the literature in the following way. Firstly, this study contributes to the circular economy literature (see Korhonen et al, 2018; Kirchherr et al, 2017; Stahel, 2016; Geissdoerfer et al., 2017). It contributes to this literature by identifying how banks and other financial institutions can promote activities in the circular economy. Secondly, this study contributes to the literature that examines the role of financial institutions in promoting a sustainable environment and economic development (e.g. Mezher et al, 2002; Peeters, 2005; Weber, 2014; Lo and Yu, 2015; Ozili, 2020a). The present study contributes to this literature by exploring the opportunities and benefits of the circular economy for banks and other financial institutions.

The rest of the paper is structured as follows. Section 2 presents the research methodology. Section 3 presents the conceptual framework. Section 4 highlights the benefits of the circular economy for banks and other financial institutions. Section 5 concludes.

2. Methodology

The methodology used in the paper is the discourse analysis methodology. Discourse analysis is a research method for studying written or spoken language in relation to its social context. Firstly, I consolidate some ideas from previous studies in the literature and identify a clear-cut definition of the circular economy, its relevance and superiority over the linear economy. Also, using critical discourse analysis, I identify some criticism of the circular economy. Thereafter, I highlight some benefit of the circular economy for banks and other financial institutions.

3. Conceptual framework

3.1. Defining the circular and linear economy

A linear economy is an economic system that promotes the use of raw materials for production and consumption, and the resulting waste is thrown away, disposed of or destroyed (Lag-Brotons et al, 2020). A linear economy can alternatively be described as a take-make-dispose economic system (Goyal et al, 2018).

In simple words, the circular economy is an economic system that eliminate waste and promotes the continual use of resources (Ghisellini et al, 2016; Sauvé et al, 2016). It is an economic system that promotes efficiency through eliminating waste and the continuous use of resources (Singh

and Ordoñez, 2016). The main idea of a circular economy is to close the entire loop in the production cycle and maximise the recycling and re-use of material throughout its lifecycle.

In the literature, Stahel (2016) defines the circular economy as a system where goods that are at the end of their service life are turned into resources for others, and by so doing, closes the loop in the industrial ecosystem and minimize waste. Morseletto (2020, p.1) defines the circular economy as 'an economic model aimed at the efficient use of resources through waste minimisation, long-term value retention, reduction of primary resources, and closed loops of products, product parts, and materials within the boundaries of environmental protection and socioeconomic benefits. Korhonen et al (2018) state that the circular economy is one that emphasizes product, component and material reuse, remanufacturing, refurbishment, repair, cascading and upgrading as well as waste-derived energy utilization throughout the product value chain.

3.2. Circular versus linear economy model: definition and value creation

The linear economy model describes a set of business processes and activities that collect raw materials, transform them into products that are consumed or used until they are finally discarded as waste, and the waste are disposed (Lag-Brotons et al, 2020; Goyal et al, 2018). Under the linear model, value is created by producing and selling as many products as possible.

The circular economy model describes a set of business processes and activities that collect raw materials, transform them into products that are consumed or used. The used waste is then recycled for reuse as raw materials which are fed back into the supply chain (Blomsma and Tennant, 2020; Ozili and Opene, 2021). Under the circular economy model, value is created by preserving waste materials which can be used for alternative purposes. In other words, value is created by focusing on resources preservation (Blomsma and Tennant, 2020).

Table 1 presents a table showing the differences between the linear economy and the circular economy.

Table 1: Comparing the linear economy and circular economy			
		Linear economy	Circular economy
1	Purpose	Generates waste after production and consumption	Prevents waste through sharing, reuse, repair and recycling
2	Model	Take – Make – Dispose model	(i) designing out waste and pollution; (ii) keep products and materials in use; (iii) regenerate natural systems.
3	Business process	(i) from production to consumption, (ii) from consumption to waste; (iii) from waste to the destruction of waste material	(i) from production to waste, (ii) waste is then recycled as raw material for reuse
4	Innovating with waste	Waste is disposed and serves no other purpose	Waste materials are either shared, re-used or recycled as raw materials for other uses in innovative ways
5	Impact on the environment	It damages the environment	It protects the environment
6	Effect on employment	New unique jobs are not created for members of society. Only the same jobs are created	New and unique jobs are created for members of society as a result of waste recycling. It can lead to the creation of a new industry such as a recycling industry
7	Amount of energy used	Uses more resources and energy to produce new goods.	Uses less resources and energy to produce new goods.
8	Drivers	The industrial revolution of the 1800s	The United Nation's sustainable development goals and the Paris Agreement
9	Global reach	The linear economy is the most widely adopted economic model in many countries of the world	The circular economy is the least widely adopted economic model in the world.

3.3. Why the circular economy model is preferred to the linear economy model

Firstly, the linear economy model promotes a take-make-dispose approach to economic growth (EMF, 2013). The linear economy model or the 'take-make-dispose' model associates economic growth with production and consumption of resources and stops there. In contrast, the circular economy model decouples economic growth from the consumption of raw materials (EMF, 2013).

Secondly, under the linear economy model, economic growth is achieved through consumption and disposal of raw materials without opportunities for reuse of materials through recycling or re-production (Lin, 2020). In contrast, the circular economy model provides opportunities for the continual reuse of material (Ozili and Opene, 2021).

Thirdly, under the circular economy model, product reuse, remanufacturing and refurbishment demand less resources and energy to produce new goods (Del Borghi et al, 2020). In contrast, the linear economy model requires the use of more resources to produce new goods (Korhonen et al., 2018).

Finally, the linear make-take-dispose model of today's economic system is unsustainable (Frosch and Gallopoulos, 1989), and may have negative consequences for future generations.

3.4. Criticism of the circular economy

#1. Not all waste is recyclable.

Critics argue that the idea of designing out waste is flawed because not all waste can be recycled. For this reason, a circular economy is not 100% achievable when all waste cannot be recycled (Wang et al, 2018). For example, in the manufacturing sector, manufactured goods can be used to achieve circular economy goals because most manufactured materials can be used longer and reused before they are dismantled and remanufactured. However, in other sectors this is difficult because some materials have limited number of cycles for which they can be recycled. For example, in paper recycling, paper waste can only be recycled once. Another example is the case of specific hazardous waste which cannot be recycled but must be removed completely from the cycle (Asokan et al, 2010).

#2. The cost of waste recovery may exceed the cost of recycled waste products

In some situation, the cost incurred to recover waste might be higher than the market value of the recycled waste products. When this happens, it becomes counterproductive to achieve a 100% recycling rate.

#3. The circular economy agenda views the world through an engineering lens.

Mitschke-Collande and Narberhaus (2019) argue that the main problem with the circular economy model is that it views the world through a purely engineering lens while ironically ignoring the economic part of the system. They argue that the circular economy promotes the illusion that it can tackle all ecological problems through an engineering approach - and this is exactly the problem.

#4. The circular economy will lead to a reduction in the production of new resources and a reduction in the consumption of new goods.

A circular economy will promote the use of reclaimed materials instead of new resources (Esposito et al, 2017). A circular economy will discourage the production of new resources and the consumption of new goods because the recycled alternatives will be cheaper than new goods or resources. This will affect a country's gross document product (GDP) because a significant part of GDP is measured using the total value of new goods produced in the economy. This may lead to a change in the measurement of GDP.

#5. The circular economy may not survive without government support

There is the argument that the circular economy cannot survive without government support. The circular economy needs government support to implement market-enabling legislative frameworks to support the funding of circular projects towards climate change risk reduction (Bolger and Doyon, 2019; Shen et al, 2020).

#6. Government intervention may hurt linear businesses whose waste are biodegradable

Government-led circular economic growth can give rise to inefficiency in pricing and competition. Government intervention in the circular economy, by implementing circular policies and laws, can negatively affect linear businesses that produce non-harmful biodegradable waste. Such policies and laws, usually targeted against linear companies that generate non-biodegradable waste, can negatively affect linear businesses whose waste are biodegradable and harmless to the environment.

#7. Hidden risks and low return on investment

Many circular economy business models have risk elements that are difficult to assess. These risks become hidden when traditional risk detection tools are unable to identified them. Also, many circular economy business models generate low return on investment in the short-term.

3.5. Arguments against financial institutions supporting the circular economy

There are arguments that financial institutions should not support the circular economy until several obstacles to an effective circular economy have been removed.

#1. Because government regulation create waste

The policies, laws and regulations of government can unintentionally encourage wasteful behavior among consumers in some sectors of the economy (Stanislaus, 2018). This is common in the food and beverage sector. For example, the requirement to have expiration date labels on food and beverage has the unintended consequence of making consumers dispose foods and beverages nearing the expiration date even though the food and beverage are still edible to eat beyond the expiration date, only that they may no longer meet the manufacturer's quality standard after the expiration date. This is one example out of many of how government regulation creates waste. The tendency for government laws, regulations and policies to create waste and encourage wasteful behavior is comparable to the linear economy which financial institutions already support with loans. Financial institutions will require a change in government regulations to encourage them to fund circular businesses on a large scale and reduce their investment in linear businesses.

#2. Lack of proper waste infrastructure and poor recycling technology

Financial institutions, after conducting thorough risk assessment, may lose interest in funding circular businesses due to lack of proper waste infrastructure and technology. These issues can affect the ability of circular businesses to generate enough profit to repay loans owed to financial institutions. Many countries have very poor waste management infrastructure, and this explains why many materials such as plastics, end up in municipal water-ways, land, rivers and oceans in such countries (Stanislaus, 2018). Also, waste is often recycled using poor recycling technology, and majority of the recycled products are of low quality while only a small percentage of recycled products are of the same quality (Stanislaus, 2018).

#3. Lack of strategic guidelines and standardisation

The implementation of circular economy models varies significantly for different products and markets, therefore, it is difficult to provide individualized or sectoral general guidelines for each product (EMF, 2013).

#4. A very slow transition

The transition from a linear economy to a circular economy is likely to be very slow in developed and developing economies. The risk of a slow transition can affect the profit that financial institutions expect from lending to circular businesses and circular markets. Existing market frictions, lack of government support, lack of innovative financing instruments and lack of circular economy advisory services, contribute to slowing down the transition to a circular economy.

4. Benefits

4.1. Banks and the circular economy – what's in it for banks

Banks are facing intense pressure to provide sufficient funding to existing circular businesses. Banks also face pressure to fund businesses seeking to make a transition from a linear economy model to a circular economy model. EMF (2020) show that some banks have endorsed or shown commitment to support circular businesses. Such banks include BlackRock, Barclays, Citi, Credit Suisse, the European Investment Bank, the international business of Federated Hermes, Goldman Sachs, HSBC, LGIM, Lloyds Banking Group, ING, Intesa Sanpaolo, JPMorgan Chase, Morgan Stanley, Rabobank, Standard Chartered, and UBS (EMF, 2020). But what exactly are the benefits of a circular economy to banks?

#1. Loan diversification opportunities

Circular businesses are generally considered to be low-risk businesses. Funding circular businesses provides an alternative diversification opportunity for banks (Ozili and Opene, 2021). Banks can add circular businesses to their existing loan portfolio to reduce their overall risk profile.

#2. It leads to responsible and sustainable banking

Responsible banking requires banks to get involved in sustainable and durable projects that are of value to the society they operate in, while sustainable banking is an approach to banking that integrates environmental, social and governance (ESG) criteria into traditional banking. The circular economy model supports responsible banking and sustainable banking because the circular economy protects the environment, provides jobs by closing the loop in the production value chain, and leads to a better society. By funding the circular economy, banks will adhere to the principles of responsible banking, which ensures that banks engage in financing activities that promote a sustainable environment and a better society for the current and future generations.

#3. Increased lending to circular clients and the recycling sector

Banks need to identify existing corporate customers that need a change in their financing structure, especially customers that desire to make a transition to a circular economy. Banks should identify such customers early, and extend additional loans to them. Furthermore, as more companies seek to make a transition to a circular economy, proactive banks can win new circular clients and gain a large market share of customers in the circular economy, and this will mean more profit to proactive banks. On the other hand, reactive banks may struggle to gain circular customers.

#4. Correcting bad perception about banks in society

After the 2007-2008 global financial crisis, many members of society do not view banks as agents serving the best interest of society. The financial crisis left a bad impression about banks. Many banks made poor business decisions and were bailed out by the government while some citizens lost their money deposited in banks and the citizens were not bailed out by the government during the financial crisis (Ozili, 2020b). This left a bad perception about banks, and the effects are still being felt today through the populist movement in recent years (Bennett and Kottasz, 2012).

Today, banks are interested in funding the circular economy because they want to change the perception about banks as 'purely profit oriented agents'. By funding the circular economy, banks hope to win the trust of community members and the local authorities. Funding the circular economy also helps banks to avoid being targeted by ecological activists who may use violent and non-violent tactics to resist corporations whose activities damage the environment, and organizations that support such corporations. Activists may target banks for lending to corporations whose activities harm the environment. Banks can prevent this from happening by

funding circular businesses in the circular economy, and by making elaborate announcements about their circular economy activities.

4.2. The circular economy and other financial institutions – what's in it for them

#1. Insurance companies can create special insurance policies for reused products

Insurance companies can design special insurance policies for reused goods. These insurance policies will create conditions for goods to be used more extensively and for a longer period of time (Ilic et al, 2020). This will help to drive sales in circular markets as consumers will be more willing to buy and use recyclable materials that are insured.

#2. Investment companies and hedge funds will generate sustainability-adjusted return on their investment

Investment companies, such as hedge funds and private equity firms, will make competitive returns by turning sustainability challenges into investment opportunities when they invest in circular businesses. Hedge funds and investment houses will benefit from investing in circular businesses by generating sustainability-adjusted returns on their investment. As more investment companies deploy capital to the circular economy, profitability prospects in the circular economy will widen. This will attract more institutional investors to the circular economy.

#3. Microfinance institutions will receive more funding

Microfinance institutions will benefit from the circular economy revolution by receiving more funding from large banks and other financial institutions that have an interest in financing the circular economy. With this funding, microfinance institutions will be able to identify small businesses and entrepreneurs involved in circular business activities, offer them micro loans to support their circular business activities, gain their loyalty, and grow with them. Also, by empowering young entrepreneurs, microfinance banks can help to usher in a circular economy revolution at the grassroots level of society especially among the youths, and support the growth of local start-ups.

#4. Other financial institutions will enjoy greater patronage

Bank financing may be costlier due to high interest rate and regulatory restrictions while non-bank financial institutions will offer cheaper funds. For this reason, businesses will increasingly

seek funds from other financial institutions to take advantage of cheaper loan. This will help them to fund their transition to a circular economy.

#5. Support the development of second hand markets for recycled goods

Other financial institutions can provide the financing needed to develop second hand markets for recycled products. This will help to increase the value of recycled products and prevent them from being depreciated to zero. An increase in the sale of recycled goods in the secondary markets will generate higher revenue (Machado et al, 2019; Van Loon et al, 2018), and increase the profit of producers who can then repay the loan and interest owed to financial institutions.

#6. It will encourage collaborative funding for the circular economy

Some financial institutions may go the extra mile to create a syndicated sustainability fund which businesses can access to fund their transition from a linear economy to a circular economy. A group of financial institutions can work together to provide funds for large circular projects. They can also leverage on technology to gather additional data which can help them assess the viability of circular businesses for collaborative funding purposes.

#7. Circular economy financing is consistent with sustainable financing

Other financial institutions will benefit from supporting the circular economy because it fits into the trend towards sustainable finance that many other financial institutions are embracing.

Table 2 below summarises the benefits of the circular economy to banks and other financial institutions.

Table 2: Benefits of circular economy		
	Banks	Other financial institutions
1	It offers loan diversification opportunities	Insurance companies can create special insurance policies for reused products
2	It leads to responsible banking and sustainable banking	Investment companies and hedge funds will generate sustainability-adjusted return on their investment
3	Increased lending to circular clients and the recycling sector	Microfinance institutions will receive more funding
4	Correcting bad perception about banks in society	Other financial institutions will enjoy greater patronage
5		Support the development of second hand markets for recycled goods
6		It will encourage collaborative funding for the circular economy
7		Circular economy financing is consistent with sustainable financing

5. Conclusion

In this paper, I identified some benefit of the circular economy to banks and other financial institutions. I began by providing a conceptual framework on the circular economy. Thereafter, I offered some criticism against the circular economy. Some of which are that: (i) all waste are not recyclable, which means a 100% circular economy cannot be achieved; (ii) the cost of recovering waste may be too high; (iii) the circular economy agenda views the world through an engineering lens; (iv) a circular economy may lead to reduced production and consumption of new resources and new goods; (v) the circular economy may not survive without government support, (vi) a government-led circular economy agenda may hurt linear businesses whose waste are biodegradable, (vii) hidden risks are inherent in circular models, and (viii) some investors may not be interested in the circular economy due to low return on investment.

Some benefit of the circular economy to banks include the following: (i) greater loan diversification opportunities, (ii) promotes responsible banking and sustainable banking, (iii) increased lending to circular clients and the recycling sector which means more profit for banks, and (iv) it can correct the bad perception about banks in society. Some benefit of the circular

economy to other financial institutions include the following: (i) issuance of special insurance policies for reused product; (ii) greater sustainability-adjusted return on investment; (iii) greater funding to microfinance institutions; and (iv) more opportunities for collaborative funding to circular businesses.

The implication of the findings is that financing the circular economy creates a new opportunity for financial institutions. It offers new opportunities for financial institutions to participate in green project financing, leasing and green corporate bonds. Financial institutions that are slow to understand and adapt with the needs of businesses in the circular economy may become less competitive and lose market share while financial institutions that respond quickly to the needs of businesses in the circular economy will gain market share and have better profitability prospects.

Financial institutions will continue to face greater pressure to play a lead role in financing circular businesses. Not all financial institutions will be interested in funding the circular economy. This is because some financial institutions and other observers have concerns about the sustainability of a circular economy. Specifically, there are concerns that government regulations create waste. There are also concerns that poor waste infrastructure, poor recycling technology, lack of strategic guidelines and standardization, and the slow transition to the circular economy are major constraints to the actualization of a sustainable circular economy.

A limitation of the study is that no data was used to assess the perceived benefits of the circular economy to banks and other financial institutions. This was due to the non-availability of circular economy data for financial institutions. Future studies can use available data to assess the perceived benefits of the circular economy to banks and other financial institutions when such data become available.

List of Abbreviations

EMF - Ellen MacArthur Foundation

GDP - Gross domestic product

ESG - environmental, social and governance

Reference

Asokan, P., Saxena, M., & Asolekar, S. R. (2010). Recycling hazardous jarosite waste using coal combustion residues. *Materials Characterization*, *61*(12), 1342-1355.

Bao, Z., Lu, W., Chi, B., Yuan, H., & Hao, J. (2019). Procurement innovation for a circular economy of construction and demolition waste: Lessons learnt from Suzhou, China. *Waste Management*, 99, 12-21.

Bennett, R., & Kottasz, R. (2012). Public attitudes towards the UK banking industry following the global financial crisis. *International Journal of Bank Marketing*, 30(2), 128-147.

Blomsma, F., & Tennant, M. (2020). Circular economy: Preserving materials or products? Introducing the Resource States framework. *Resources, Conservation and Recycling*, *156*, 104-698.

Bolger, K., & Doyon, A. (2019). Circular cities: exploring local government strategies to facilitate a circular economy. *European planning studies*, 27(11), 2184-2205.

Del Borghi, A., Moreschi, L., & Gallo, M. (2020). Circular economy approach to reduce water–energy–food nexus. *Current Opinion in Environmental Science & Health*, *13*, 23-28.

Dewick, P., Bengtsson, M., Cohen, M. J., Sarkis, J., & Schröder, P. (2020). Circular economy finance: Clear winner or risky proposition? *Journal of Industrial Ecology*, *24*(6), 1192-1200.

EMF (2013). Towards the Circular Economy. Ellen MacArthur Foundation. London, UK.

EMF (2020). Financing the circular economy: capturing the opportunity. Ellen MacArthur Foundation. London, UK.

Esposito, M., Tse, T., & Soufani, K. (2017). Is the circular economy a new fast-expanding market? *Thunderbird International Business Review*, *59*(1), 9-14.

Frosch, D., & Gallopoulos, N., (1989). Strategies for manufacturing. Sci. Am. 261 (3), 94–102

Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The Circular Economy–A new sustainability paradigm? *Journal of cleaner production*, *143*, 757-768.

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner production*, *114*, 11-32.

Goyal, S., Esposito, M., & Kapoor, A. (2018). Circular economy business models in developing economies: lessons from India on reduce, recycle, and reuse paradigms. *Thunderbird International Business Review*, *60*(5), 729-740.

Hartley, K., van Santen, R., & Kirchherr, J. (2020). Policies for transitioning towards a circular economy: Expectations from the European Union (EU). *Resources, Conservation and Recycling*, *155*, 104-634.

Ilic, B. S., Djukic, G. P., & Balaban, M. M. (2020). Sustainability of Mandatory Pension Insurance in the Circular Economy: A Comparative Analysis. In *Handbook of Research on Entrepreneurship Development and Opportunities in Circular Economy* (pp. 125-143). IGI Global.

Ivashina, V., & Scharfstein, D. (2010). Bank lending during the financial crisis of 2008. *Journal of Financial economics*, 97(3), 319-338.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, conservation and recycling*, *127*, 221-232.

Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). Circular economy: the concept and its limitations. *Ecological economics*, *143*, 37-46.

Kristensen, H. S., & Mosgaard, M. A. (2020). A review of micro level indicators for a circular economy–moving away from the three dimensions of sustainability? *Journal of Cleaner Production*, *243*, 118-531.

Lag-Brotons, A. J., Velenturf, A. P., Crane, R., Head, I. M., Purnell, P., & Semple, K. T. (2020). Resource Recovery from Waste. *Frontiers in Environmental Science*, *8*, 35.

Lin, B. C. A. (2020). Sustainable Growth: A Circular Economy Perspective. *Journal of Economic Issues*, *54*(2), 465-471.

Lo, A. Y., & Yu, X. (2015). Climate for business: opportunities for financial institutions and sustainable development in the Chinese carbon market. *Sustainable Development*, *23*(6), 369-380.

Machado, M. A. D., de Almeida, S. O., Bollick, L. C., & Bragagnolo, G. (2019). Second-hand fashion market: Consumer role in circular economy. *Journal of Fashion Marketing and Management: An International Journal*. 23(3), 382-395

Mezher, T., Jamali, D., & Zreik, C. (2002). The role of financial institutions in the sustainable development of Lebanon. *Sustainable Development*, *10*(2), 69-78.

Mitschke-Collande J, and Narberhaus, M. (2019). Circular economy isn't enough. We need system change. The Green economy coalition. https://www.greeneconomycoalition.org/news-analysis/circular-economy-isnt-enough-we-need-system-change

Morseletto, P. (2020). Targets for a circular economy. *Resources, Conservation and Recycling*, 153, 104-553.

Ozili, P. K. (2020a). Effect of climate change on financial institutions and the financial system. In *Uncertainty and Challenges in Contemporary Economic Behaviour*. Emerald Publishing Limited.

Ozili, P. K. (2020b). 100 Quotes from the Global Financial Crisis: Lessons for the future. In *Uncertainty and Challenges in Contemporary Economic Behaviour*. Emerald Publishing Limited.

Ozili, P.K. and Opene, F.U. (2021). The role of banks in the circular economy. *World Journal of Science, Technology and Sustainable Development*.

Peeters, H. (2005). Sustainable development and the role of the financial world. In *The World Summit on Sustainable Development* (pp. 241-274). Springer, Dordrecht.

Sauvé, S., Bernard, S., & Sloan, P. (2016). Environmental sciences, sustainable development and circular economy: Alternative concepts for trans-disciplinary research. *Environmental Development*, *17*, 48-56.

Shen, K. W., Li, L., & Wang, J. Q. (2020). Circular economy model for recycling waste resources under government participation: a case study in industrial waste water circulation in China. *Technological and Economic Development of Economy*, *26*(1), 21-47.

Singh, J., & Ordoñez, I. (2016). Resource recovery from post-consumer waste: important lessons for the upcoming circular economy. *Journal of Cleaner Production*, *134*, 342-353.

Stahel, W. R. (2016). The circular economy. *Nature News*, *531*(7595), 435.

Stanislaus, M. (2018). Barriers to a Circular Economy: 5 Reasons the World Wastes So Much Stuff (and Why It's Not Just the Consumer's Fault). *World Resources Institute*. Available at: https://www.wri.org/blog/2018/05/barriers-circular-economy-5-reasons-world-wastes-so-much-stuff-and-why-its-not-just

Van Loon, P., Delagarde, C., & Van Wassenhove, L. N. (2018). The role of second-hand markets in circular business: a simple model for leasing versus selling consumer products. *International Journal of Production Research*, *56*(1-2), 960-973.

Velenturf, A. P., Purnell, P., Tregent, M., Ferguson, J., & Holmes, A. (2018). Co-producing a vision and approach for the transition towards a circular economy: perspectives from government partners. *Sustainability*, 10(5), 1401.

Wang, P., Kara, S., & Hauschild, M. Z. (2018). Role of manufacturing towards achieving circular economy: The steel case. *CIRP Annals*, *67*(1), 21-24.

Weber, O. (2014). The financial sector's impact on sustainable development. *Journal of Sustainable Finance & Investment*, 4(1), 1-8.