CHAPTER 1

CIRCULAR ECONOMY, SUSTAINABLE DEVELOPMENT AND THE ROLE OF ISLAMIC FINANCE

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Abstract

Based on an extract-produce-consume-waste mechanism, the conventional linear economy requires enormous extraction and wasteful production & consumption. This results in several tribulations and threats to the earth's climate such as rising global warming due to greenhouse gas emissions, erosion of the ecosystem, diminution of natural resources, and the release of toxic waste into the natural habitat. To mitigate these challenges and to rescue the earth's climate from the devastation caused by the linear economic system, the importance of introducing and implementing a circular economic model is inevitable. A circular economy is based on a closed loop/cycle of production through consumption which facilitates limited use of materials and resources, minimal emission of hazardous elements into the nature, and a highly efficient waste management system to ensure recycling and reuse of residuals into further production. The Islamic financial system, being a pioneer in financing Sustainable Development, can be a major driver in the transformation towards a circular economy. The principles of Islamic finance, accompanied by Shari'ah regulations and Sustainable Development Goals (SDGs), will provide a solid guideline and framework as well as ample amount of funding sources for effective transition of the linear economy into the circular paradigm.

Keywords: circular economy; sustainable development; Islamic finance; maqasid; green sukuk.

JEL Classification: O44, P4, Q01

1. Introduction

Today's global economy is run by a linear system, which entails a process known as extract-produce-consume-waste, resulting in more than 60 billion metric tons of natural resources being extracted per year and more than 13 billion metric tons of waste being discharged into nature. As a result of this enormous extraction and wasteful production & consumption, the earth's climate has been exposed to a number of tribulations and threats such as mounting global warming due to greenhouse gas emissions, degeneration of the ecosystem, diminution of natural resources, and release of toxic waste into the natural habitat (6th GEF Assembly, Vietnam, 2018). Being one of the major social and economic drivers, this linear paradigm is greatly reducing the stability and capacity of the earth's systems to recover. This, in turn, is adversely affecting human livelihood and the global environment.

The linear economic model capitalizes on extracting the earth's scarce resources and using them in manufacturing, without any scope for reuse of the residuals and/or recycling of the used goods into further production. Raw materials are used to make final products, which are squandered as they reach the maximum level of usage i.e. marginal utility of consumption starts to decline. Due to the ever-growing population of the earth and this extravagant nature of production and consumption, we are heading towards a crisis where there will be a lack of resources and raw materials to meet the escalating demand for global production. The wasteful and unsustainable nature of economic activities is greatly damaging the natural and human environment and leading us to a world where there won't be enough food, drinkable water, and other necessities for future generations.

Instituting a circular economic model is of utmost importance in order to successfully mitigate these challenges and to rescue the earth's climate from the depredation of the linear economy. Utilizing public/private partnerships, the circular economic model will introduce a closed loop approach to production and consumption using environment-friendly resources, sustainable product designs, efficient industrial processes, and effective waste management systems. Replacing the linear economic model with a circular alternative will enable us to treat the environment in the way that it should be treated. By reducing mass extraction of earth's natural resources and emission of greenhouse gases and other hazardous substances, we will be able to deal with the environment in a more sustainable way. Transformation of the linear economic model into a circular one will demand a highly technical and efficient approach, which in turn will create businesses and workforce opportunities, promote employment growth and economic development, save billions of dollars of reinvestment, and help nations thrive and succeed in every aspect of their economy.

To introduce and promote a circular economic model and to achieve its underlying objectives, what is needed is the creation of the kind of economy where the ‘end-of-life’ concept is replaced by the choice of minimizing and reusing waste through sustainable design of materials, products, systems, and business models. In order to achieve the full benefits of a circular economy, the model is reliant upon cooperation within sectors and supply chains, and across countries. But there is over-reliance upon financing and investors who recognize that the risks of the linear system can unlock new opportunities. In order to maintain the spirit of the circular economy, providing an effective and sustainable source of financing is the key for the financial needs of the implementation of circular economy. This paper will guide on the perspective of Islamic Finance in introducing circular economy, building a bridge between circular economy, SDGs and Islamic finance, and supporting an effective transformation of the traditional linear economy into a circular system.

This paper is a systematic review of existing literature for which a number of steps are followed. It attempts to provide the key definitions related to the circular economic model. It identifies and reviews the most relevant and significant studies that have been undertaken. Only peer-reviewed journal articles are considered, and a minimum number of citations were required for less recent publications. Based on searching for keywords and screening of the abstracts, a precise list of papers/publications was selected for thorough review. A significant number of publications were rejected as they fail to build a bridge between circular economy and Islamic finance i.e. how Islamic finance can play a significant role in the implementation of circular business models. After selection of the final list of publications to be reviewed, all papers/studies have been analyzed based on their problem statement, theoretical underpinnings and literature review, methodologies used, key findings/results, and directions for future research.

This paper has been divided into five sections. In section 2, an extensive theoretical framework for circular economy and a brief analysis of the literature is presented where the evolution and history of circular economy are discussed. Section 2 also examines the connection between circular economy and sustainable development and identifies the potential risks and barriers to circular economy. Section 3 begins with a discussion of the emergence/reform of Islamic finance in the global financial system and addresses how Islamic finance is linked to sustainable development goals (SDGs). Section 4 attempts to build a bridge between circular economy, sustainable development, and the Islamic financial system. How Islamic finance can help to introduce and support the implementation of circular economy and SDGs is also discussed in section 4. Finally, section 5 concludes and provides directions for future research.

2. Theoretical Framework and Literature Review

There is a direct and positive association between economic development and scarcity of global resources (Krausmann et al., 2009). According to the Global Footprint Network (2015), about one and a half times the earth's resources are used to meet the yearly needs of global production. Furness et al. (2012) documented that this usage of earth's scarce resources has been following an upward trend despite the expansion of the global middle class. The existing method of operation in the majority of global industries is based on a linear i.e. extract-produce-consume-waste approach, which, regardless of the global recycling and sustainability efforts, is leading the world to a failed system aimed at economic development while ignoring the innovation and technological disruptions (Arpin et al., 2016). The failure and devastation of the existing linear economic system gave birth to a debate about the need for the linear model to be transformed into a circular economic model. Circular economy is a brand-new concept capitalizing on a closed/loop approach that can drastically transform the existing way of manufacturing, production, and consumption (The Forum of Young Global Leaders, 2015). Challenging the extravagant and detrimental linear system, the circular economic model will break the vicious cycle (Butterworth et al., 2014). Through the introduction and implementation of eco-friendly and sustainable production techniques, circular economy will create a transformative and thrifty global market ensuring value creation and economic flourishing for every nation (Raksit, 2014). Moving the existing global concern away from efficiency and sustainability, a circular economy will assure increased productivity, efficiency, and capital effectiveness while at the same time using fewer resources (Butterworth et al., 2014).

A circular economic approach, in contrast to the traditional linear model, is an economic system with the primary goal of making the best and most sustainable use of resources by increasing efficiency and thereby reducing waste. It aims at value creation through efficient use of resources and drastic transformation of production and consumption techniques (Kirchherr et al., 2017). The greater part of circular economy literature emphasizes its production benefits (Rizos, Tuokko, & Behrens, (2017), value creation ability (Lewandowski, 2016), and social advantages encompassing an economic model based on renewable energy and resource efficiency (Wijkman et al., 2015). According to Hobson et al. (2016), a circular economy has the ability to bring massive changes to the day to day lives of people although the scientific literature fails to provide enough understanding of such alterations and the strategies involved in promoting a circular economy (Repo et al., 2018).

There is much in the literature that focuses on the barriers to a circular economy highlighting a number of factors which impede the dispersal and the felt advantages of circular business models. Based on an extensive survey of European businesses, Kirchherr et al. (2017) reported that lack of consumer awareness, which is vital for recycling efforts, is one of the major drivers hindering a transition towards a circular economy. Studying small and medium enterprises trying to implement circular business models, Rizos et al. (2016) came up with similar findings and pointed to lack of support from demand networks. Van Eijk (2015) provided general insights on the drivers of and barriers to a circular economy. Examining the relationship between sustainability and circular business models, Geissdoerfer et al. (2017) denied referring to consumer aspects as the major barrier to a circular economy. According to (Ghisellini, Cialani, & Ulgiati, 2016), consumers are the passive drivers and it is rather the production-side factors that are affecting the effective transition from linear to circular economy.

Based on an extensive analysis of scientific and grey literature, Kirchherr et al. (2017) provided a precise and thorough definition of a circular economy: “A circular economy is an economic system that replaces the ‘end-of-life’ reducing, alternatively reusing, recycling and recovering materials in production and consumption processes. It operates at the micro level (products, companies, consumers) as well as macro level (city, region, nation, and beyond) with the aim of accomplishing sustainable development, thus simultaneously creating environmental quality, economic prosperity, and social equity, to the benefit of current and future generations.” (p. 229). A circular economy minimizes the emission of harmful gases and other hazardous substances into nature. The circular economic model uses a closed loop of production and manufacturing that facilitates significant waste reduction through effective recycling and refurbishing of materials. It saves a great deal of time and money by minimizing the residual loss of production. Critics may argue that since a circular economy follows a sustainable method of production i.e. using waste or leftovers for reproduction, it may reduce the quality of products and services and hence have a negative effect on overall business profits. However, a circular economy enables firms and manufacturers to gain increased profits by minimizing the cost of production through increased efficiency and an effective inventory management system. Figure 1 illustrates the comparison between linear and circular economy.

Figure 1: Linear vs. Circular economy

2.1. History of Circular Economy

The first articulation of the term ‘circular economy’ was developed by Kenneth Boulding during the early 1970s. In his essay titled “The Economics of the Coming Spaceship Earth” he came up with the idea of a clear distinction between open and closed economies. According to Boulding (1966), in an open economy resources are wasted and lost to nature during production, whereas in a circular economy resources are kept and preserved during the production process to be reused for future production.

Unlike the traditional linear model, the circular economy is based on a non-linear i.e. circular/closed system from which the fundamental theory and practice of circular economy has evolved. The theoretical underpinnings of a circular economy are greatly influenced by pertinent ideas and concepts such as ‘cradle to cradle’ (a biomimetic/synthetic approach circulating resources in the production process to ensure healthy and efficient production), ‘industrial ecology’ (the study of sustainable resource flows through production), ‘blue economy’ (a viable use of aquatic resources to counteract scarcity and foster economic growth), and so on.

Pearce and Turner (1989) worked extensively on the theory and modeling of circular economy. In their renowned book “Economics of Natural Resources and the Environment,” they thoroughly critiqued the traditional (linear) economy, which they defined as a faulty and inefficient system with a certain residual loss of production and no scope for recycling or reuse of the residuals. Jackson (1996) wrote a famous book titled “Material Concern” in which he incorporated the ideas of Walter R. Stahel, Bill Rees, and Bob Costanza. He

established the core idea of preventive environmental management by replacing the traditional extractive linear economic model with a circular and more efficient one. Walter R. Stahel, the father of Performance Economy, is well known for his extensive thoughts and efforts with regard to introducing and explaining the idea of a circular economy. In 2019 he published a book titled “The Circular Economy – A User’s Guide” where he summarized more than thirty years of his research on the field of Circular Economy.

2.2. Evolution of Thought

In the book titled “Jobs for Tomorrow: The Potential for Substituting Manpower for Energy” Stahel and Reday (1981) created a vision of a circular economy and its potential influence on the development of economics and other aspects of human lives. The authors were the first to explain how a circular economy, unlike its linear counterpart, can be introduced to achieve minimization of mass extraction, effective waste management, and creation of new jobs and business opportunities. Stahel’s institute is considered to be one of the oldest and most fundamental think tanks for circular economy and sustainable development. His ideas were soundly based on the objectives of creating high performance and long lasting output, understanding production from the perspective of delivering services rather than manufacturing goods, making the best use of resources through effective management and reuse of waste, fostering employment by creating new opportunities for businesses, and finally ensuring effective and sustainable economic development.

Introduced in 2006, China’s 11th five-year plan was considered a remarkable national policy for introducing a circular economy and promoting sustainable development. In recent years, the concept of a circular economy has gained enormous exposure and coverage by the Ellen MacArthur Foundation, which has summarized and disclosed the economic scope and environmental benefits of such an economy by combining the harmonizing schools of thought with a view to developing a logical framework. Circular economic strategies need to be introduced and implemented by nations in order to meet the targets for energy and water consumption as well as emission reduction. Circular economy can greatly contribute towards the achievement of the COP 21 Agreement (also known as the Paris Agreement), a new international agreement led by the Paris Climate Conference, which has the aim of reducing global warming to below 2 degrees centigrade. However, as argued by ecologists and environmentalists, global warming should be reduced to 1.5 degrees centigrade or below and an additional reduction of 15 billion metric tons of CO₂ gas emissions is needed by the end of 2030. The successful accomplishment of these goals hinges on the replacement of the traditional linear model with circular economic strategies.

2.3. From Linear to Circular Approach

The traditional linear model, based on the produce-make-waste approach, is extremely inefficient in that it consumes/extracts an unlimited amount of resources from nature and wastes much of it during the production process. The circular economy is a combination of economic, environmental, technological, and social issues (Slavik et al., 2018). The circular economic model, in contrast to the traditional one, cares about nature and living systems. In a circular process, a finite amount of resources is extracted from the environment based on the need for production and is utilized in a more efficient and sustainable manner during the production process. Basically, in a circular economy the residual amount that is lost in the production process is restored and recycled for the purpose of reuse and output. The circular economy is a regenerative method that views the production process as a system of organisms producing nutrients (waste) that can be reused and put back into the process.

As mentioned earlier, Walter R. Stahel has become one of the most prominent thinkers and scholars in the field of sustainable development through his introduction of a circular economy. Stahel, a Swiss architect and environmental analyst, is known as the father of ‘Performance Economy,’ which was founded on the concept of circular economy and its impact on waste management & emission minimization, economic competitiveness, and employment creation. In 2002, German chemist Michael Braungart and American architect Bill McDonough introduced the concept of ‘Cradle to Cradle,’ which has been founded on Stahel’s idea of circular economy and industrial sustainability. ‘Cradle to Cradle’ conceptualizes on three elements: elimination of the concept of waste, maximization of renewable energy, and celebration of diversity by respecting human and natural systems. Parker (1982) developed a closed production model by researching efficient waste management systems with the aim of considering waste as a resource for the UK agricultural sector.

Developed by McKinsey & Company and commissioned by the Ellen McArthur Foundation in 2012, a report entitled “Towards the Circular Economy: Economic and Business Rationale for an Accelerated Transition” was the first of its kind to discuss and analyze the opportunities and advantages of a circular economic model. The report was based on the results of product-specific case studies and economic analysis throughout the European Union. The report argued that with the implementation of circular economic strategies, a portion of the industrial sector of the European Union could save input costs of around \$600 billion per year, which would enable the nations in that region to foster economic activities in the segments of new product design and manufacturing of recycled and refurbished products. Several key building blocks regarding the transition towards a circular economy were also identified in the report.

Ranta et al. (2018) were the pioneers in researching and analyzing the potential implementation of a circular economic model in the United States. Following Cristopher Scott, they analyzed the institutional mechanisms of the circular economy model in different places throughout the world. Their argument was based on the distinction between two different types of industrial processes: (a) product-oriented manufacturing and (b) waste management-oriented production process. They gave great attention to studying Dell, one of the largest electronic manufacturers in the U.S., which also happened to be the first mover in manufacturing refurbished computers and offering free recycling services to its customers. They also studied the case of Republic Services, one of the biggest waste management corporations in the U.S., to analyze the feasibility and benefits of waste management-oriented production processes.

2.4. Circular Economy and Sustainable Development

Clearly, the circular economy is designed to be more sustainable and ecology-friendly in comparison to the traditional linear economic model. This can easily be inferred when the SDGs, of which the six main elements are shown in Figure 2, along with the operation of circular economy, are studied. Unlike the linear production process, a circular economy minimizes the use of raw materials and the discharge of emission and waste into the environment (Elia, Gnoni, & Tornese, 2017) and maximizes efficiency and value addition in the production process (Di Maio & Rem, 2015). However, critics of the circular economy argue that the potential benefits as well as the feasibility of a circular economy are oversimplified and under qualified.

Figure 2: Sustainable Development Goals (SDGs)

They argue that the potential complications that will arise from the transformation of the linear to the circular model are highly disregarded. Supplemental strategies might be required to be put in place in order to support more energy-efficient machinery and production techniques. Apart from these negative arguments, which are not strongly supported by evidence, the advantages and opportunities of a circular economy are beyond imagination. Due to its enormous scope and potential, circular economy has gained significant research attention in recent years (Geissdoerfer et al., 2017).

2.5. Financial Aspects of Circular Economy

Circular economic models gained the attention of experts and policy makers not only because of their environmental benefits but also because of their tremendous potential from a financial valuation perspective. Conventional finance mostly cares about the cost of capital and the future cash flows to be generated by investment of the capital. Conversely, circular business models are concerned about the stability and sustainability of the future cash flows. Stakeholders in a circular business model take part in sustainable economic processes through sharing of information with a view to having constant feedback that helps reduce the businesses' exposure to financial and ecological crises in the future. Circular economic models are more likely to be able to minimize their financial costs, resulting in a greater amount of profits. Lower cost of capital resulting from sustainable and less volatile future cash flows is in the core of the financial benefit.

Being a relatively new concept that is still under experiment, a circular economy fails to provide sufficient data and/or empirical evidence in regard to the sustainability of future cash flows to be generated by circular business models. In the main, lack of funding becomes a vital issue and a major obstacle for circular economic models stemming from a lack of investors' confidence. Investors require evidence i.e. a track record indicating the feasibility and hence profitability of the circular business models. They need to be assured of the ability of these models to successfully create value, both socially and financially. Due to the lack of data and proven track record of success, circular economic models are perceived as potentially risky investments. Large firms who have benefited through the adoption of circular business models may contribute significantly to the industrial literature and help attract future investments towards sustainable financing.

Cost of financing is probably the most crucial aspect of valuation facing financial institutions and other business organizations regardless of their nature of business. The fundamentals of finance suggest that investors need to be compensated with extra returns in

response to additional units of risk or uncertainty. The higher premium paired with the higher amount of risk helps investors to get cushion against adverse future circumstances. Circular economy is a relatively new concept that is yet to be tested for successful and effective implementation. Investing in circular business models leads investors to be exposed to higher levels of uncertainty for which they must be rewarded with a higher premium. Lack of historical data accompanied with higher levels of uncertainty cause circular economic models to exhibit a much higher cost of capital as compared to their conventional counterparts.

Despite a higher cost of capital because of high uncertainty stemming from lack of evidence, circular economic models are still good buys because of their intangible benefits. Circular economies are based on collaborative efforts and cultivating relationships among stakeholders. Sustainable processes and reliable stakeholder relationships are important intangible assets substantiating the valuation of circular economic models. Unlike those of traditional business models, valuation of a circular economy is based on the valuation of a number of embedded options/benefits associated with the sustainable nature of the circular businesses. Valuation of implicit real options is one of the vital issues that has tremendous implications for the financial aspect of circular economic models.

2.6. Challenges and Barriers to Circular Economy

Despite the never-ending benefits of the circular economy, the transformation towards it from the existing system will be highly challenging. In addition to the developing and least developed regions of the world, many developed nations lack infrastructural and technological competitiveness in terms of effective transition towards the circular economic system. Industries in many developed nations are not well equipped to implement and transform to a circular model. According to Lacy et al. (2015), strategic and operational designs in most firms are deeply rooted in the traditional linear model, which will make it difficult and complicated for them to switch to a circular model. However, many countries will benefit greatly from the transformation if they can successfully make the transition. Reichel et al. (2016) suggested that effective transition policies are needed beforehand in order to minimize the potential failures and make the transition beneficial for all nations.

Despite the reduction of cost and price risk, the implementation of a circular economy will require big investments for which businesses may not be prepared. Even though mature firms may find it affordable to finance such massive transformations, firms in the early and growth stages of development will surely find it challenging to support and cope up with these changes. Moreover, cost savings from circular economies will not be immediately available

and there may be some hidden and sunk costs as well (Yacob et al., 2013). Another potential limitation is lack of cooperation and support from suppliers due to their inability to quickly adapt to the transformation. Supply chains designed primarily for the linear model may require massive restructuring in their operations, which in turn will be a great barrier for the effective and timely implementation of the circular economy. Lack of regulations and/or difficulty with enforcement of laws may turn out to be potential institutional barriers. Absence of proper policies to design and implement circular models will create hurdles as well. Bastein, Roelofs, Rietveld & Hoogendoorn (2014) mentioned that adverse regulations as well as hostile behavior may restrict some firms from using the output of other firms as their inputs. In general, the barriers to implementing a circular economy can be classified into the four interrelated categories: Technological and infrastructure, market, regulatory, and cultural.

Firms with a conservative culture regarding investments and innovation may cause barriers for firms with more aggressive expansion and development strategies. In fact, the former group will create a lack of awareness among consumers regarding circular design, production, and usage of goods and services. Thus, the cultural barrier will result in a further technological barrier. Regulatory and market barriers are highly interrelated as well. Circular business models will encounter limited funding opportunities due to their limited/circular procurement. They may find it difficult to demonstrate that they have a potential market even in the absence of such procurements, which may discourage policy makers from promoting the transformation to a circular economy. Thus, regulatory barriers may result in market barriers which will create further regulatory barriers. The interdependence of these four categories of barriers may result in the failure to adapt to the circular economic model. However, potential insights and effective strategies can be formulated by studying and analyzing these barriers and their adverse impact on the transition to a circular economy.

3. Emergence of Islamic Finance in the Global Financial System

Islamic finance is one of the fastest growing branches of the modern finance system. The drastic changes in the global political economy accompanied by frequent failures of the conventional financial system during the global financial crises resulted in the emergence of modern Islamic finance in the 1970s. Numerous experiments had been conducted before the formal introduction and implementation of Islamic finance took place. During the 1940s, loan cooperatives, based on the concept of western mutual loan experiments, were introduced in the Indian subcontinent. In the late 1950s, landlords in the rural areas of Pakistan devised the idea of interest-free credit. In 1963, the Muslim Pilgrims Savings Corporation was established in Malaysia for the purpose of helping people to perform the Hajj, which is the

biggest religious pilgrimage of the Muslim community. The corporation later transformed into an Islamic savings bank with the purpose of investing the savings of potential pilgrims as per the rules and guidelines of Shari'ah.

The most renowned and significant experiment was conducted by Dr. Ahmed Al-Najjar, the Secretary of the International Association of Islamic Banks (IAIB). Dr. Najjar, being greatly influenced by the mutual savings schemes that he observed in West Germany, conducted the experiment near the Nile Delta in Egypt during the years 1963 to 1967. He was supplied with capital by West German banks and was also supported by the government of Egypt. His initiative later grew into a bank with nine branches holding around 2 million Egyptian pounds in deposits from 2.5 million depositors. Even though the constitution of the bank was not based on Islamic or Shari'ah governance, the bank did not deal with any kind of interest exchange with its customers. Rather, the bank generated profits from investing its surplus funds (deposits) in trade and manufacturing activities. The bank provided funds to businesses on a profit-sharing basis. Even though the bank encountered several financial problems, these were not the reasons for its closure. It shut down mainly for political reasons such as the threat of Islamic fundamentalism, conflict over the governance of the bank, etc.

The Nasser Social Bank was established by the Egyptian government in 1971 with the objective of facilitating and supporting Islamic groups in their competition with leftist counterparts. Without having any direct attachment to religion, the main purpose of the bank was to support needy citizens by providing aid and social solidarity. Like the previous experiments, the bank's operations were conducted on the principles of Mudaraba, or profit/loss sharing. Many other experiments based on the Islamic view of financial management took place during the same time.

3.1. Islamic Finance in Theory and Practice

Islamic finance is broadly defined as the financial activities conducted by the followers of Islam. It refers to the financial operations that are conducted on the principles of the Quran and the teachings of the Prophet Muhammad (PBUH). The practices in Islamic finance are completely different from those in the traditional/conventional financial system, which does not follow any specific religious principle but is tailored and governed by humans to fulfill their transient benefits and interests. The definition of Islamic finance is beyond what is called 'interest-free'. The operations in Islamic finance may or may not be interest-free but they must be in accordance with the guidelines of the Quran and the Sunnah of the holy Prophet (PBUH). The fundamental Islamic principles suggest that any kind of financial exchange or transaction

must be free of *riba* & *gharar* and must capitalize on Halal activities. *Riba* is the unjustified increase in payables and *gharar* refers to uncertainty or risk which, if present in any financial transaction, may lead to speculation. Halal activities refer to those that are permitted (not prohibited) by Islam. The foundation of Islamic finance is based on two aspects: a philosophy of profit and risk sharing and the promotion of economic and social development through exercising specific religious practices such as *Zakah*. In sum, the major difference between conventional and Islamic finance is that the former focuses on profit/wealth maximization by one party whereas the latter believes in profit/loss and/or risk sharing by both parties.

Islamic finance is comprised of all sorts of financial services such as banking, non-bank financial services, asset management companies and mutual funds, insurance corporations, etc. Over the years Islamic finance has gone through enormous expansion. In addition to the increase in the number of solely Islamic banks and financial institutions, most conventional banks and other financial organizations have opened Islamic wings/windows to reach and serve the growing needs of this emerging sector.

3.2. Islamic Finance and Sustainable Development Goals (SDGs)

The foundation of Islam is based on the principle of sustainable use of livelihood and resources. In fact, the principles and practices of Islam refer to efficient use of resources, minimal discharge of harmful objects into nature, and effective waste management in order to minimize residual loss. Islam strongly discourages wastefulness and seriously warns its followers about the harsh consequences and punishments to be encountered in the afterlife. Islamic finance can play a vital role in developing and implementing sustainable development goals (SDGs). In fact, Islamic finance has become one of the major sources of substantial amounts of capital to finance the SDGs. Over the years, Islamic finance has experienced a significant growth of 10-12% per annum. Islamic finance has grown into a \$1.8 trillion industry that seeks to finance/support underprivileged Muslims as well as non-Muslims and contribute towards the development and implementation of SDGs.

To identify and explore the potential contributions of Islamic finance in achieving the SDGs, the 4th Annual Symposium on Islamic finance was held in Kuala Lumpur in December, 2018. The Symposium was co-organized by the World Bank Group, Islamic Research and Training Institute (IRTI), and International Center for Education in Islamic finance (INCEIF). The Symposium was attended by many leading academics, policymakers, members of both public and private sectors, and development communities, all of whom exchanged their ideas and impressions on the rapidly changing field of Islamic finance and the recent and new developments of the SDGs.

Sustainable Development Goals are supported by Islamic finance through innovative product design. For example, Islamic bonds, called Green Sukuk, promote eco-friendly investment and financing. Islamic endowment funds, such as Waqf, provide environment-friendly financing to Small and Medium Enterprises (SMEs). There are many other instruments such as FinTech, Islamic endowment funds for long term investments, etc., which are in place to promote and facilitate the implementation of SDGs.

To support Islamic financial institutions in achieving SDGs, a favorable environment must be established. In order for this to happen, legal and regulatory mechanisms should be strengthened and made more robust at the country level. At the international level, in addition to the global standards set by organizations like the Islamic Financial Services Board (IFSB) and the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), the standardization of regulations and of Shari'ah governance is very crucial. Islamic financial instruments have great potential to promote sustainable economic growth, alleviate poverty, strengthen livelihood strategies, improve basic services, and create more employment and business opportunities.

4. Building a Bridge between Islamic Finance and Circular Economy

4.1. Reform of Shari'ah Governance

It is the responsibility of Islamic financial institutions to ensure compliance with Shari'ah principles in terms of product design, operational strategies, management practices, etc. Due to Shari'ah compliance, Islamic financial institutions recognize certain rules and prohibitions that are not observed by their conventional counterparts. Shari'ah non-compliance risk arises when Islamic financial institutions fail to comply with the requirements and principles of the Shari'ah. Being solely pertinent to Islamic banks and financial institutions, the Shari'ah non-compliance risk gives rise to several concerns:

- Confidence of depositors, investors, customers, and other stakeholders of a particular institution or industry will deteriorate if the institution/industry fails to comply with the regulations of Shari'ah governance.
- Contracts containing Shari'ah-repulsive elements and ideas should be abandoned. The slight income from such contracts/transactions, which are non-halal (prohibited), must be transferred to charitable donations and cannot be kept by the bank or financial institution under any circumstance.
- Some legal costs may be incurred since future lawsuits may require payment for damages.

The Islamic financial system is not restricted to any specific regulation. In fact, it is self-regulated in terms of Shari'ah governance. Higher authorities do not interfere with the regulation of the Islamic financial industry even though there is a great necessity to regulate this relatively new industry. There is no single Shari'ah governance structure that is preeminent over the others. Regulatory and supervisory authorities in most jurisdictions may leave it up to Islamic financial institutions to decide on what kind of Shari'ah governance system to adopt. The industry is left free to determine the system that will provide adequate integrity to the goods and services that Islamic financial institutions offer. This autonomous nature of Islamic financial institutions has led to many warnings that Shari'ah control is ineffective in most cases. Even in countries like Malaysia, Oman, and Syria, all of which have a nation wide Shari'ah governance structure, this framework has not been useful enough to shore up the Shari'ah concerns related to lack of appropriate Shari'ah governance. Therefore, contemporary Shari'ah governance frameworks have been ineffective in accomplishing their ostensible objective as certifiers of Shari'ah compliance.

It is imperative for Islamic financial institutions that they do not influence and manipulate Shari'ah governance/regulations to meet their self-interests. The Shari'ah governance system must be highly vigorous in order to ensure the proper practice of Shari'ah regulations and the fortification of the Shari'ah image. Each Shari'ah shortcoming is related to some corresponding insufficiency in the existing Shari'ah governance framework. Therefore, the existing Shari'ah concerns need to be traced back to the practices of the industry in order to identify the problems inherent in the Shari'ah governance framework. The major Shari'ah concerns about the practices of the industry are as follows:

- The incursion of highly contentious and prohibited products and services, which are like those offered by conventional (non-Islamic) banks and financial institutions.
- The influence of Islamic financial institutions on Shari'ah regulators, including Shari'ah supervisory board members. This happens when one or more members of the regulatory board are selected from the management team who can influence the supervisory process for the purpose of attaining any undue and biased approval.
- The presence of incompetent Shari'ah controllers and regulators lacking essential knowledge and understanding; this in turn leads to flawed appraisals of financial products.

The above are some of the typical outcomes of a faulty Shari'ah governance system that fails to protect Shari'ah aspects within businesses. The two major Shari'ah concerns

encountered by Islamic financial institutions pertain to the authenticity and effectiveness of some Islamic financial products to implement Shari'ah control in Islamic finance. Clearly, these two concerns are interrelated since an ineffective Shari'ah control system will eventually lead to controversial products.

4.2. Scope of Blended Finance in the Islamic Financial System

There is no formal definition of blended finance in the Islamic finance literature. However, by looking at the fundamental objective of Islamic blended finance, which is to organize supplementary resources and to create a positive-sum situation, Islamic blended finance may be defined as an optimal combination of Islamic social funds (e.g. Zakah, Waqf, and Sadaqa) and penalties from misconduct with financial products for the purpose of financing effective social businesses to achieve SDGs. By offering a safety net, skills training, and venture capital to the needy as well as struggling entrepreneurs, Islamic social funds are used to alleviate fund diversion to barren activities and high default risk. By offering Islamic microfinance services, private capital can be drawn into the blended finance structure.

The major purpose of Islamic blended finance is to strengthen the intrinsic characteristics of Islamic finance and to discover commercially feasible markets such as refinancing the poorest entrepreneurs, amending the risk-return contour for money-making investors, and amplifying development resources for Sustainable Development Goals (SDGs). According to Gavas, Mustapha & Prizzon (2014) the purpose of blended finance is to guarantee the financial sustainability of businesses and their growth. Blended Finance has the potential to catalyze the flow of private capital into critical markets to achieve SDGs. However, its success depends on a high degree on its application as a tool (Tonkonogy, Brown, Micalé, Wang & Clark, 2018). As briefly illustrated in Figure 3, the justification is to create a win-win situation for all parties within the blended financial structure and to congregate more marketable capital through economically viable investment opportunities. The result of the blended transaction is a compassionate loan (qard) to small and medium enterprises, Murabahah for financial institutions, and fractional endowment for blended organizations.

Figure 3: Blended finance

1.3. Role of Islamic Finance in the Transformation from Linear to Circular Economy

The Islamic financial system will unlock an enormous amount of opportunities for the implementation of circular business models. It will develop and provide Shari'ah-compliant financing solutions to meet the massive investments required for the transition. Islamic finance is based on the principles of Islam and Shari'ah which have significant alliance with the sustainability concept of the circular economic model. Islamic finance can offer several specialized products or schemes which will directly facilitate businesses to finance a successful transition from the linear to circular business model. For example, *Green Sukuk*, which is also known as green Islamic bond, has been proven to be successful in financing sustainable and climate-resilient development in many nations. The fundamental of Green Sukuk is based on several concepts such as Islamic mutual funds, sustainable and ethical investment, and Sukuk i.e. Islamic concept of bond financing. Since Green Sukuk is one of the highly specialized products offered by Islamic financial institutions worldwide, the proceeds/funds generated from Green Sukuk can solely be invested to promote and implement circular economic models and thereby to achieve the sustainable development goals.

Unlike the conventional bonds issued by banks and financial institutions, Green Sukuk has several advantages. First, Green Sukuk is a well-known Islamic financial instrument that is readily tradable in the market and easily transferable as well. Second, this bond financing

is usually generated from a portfolio of investment projects, facilitating diversification of idiosyncratic risks. A lower level of risk is associated with a lower required rate of return. Funds generated from Green Sukuk can be invested into projects to mitigate the adverse effects of global climate change, protect water and marine resources from degradation, reduce production waste and facilitate recycling, prevent and control pollution, especially greenhouse gas emissions, and to support an effective transition from linear to circular economy. Countries that have pioneered in the practice of Islamic banking and finance, such as MENA and SEA countries have already started using Green Sukuk as a major financing technique to introduce and implement sustainable and circular economic systems. Being a unique combination of sustainable financing and Islamic financial principles, Green Sukuk is one of the fundamental and most demanding financing tools adopted by firms in their implementation of sustainable and circular economic systems. Green Sukuk is a great source of low-cost yet sustainable financing that can play a key role in the implementation of circular/business friendly projects such as production of renewable energy and recycling and reuse of waste into future production.

Due to the intrinsic structural advantage, Islamic banking and finance is a more feasible financing option to promote economic advancement and sustainable development. As proven during the financial crisis of 2008, Islamic financial institutions are less vulnerable in the face of unexpected aggregate/macroeconomic shocks. Founded on the principles of Shari'ah, Islamic finance is aimed at ensuring positive sum games i.e. risk minimization for all parties. Islamic finance is growing rapidly in the global financial market, even in some non-Muslim countries. Having operations in 32 countries, Islamic banks have total assets of more than USD 2 trillion worldwide.

Due to links with the real economy, Islamic banking helps reduce uncertainty in the financial system. Apart from its popularity among Muslims because of the consistency of Islamic banking products with their religious beliefs, Islamic banking is also adopted by non-Muslims. Undoubtedly, it is currently the fastest-growing banking industry. According to IFSB, the total Islamic banking assets were worth USD 1.5 trillion in 2017. Shariah-based banking is present in 31 countries having a dual financial system, and the number of jurisdictions where Islamic banking is systemically important (market share of more than 15% of total banking assets) increased to 12. About 88% of the Islamic banking assets are held in these 12 countries (IFSB, 2017).

In 2000, MDGs were set to protect the path of development and prosperity of future generations by the end of 2015. However, with the consensus of all nations, MDGs were

replaced with an updated version of SDGs at the beginning of 2015. SDGs state ‘the needs of the present generation without compromising the ability of future generations to meet their own needs’ (WCED, 1987). There are three main directions that need to be focused on to achieve this high vision: economic growth, social inclusion, and environmental protection. Until now, the role of Islamic finance has been very important in the first two dimensions. Islamic finance has seen considerable growth worldwide during the current decade. By 2017, the industry of Islamic finance showed a rapid growth of 11% to US\$ 2.4 trillion in assets or by compound annual growth rate (CAGR) growth of 6% from 2012. It was also predicted that the industry of Islamic finance might achieve the target of US\$ 3.8 trillion in assets by 2023 with an expected growth of 10% per year (IFDI, 2018). Though growth is significant, it is not the only factor to be taken into consideration. Social goals are equally important (Sadiq & Mushtaq, 2015).

The question of whether the Islamic idea of progress and development can be used as a benchmark for the desired shift from a linear to a circular economy became applicable during 2006 when the Islamic Development Bank (IDB) went through internal reform and a new ‘Vision 1440H’ for comprehensive human development (CHD) was formulated and adopted. The intellectual discourse concerning the reform, in fact, triggered an appeal for more detailed and formal academic works on the CHD, the first of these being Chapra’s (2008) “The Islamic Vision of Development in the Light of Maqasid al-Shari’ah”. Since then, a sizeable literature on the Maqasid and its contemporary applications has emerged. Tag el-Din (2013) is a good example of attempting to relate the Maqasid framework to achieve balanced socio-economic development in the free market economy. CHD is achieved by simultaneously upholding and preserving the human necessity for (a) religious belief, (b) life with self-esteem, (c) offspring and future generations, (d) responsibility and intellectuality, and (e) wealth and attractive nourishment. According to Chapra (2008) and Tag el-Din (2013), scholars like al-Ghazali, Ibn Taymiyyah, Ibn al-Qayyim, and al-Shatibi developed the Maqasid framework during the 12th and 14th centuries. The framework has remained as the architectural foundation of ideal Islamic economics and of its finance paradigm. As such, the Maqasid represents the local aspirations of society.

Economic development has always remained on the agenda of national governments with different ideological motivations, manifestations, achievements, and frustrations. In recent years, one measure of the progress of countries were the UN millennium development goals (MDGs). The MDGs era (2000-2015) ended with mixed results. Progress was made in several areas, but MDG-1, concerning the elimination of absolute poverty, remained largely

unaccomplished. This failure still endures in member countries of the IDB, as documented in the IDB MDG target study (Bello & Suleman, 2011). Since 2016, the UN has embarked upon a new development program called sustainable development goals – SDGs. In IDB member countries, SDG-1 is very similar to MDG-1 in scope and challenge. In this specific SDG, financial inclusion is a priority area and Islamic finance promotes access to financial services by removing the faith barrier to conventional finance.

Apart from SDG-1, there are several other similarities between the SDGs and MDGs. However, the SDGs are, in fact, a paradigm shift from MDGs. The MDGs followed the conventional capitalistic linear economy paradigm – its core being that the environment is not a resource and wealth creation is both the necessary and sufficient condition to cater to the interest of the economy and future generations. The SDGs, on the other hand, are augmented by the United Nations (UN) Global Compact Principles (GCPs), UN Principles of Responsible Investments (PRIs), and the Global Reporting Initiative (GRI & UN Global Compact, 2017). In addition to the UN, other institutions such as those of the European Union are actively engaged in a paradigm shift from a linear to an ecological and circular economy (see, for example, European Commission, 2017). In the existing linear paradigm, wealth creation could inflict further damage to the ecological environment, and hence could be disastrous in its consequences for the future security of humankind and other species. With this background, a new global financial architecture motivated by the SDGs implementation requirements is emerging, parallel to Basel III. In addition, the pressure on the existing global financial architecture is also increasing due to the emergence of distributed ledger technology (DLT) and potential financial disintermediation.

Another important area of paradigm shift is in the role of faith (local aspirations) as a positive motivating force for achieving SDGs, as compared to the MDGs regime, which took for granted that faith is a barrier to accessing health, educational, and financial services. Religious philanthropy and faith-based finance can enhance resources for the SDGs in the Reforming Islamic Finance for Achieving Sustainable Development Goals framework of a blended approach, along with public sector resources and private investments. Unlike the MDGs, the SDGs give importance to local realities, values, and institutions. More importantly, faith-driven policies like Islamic finance can be consistent with local aspirations and could be readily owned by the relevant population segments. This brings the SDGs closer to the Maqasid al-Shari'ah-driven CHD.

The paradigm shift in the SDGs opens opportunities for Islamic finance that were not available under the MDGs. Therefore, there is an expectation that Islamic finance can play an

important and wider role in achieving the SDGs. This potential role of Islamic finance can be enhanced by paradigmatic and regulatory reform and support as well as surveillance. In this regard, we identify the following broader areas for future research:

- Facilitating a shift from the linear economy paradigm to a circular economy paradigm.
- Transformation of the global financial architecture
- Developing synchrony between local aspirations (Maqasid al-Shari'ah), national goals, and the SDGs
- Reforming Shari'ah governance by taking into account the synchrony between local aspirations, national goals, and the SDGs, and by integrating the Islamic institutions of compassion in financial sector reforms
- Strengthening the Islamic financial architecture by removing structural risks in the design of financial products
- Incentivizing waste control and management and promoting SMEs in the ecological/circular economy
- Encouraging integrated reporting on SDGs

Implementation of circular economic concept is crucial for OIC countries because of the special environmental challenges they face. According to the Environmental Performance Index (EPI) measured by Yale University, OIC countries scored 59.4 out of 100, whereas the average for non-OIC countries is 65.4 and for developed countries it is 85.4. This poor performance for OIC countries is consistent with the unique environmental issues faced by these countries. However, the average growth rate of OIC countries (4.4% during the 2000s) was pretty impressive, whereas the growth for developed nations was in a declining trend.

Among the OIC member countries, Qatar has made tremendous progress in adopting sustainable business and financial processes. According to Brooks et al. (2006), Qatar is characterized as a high temperature land with low rainfall, strong winds, and low soil nutrients, leading the country to a number of environmental and ecological issues. This means that recovery of the terrestrial ecosystems from interference is prolonged. Qatar is considered to be one of the most hostile and delicate environments on earth (Richer, 2009). Rapid industrialization and high population growth that have occurred in Qatar in the past few decades have worsened the country's environmental fragility (Luomi, 2012a). The average carbon footprint in the world is 1.6 ghp, whereas for some OIC member countries such as Saudi Arabia, Turkey, and Malaysia, the footprints are above the global average.

Unlike Qatar, average carbon footprints for Nigeria, Pakistan, and Morocco were below the world average. Even though Saudi Arabia is one of the largest energy producers/suppliers of the world, its carbon footprint was 5.11, resulting from its relatively high population. Compared to its neighbors as well as to other OIC member countries, Qatar has been at the top of the ranking with close to 15 ghp on the ecological footprint, reflecting its carbon footprint, fishing ground, cropland, forestry, grazing land and others among the criteria. Qatar's score is more than twice the score of 6.23 ghp of Saudi Arabia and far higher than the global average of 2.75 ghp. A number of noteworthy initiatives have been taken by Qatar to tackle the high carbon emissions through reduction of flaring and others. Qatar Petroleum registered to take part in the first United Nations Clean Development Mechanism (CDM) project under the Kyoto protocol in the Gulf region (CDM, 2007).

Qatar Development Bank played a vital role in introducing and implementing a sustainable financial model within the country which remains a role model for other OIC countries as well as to the whole world. It worked with Qatar Charity by providing financial guarantees for investors. Third-party guarantees help attract funding from Islamic banks such that the compassionate Islamic finance contracts are used to help build businesses and support small enterprises that practice circular business concepts. Providing subsidy for the cost of funds through a blended Murabahah arrangement with other banks, they helped promote circular economy through financing SMEs.

Supporting market development will demand for advisory and other support services, which can be provided through various bodies like the way we have witnessed in the case of the Qatar Incubation Center, Qatar Science and Technology Park, and partnership with Qatar Development Bank. The model created by Qatar should be adopted by other nations hoping for an effective transition to circular and hence economic models. There is a huge potential to replace traditional businesses with their circular counterparts in the international market. Sustainable waste management system has significant implications for effective implementation of circular economic models. Potential entrepreneurs can export waste to other countries or launch a waste exchange mechanism where waste is traded for good and can be reused into production and thus can generate additional revenues for firms. It is time to take an interest in catalyzing private investments into developed and developing countries by funding joint feasibility and scientific inquiry in collaboration with academics, policy makers, and industry practitioners.

5. Conclusion

Driven by the SDGs and through active policy support and strategic targets, the linear economic model is transforming into the circular economy paradigm. The global financial design is changing because of the responses of businesses to the various initiatives taken by the UN and other international bodies. The ways of doing business are also changing, with reporting and disclosure becoming more comprehensive regarding SDGs and other contemporary concerns. However, the linear economy paradigm is still catered by some of the global best practice standards such as Basel III, financial reporting standards, etc. This important gap has been identified by many studies and policy makers and regulators are called to amend important principles and standards in the light of the new but rapidly changing realities. This call is equally relevant for IFSB and AAOIFI standards. The transformative global scene provides an excellent opportunity for researchers and environmental analysts to undertake more work with the objective of contributing towards the transition to a circular economy to become more responsible, and resilient as well as to ensure collective affluence and wellbeing.

The issue of risk and the unfavorable risk/revenues profile of circular economy projects dominates the financing need of the projects. It seems to be counterintuitive that the approach that preserves the economic value of materials and products faces the problem of revenue generation and uncertainties, resulting in a high financial and financing risk which can be overcome by innovative financing instruments such as Green Sukuk. Funding bodies such as banks and investors are aware that circular economy projects are not necessarily inherently riskier than linear projects, especially from the long-term perspective. But it is rather that the regulatory system, markets and financial risk assessment are distorted and biased in favor of the financing of linear projects thus making it difficult for them to finance circular economy projects. It should be a wholehearted effort from financiers, regulators, and policy makers to push for the long-term value creation and longevity of circular business projects which will help the circular economy to become the main priority in the sustainability domain. All global stakeholders need to understand that the development of the circular economy is not only beneficial to the effective protection of the ecology and the sustainable exploitation of the resource but also to long term survival of the world and of humanity.

To overcome the financing challenges of circular businesses, there should be a collaborative effort amongst central authorities, local governments, financial institutions, and enterprises towards the establishment of a sustainable financing mechanism. To provide the needful financing for circular businesses, governments have a key role to play in strengthening

domestic policy frameworks, better aligning and reforming policies across the regulatory spectrum to overcome barriers to circular economy investment, and providing an enabling environment such as green financing and Green Sukuk options that can attract both domestic and international investments.

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