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Evaluating and monitoring circularity

*Jurij Giacomelli, Damjan Kozamernik and Polona Lah**

Business models based on circularity principles aim at avoiding negative effects of the common extractive industrial model by replacing it by a restorative or a regenerative model of production. Therefore, in line with its mandate, SID Banka endeavours to incorporate its support of circularity into its basic strategic goals, with the aim of boosting firms' competitiveness, fostering sustainable growth and generating new jobs. This article presents SID Banka's experience in the development and implementation of a scoring model designed to evaluate and monitor firms' potential and capability to adopt circular economy principles. The purpose of the model is thus to identify and quantify a firm's business model's aspects of circularity and to evaluate its circular potentials, capabilities and risks. Furthermore, the model enables the Bank to upgrade its pricing policy in targeted segments of its activity by linking it to the elements of a firm's circularity and therefore to provide additional incentives for circular transformation at the firm's level. It also enables systematic monitoring of the implementation of circular transformation in a firm over time.

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SID Circularity Assessment - A scoring model for the evaluation and monitoring of firms' potential and capability to adopt circular economy principles

I. Introduction

The promotion of circular business models requires a different approach toward the evaluation and identification of firms with circular potential. It also requires a proper capability to quantitatively assess the extent of circularity content of the business model of a given firm. SID Banka and Giacomelli Media (Gm) therefore joined forces to develop a model for the evaluation of circular economy principles at firms' level, in short, "**The Circularity Assessment Model**". The result is a pilot framework, currently tested within SID Banka and considered to be introduced into the regular practice of SID Banka and will be used in the process of clients' assessments and the evaluation of its mandate.

The basic purpose of the Circularity Assessment Model is to identify firms with **circular potential** and to evaluate this potential from the standpoint of their **target business model**. By understanding both **the potential and capability to transit from linear to circular models**, the bank can deepen the understanding of the circular transformation of its clients, define the most effective forms of financing and design the most suitable way of monitoring the implementation of the circular transformation process.

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All this is to enable the bank to better understand its customers from all relevant business aspects of the circular transition systematically monitor their progress in the area of circular transformation and manage the client portfolio, particularly of innovative SMEs that face the circularity-related challenges. In that respect SID Banka closely follows some early good practices in the international financial environment, such as those of ABN Amro, ING Bank, Rabobank and Intesa Sanpaolo and successfully implements its own innovative approach in Slovenia.

II. Challenges of circular transition and peculiarities of corporate transformations of circular business models

In order to fully grasp the usefulness of the Circularity Assessment Model, we should first understand the meaning of the circular economy and the challenges of the multi-level circular transition. This enables us to dive into the peculiarities of circular business model transformation and the role of financial intermediaries in this engaging, all-present and long-range process towards the circular economy, as defined for example by Ellen MacArthur Foundation[1]:
"Looking beyond the current "take, make and dispose" extractive industrial model, the circular economy is restorative and regenerative by design. Relying on system-wide innovation, it aims to redefine products and services to design waste out, while minimising negative impacts. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural and social capital."

II.1 Challenges for the economic growth arising from circularity issues

The concept of the circular economy is the result of the evolution of the economic analysis over the past 40 years, which stems from the findings and objectives of sustainable development and the search for answers on how to ensure the supply of primary and secondary material resources and energy sources in a way that will allow for the continuity of social development while simultaneously renewing stocks of primary resources and the preservation and respect of the natural and social environment.
It brings **a new development paradigm**, which departs from a traditional, linear economic model in which the acquisition of primary resources is followed by their processing, consumption and ends in waste as the final result of the consumption phase.
According to the United Nations, the rapidly growing use of materials is largely the result of rising consumption of the middle class, which is growing at a global level. The societal progress has inevitably brought about negative effects in a form of rising environmental pressures. It is clear that with such a development model, the Earth will not be able to provide enough resources for all people who want, or will only want to enjoy the same standard of living as we know it in so-called developed world.
Thus, the circular economy as a new economic model is based on the participation of all actors involved in interconnected value chains. It focuses on resource management in such a way to keep them in the production and consumption cycle for as long as possible, taking into account the economic, environmental and social dimensions and incorporating both technological and social innovations. All this requires a thorough transformation of supply, production, resource allocation, as well as product and service consumption. The shift to the new paradigm results in the systemic revaluation of natural resources, the transformation of primary and secondary resources markets as well as markets of investment and consumer goods, accompanied by the simultaneous transformation of the markets of human resources and competencies on a global scale.
In this context, new technologies and socio-economic phenomena such as the sharing economy and digitisation take on important roles of "facilitators" of change.
The concept of circularity begins with the product and service design. We should rethink how we shape them so that they can be maintained, reused, repaired and, finally processed and reused in the next value chain.
The circular economy reflects the changed preferences and new habits of consumers, brings new principles and approaches to the regulation and management of markets and competition, and enables the development of new activities and jobs, while reducing the consumption of primary resources and effects on the environment in general.
The challenge for a successful **circular transition** at the global level is to implement a comprehensive global reform process of the redesign of a legal and regulatory framework that will enable and promote the implementation of good circular management practices and reward them in a way that will increase economic competitiveness and

[1] The definition of the circular economy: https://www.ellenmacarthurfoundation.org/circular-economy .

[2] Decoupling Natural Resource Use and Environmental Impacts from Economic Growth, UNEP International Resource Panel Report, 2011

social cohesion. Such a reformistic journey of checks and balances should **encourage and facilitate cooperation between all stakeholders in the circular transition**: public institutions and decision-makers, research and development institutes, the corporate sector, educational and culture and art institutes and movements and, certainly, citizens, households and consumers. A wide participation is needed to facilitate and promote circular innovation required to transform new technologies and knowledge into competitive forms of supply and processes in economic change.

At the global level this process of circular transition increases the ability of decoupling of the use of natural resources from the economic growth and welfare. **Decoupling**[2] means the ability of the economy to grow without a proportional increase in energy and resource consumption (taking into account resource constraints) and pressuring the environment by taking into account the limits of sinks. In other terms, the economy that grows and develops in a decoupled way, should not have any negative effects on soil fertility or biodiversity and would not reduce the supply of natural resources, pollute or even poison soil, water and air. The concept of decoupling[3] has been discussed ever since the publication of The Limits of Growth by the Club of Rome in 1972[4].

II.2 Sustainability and circularity

The concept of Sustainable Development, emphasised by the homonymous Agenda 2030 adopted at the Summit in Rio de Janeiro in 2015, represents the historic agreement of the international community to eradicate poverty, reduce inequalities, ensure progress, and protect the environment for present and future generations. The Agenda 2030 for Sustainable Development combines in a balanced way three dimensions of sustainable development - economic, social and environmental - and intertwines them through 17 sustainable development goals that need to be realized by 2030. An important feature of the new agenda is universality: taking into account national circumstances, its goals will be pursued by all countries of the world, both developing countries and developed countries.

A wider concept of the respect for human rights and gender equality, and ensuring the prosperity, peace and security for all people and communities came to the forefront of the new development agenda and in many ways represents the bedrock for the circular transition. In the corporate sector it is reflected in the corporate social responsibility and sustainability reporting practices.

Here we expose two emphases. First, **the objectives of sustainable development have a much wider social basis**. **However, it does not take into account environmental constraints as absolute.** The scarcity of natural resources is not explicitly considered as absolute limitation within which it is only possible to plot the absolute limits of social development in terms of the accepted universal social values and the criteria of quality and dignity of the life of the inhabitants of the planet. The objectives of sustainable development, together with the United Nations Agenda for Sustainable Development by 2030 and the Paris Climate Agreement (United Nations Framework Convention on Climate Change), are the foundations of **an emerging global system of sustainable governance**.

The European Commission presented the first package of measures for the transition to the circular economy in 2014 and finally adopted it together with the December 2015 Action Plan. Since then, it has been followed up by the Commission's next move to the circular economy.

The most advanced EU countries, including, in particular, the Netherlands, Finland, Denmark, and soon after them, France, Germany, Italy and Slovenia, are steering the transition to the circular economy through a wide public dialogue and engagement process tacked by orientation documents, such as positioning papers or "roadmaps" and national strategies. With its own "Roadmap towards the circular economy in Slovenia" (2018), the country emerges as one of the European frontrunners in this process[5].

[3] During the Japanese G7 Presidency in 2016, the UN International Resource Panel (UN IRP) highlighted the challenge of decoupling growth from resource use in its report at the Tokyo Summit. The IRP estimates that resource consumption increased eight times between 1900 and 2005, twice as high as the population growth rate, but slightly less than the real growth of world GDP in the same period, which jumped at least 19 times in the 20th century. Although this data indicates a relative success of decoupling, they do not take into account the absolute lack of material resources. After 2000, the trend began to turn around, which the IRP explains with the global transition of production from substantially more productive countries to those with lower material productivity. Hence, more developed countries were able to increase their material productivity also due to the changed economic structure in which services are dominant. At the global level this does not improve material productivity.

[4] The Circular Economy and Benefits for Society Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency; A study pertaining to the Czech Republic and Poland; Authors: Anders Wijkman and Kristian Skånberg; Modelling: Kristian Skånberg and Mårten Berglund; A study report at the request of the Club of Rome with support from the MAVA Foundation, 2017

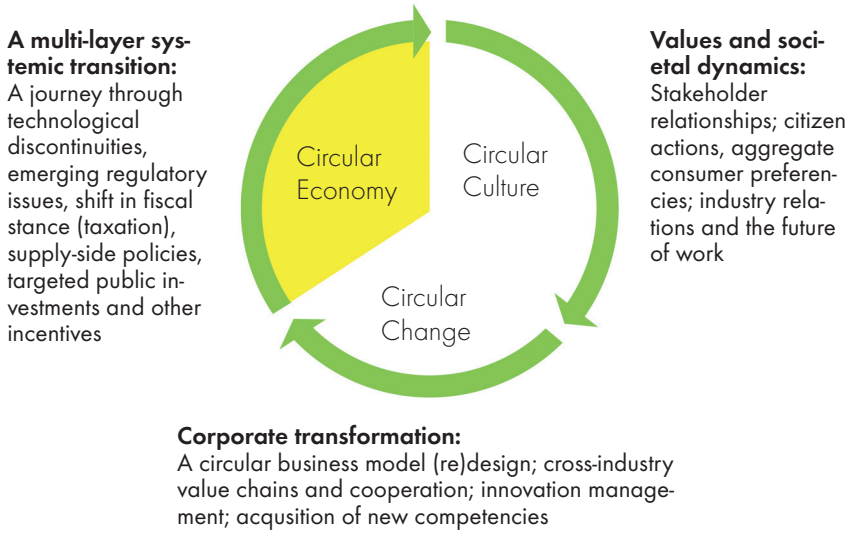
II.3 Challenges of corporate transformations related to the transition towards the circular economy[6]

Transitioning towards the circular economy requires a **system-level transformation** at local, national and international levels. No single government, organisation or business can accomplish this change alone. Public and private sector stakeholders must work together towards a common "circular" vision in order to transform production, manufacturing and consumption systems and patterns through a process of joint and continuous experimentation, learning, adaptation and scaling of efforts. This complex transitioning process, depicted in Illustration 1, sets transformational challenges to very different organisations: governments, municipalities and other public authorities and regulators; large corporations and small- and medium-sized companies; financial institutions such as banks or insurance companies; social enterprises and non-governmental bodies; institutions of public or private education and scientific research centres and institutes; health organisations; and religious institutions.

The circular transition, however, confronts us all: as humans, as individuals and family members, and as contributors, decision-makers and consumers in different contexts. We are all challenged to re-assess our values and preferences in terms of our choices related to our own personal development: as consumers; as members of families or households; as professionals contributing to the success of the organisations in which we work; as citizens, voters and taxpayers; and finally, as creative and critical members of civil society, contributing to any form of its constant and unpredictable dynamics. These challenges create a context of **cultural change**. Indeed, the circular transition, as a shift in the economic and social system, embraces all these aspects, and opens a whole new field of exploration of transformational leadership in each and every one of us.

At the level of single organisations, **circular change assumes the nature of a corporate transformation** towards innovative and more sustainable circular business models. This transition takes place at the micro-level: in organisations and productive units, that is, in enterprises. A business model transformation towards circular principles *en masse* sets large and small companies, even entire industries, on the path of challenging journeys of exploration, experimentation and continuous learning. In order to succeed, companies need to dig deeply into their purpose and must equip themselves with specific competencies before their departure. On the way they must undertake a multi-stakeholder approach of **collaboration and experimentation**. Mastering these prerequisites for circular innovation

Illustration 1: The Circular Triangle representing the three fundamental aspects of the circular transition



Source: "Introducing the circular triangle". (Giacomelli Jurij, Ladeja Godina Košir: Introducing the circular triangle; Gm, 2017; The Circular Triangle Concept and Scheme are intellectual property of Circular Change and Gm.

[5] Slovenia, like other more advanced EU Member States developed its own document of strategic orientation, titled: "Roadmap Towards the Circular Economy in Slovenia", and already has a wider framework for the transition to the circular economy, defined in particular in the following documents and activities of the Government of the Republic of Slovenia, its ministries and competent services, among them:

- Vision of Slovenia 2050 and Slovenia's Development Strategy 2030;
- Linked to growth - Slovenia's transition to the green economy, the umbrella document of the Partnership for Green Economy, which operates within the Cabinet of the Prime Minister of the Republic of Slovenia;
- Framework Program for the Transition to the Green Economy - OPZG with the Action Plan for the Implementation of the OPCG (ANi OPZG) and the Plan of Activities of the Ministries and Government Departments (NAMVS) 2015-2016;
- Waste Management Program and Waste Prevention Program of the Republic of Slovenia;
- Smart Specialization Strategy - S4, which represents the fundamental basis for 12 Strategic Development Innovation Partnerships in Slovenia, one of which is focused on the area of the circular economy (SRIP - Networks for the transition to a circular economy).

[6] This chapter refers to the underlying article: "Introducing the circular triangle". (Jurij Giacomelli, Ladeja Godina Košir: Introducing the circular triangle; Gm, 2017; Link: http://mediachange.info/Circular_Economy/Introducing_the_circular_triangle ; and: http://www.circularchange.com/introducing-circular-triangle/)

will distinguish future leaders from followers.
Corporate circular transformation inevitably interacts with the needs and preferences of consumers: individuals and households. Furthermore, it is tied to the values and capabilities of the employees in the organisations and in the organisations up- and downstream in the newly composed value chains.

II.4 The role of financial intermediaries in supporting the circular transition

Financial institutions support the economy by providing funding for economic activities and ultimately jobs and growth. Investment decisions are typically based on several factors, but those related to environmental and social considerations are often not sufficiently taken into account. If financial institutions learn how to successfully manage financial risks stemming from climate change, resource depletion and environmental degradation and if transparency of their clients' activity is assured, it is likely to expect reorientation of capital flows towards sustainable investment and long-termism in its financial activity. These priorities are also set in European Commission's Action Plan on Financing Sustainable Growth, delivered in March 2018.
From the point of view of the financial intermediary, what are the consequences of circular transformations for the financial markets and in which way; in particular, banks can finance the transition to a circular economy? The financial system can successfully perform its transformational function, if banks are prudent in lending and successfully evaluate and manage risks. Risk evaluation takes into account two factors: the borrower's capacity to repay credit and the value of collateral, by means of which he can additionally secure the loan borrowing. This leads to a need for thorough verification of the borrower's creditworthiness and the valuation of guarantees. However, in the context of circularity we lack relevant comparisons and reference points. Challenges in this area can be divided into three groups.
Understanding innovation: it is about valuing the potential of circular business models and the ability and commitment of the responsible teams and individuals for their realisation. This is a demanding task that requires substantial specific knowledge and it is exposed to the unpredictability of performance and the lack of appropriate comparisons.
Understanding linear and circular risks is the next challenge, which may lead to a bias. Namely, the implementation of circular business models is certainly exposed to specific **circular risks**. However, one should not overlook the fact that companies pursuing conventional business models neglect the challenges related to circular transition and are therefore exposed to **linear risks**.
In **Exhibit 1** we provide an overview of the main aspects of circular risks as opposed to linear risks.
Understanding the financing needs of circular models is the third challenge. Not every feasible circular business model is truly suitable, for example, to be financed by a long-term debt. The degree of maturity has a significant impact on what type of financing corresponds to the risk profile.

Exhibit 1: Circular risks and linear risks

Circular risk	Linear risk
Shift of mind-set needed to see (used) products as valuable sets of modules and/or materials instead of waste.	Dependency on virgin resources (risk of supply chain disruption).
Required initial investment can cause deterioration in short-term margins.	Exposure to resource price volatility.
Balance of short-term margin versus long-term stability.	Increasing environmental legislation.
Market demand for the offered products: customers and companies are currently used to owning products.	Growing population and increasing financial wealth.
Dependency on supply chain collaboration.	Effects of climate change.
Unknown residual value of many products, due to small market of circular output companies (i.e. companies that upcycle, re-use, remanufacture or refurbish).	Demand for environmentally sound products.
Supply chain lock-in risk.	Businesses/products that become obsolete by holding onto old linear business practices (stranded assets).

Source: Money makes the world go round (and will it help to make the economy circular as well?); Working Group FINANCE, March 2016, The Netherlands, available through Ellen MacArthur Foundation: https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/FinanCE.pdf, page 74.

II.5 Circularity challenges and the role of SID Banka in Slovenia

In line with its mandate as a national development bank, SID Banka supports the access to high quality financing with the aim of boosting firms' competitiveness, fostering sustainable growth and generating

new jobs. SID Banka focusses its activity on the financing segments where market gaps are the most apparent, yielding as high as possible multiplicative effects form SID Banka's financing activity.[7] In providing financing SID Banka acts in support of sustainable policy of the Republic of Slovenia and the European Union, while applying the principles of complementarity, subsidiarity, non-crowding-out and non-discrimination.
Its non-distortionary role in providing finance to firms is further ensured by the full compliance of state aid regulations issued at the EU level, which stipulate in particular the maximal state aid intensity development banks can apply in particular segments of financing.
It is important to understand that development banks indeed deliver state aid to companies whenever they apply interest rates that are below the market rate. The extent of the maximal deviation to the market rates is predetermined by the EU regulations and in practice monitored by national and EU authorities, to whom all implemented state aid schemes must be reported. Finally, the investment and pricing policy of EU development banks must itself be financially sustainable over the longer run, since any financial support from a development bank is eventually a state aid case in a same way as a financial support to a private institution.
Since 2010, SID Banka has been one of the frontrunners in Slovenia in engaging in a broad set of activities in support to its commitment to circular economy. Fostering circular change, whenever possible, is one of the basic orientations for targeted implementation of SID Banka's financial programmes and product design. For example, SID Banka is financing programmes for research, development and innovations which are well suited also for projects of circular change. Its programmes in support of investment enable to stimulate projects in waste management, recycling, re-use, product durability and modularity, energy efficiency, etc. Sustainable finance in practice is about two imperatives: financing for sustainable and inclusive long-term growth and strengthening financial stability by incorporating environmental, social and governance factors into the investment decisions. These non-profit factors, or externalities, can be taken into account, or internalised, in the decision-making of public policy entities such as development banks. Conversely, these factors as well as environmental and climate risk most often had not been, and often cannot be, adequately addressed by the commercial financial sector[8], which are primarily interested in the direct profit of a particular project they finance.
Rather than designing a specific product for a targeted support to a circular economy, SID Banka plans to support the circular transition in all its financial products, by favouring circularity in its lending decision and eventually in its pricing policy. This calls for the adoption of a more holistic approach to evaluation of a firm's performance regarding its social, sustainable development and environmental impacts. There is, however, still a major lack of broadly-accepted and transparent market standards to assess companies' sustainability performance.
SID Banka has therefore progressively developed its own approach to assess the non-profit aspects of the potential project to finance in relation to **a 5-scorecard framework**: financial soundness scorecard, raw material scorecard, environmental scorecard, energy scorecard and innovation scorecard. This rather qualitative approach enabled to identify strengths and weaknesses of the project or the firm's business model with respect of the main externality cases. Care is taken, of course, that the financial soundness scorecard contains information on the long-term sustainability of the firm's business model, complementary to the information from financial indicators that are embodied in the standard credit rating evaluation.
The next step for SID Banka is upgrading its 5-scorecard framework by incorporating circular criteria and making it more quantitative in its implementation. The evaluation of the circularity elements indeed naturally belongs to the spirit of the SID Banka's 5-scorecard framework. Next sections present the prototype of the circularity evaluation tool, developed by SID Banka and Gm.

III. The Circularity Evaluation

III.1 The tool: Circularity Assessment Model

The model of circularity evaluation is experience-based and is applied by the use of a comprehensive questionnaire. It contains mainly qualitative assessment of a number of aspects of a target business model and capabilities for the circular transformation of an observed firm.
First, we approach the evaluation of the **circular potential** of a client by understanding the typology and characteristics of the **target business model.** We therefore introduce five generic business models[9] (circular procurement, product life-cycle extensions, sharing platforms, product as a service and resource regeneration),

[7] See Geršak and Gorišek (2018) for an example of financing market gaps evaluation in Slovenia.

[8] Financing a sustainable European Economy, Final Report, by the High-Level Expert Group on Sustainable Finance, Secretariat provided by the European Commission, 2018

Exhibit 2: Circular business models distinguished by financing needs and risk profiles

Circular Innovation Models (CIM)	Circular Use Models (CUM)	Circular Output Models (COM)
Product design: Provides products that are designed to make them long and useful life and/ or be easy to maintain, repair, upgrade, refurbish or remanufacture. **Process design:** Develops processes that increase the reuse potential and recyclability of industrial and other products, by-products and waste streams. **Circular Supplies:** Provides input materials such as renewable energy, bio-based, less resource-intensive or fully recyclable materials.	**Product as a Service:** Delivers product performance rather than the product itself through a combination of product and services. Ownership of the product is retained by the service provider. Primary revenue stream from payments for performance delivered. **Sell and Buy-back:** Sells a product on the basis that it will be purchased back after a period of time. **Sharing Platforms (Access Provider):** Enables an increased utilization rate of products by enabling or offering shared use/access/ownership. **Lifetime Extension:** Extends the useful life of products and components through repair, maintenance, or upgrade. Tracing facility: Providing services to facilitate the tracing, the marketing and trade of secondary raw materials.	**Recaptured material supplier:** Sells recaptured materials and components to be used instead of virgin or recycled material. Refurbish & Maintain: Refurbishes and maintains used products in order to sell them. **Recycling facility:** Transforms waste into raw materials. Additional revenue can be created through pioneering work in recycling technology. **Recovery provider:** Provides take-back systems and collection service to recover useful resources from disposed products or by-products **Support lifecycle:** Sells consumables, spare parts and add-ons to support the life cycle of long-lasting products.

Source: Money makes the world go round (and will it help to make the economy circular as well?); Working Group FINANCE, March 2016, The Netherlands, available through Ellen MacArthur Foundation: https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/FinanCE.pdf, page 44;

which help us identify the differences between **three distinguished profiles** of these, differing on which phase of the value chain they are mainly concerned. We take into account different nature of risks in each of the three basic profiles, which define different needs for financing for their successful operation.

Then we introduce the aspect of **capability and commitment to the circular transformation**, evaluated primarily in terms of the company's competences across the organisation, the actual allocation of the companies human and organisational resources and time to the implementation of the transformation of the business model into circular and the commitment by the management for the implementation of the circular transformation, demonstrated through the actual business objectives, strategies, monitoring and - leadership exercised throughout the organisation to accomplish the circular potential to its maximum extent.

The evaluation is based on a questionnaire to which we assign a scoring model, balanced by the appropriate factors or weights, so that all aspects are taken into account to a maximum extent.

Each circularity evaluation is carried out in several steps. Collected and elaborated information from the client enable us to systematically monitor the implementation of the circular transformation in regular intervals.

In the first step we arrive at a Quick assessment of the circular potential by filling in **the short questionnaire**, which contains 12 questions, to detect the circular potential (see **Exhibit 4**).

If the score is sufficient and circular potential is actually there, we proceed to the next step.

Step 1: Description of the target business model and "Quick Assessment" of the circular potential

Since the target business model of the observed company is at the core of the valuation, we describe it first by using a simple questionnaire related to the **Business model canvas** and define **its profile (CIM, CUM or COM)**seen as being relevant from financing aspects.

An expert working group gathered at Ellen MacArthur Foundation presents three generic types of business models from a financing aspect in **Exhibit 2**.

Step 2: Evaluation the level of circular orientation

Then we approach the full questionnaire. First, we assess **the level of circular orientation** and its nature. The circular potential is evaluated by stages of the value chain of the target business model. This enables us to better understand the risks to which the company is exposed and how

[9] Lacy, Peter, Rutqvist, Jakob: Waste to Wealth: Creating Advantage in a Circular Economy; Palgrave MacMIllan, 2015.

Illustration 2: Five generic circular business models related to the value chain and the three types of risk-profile models

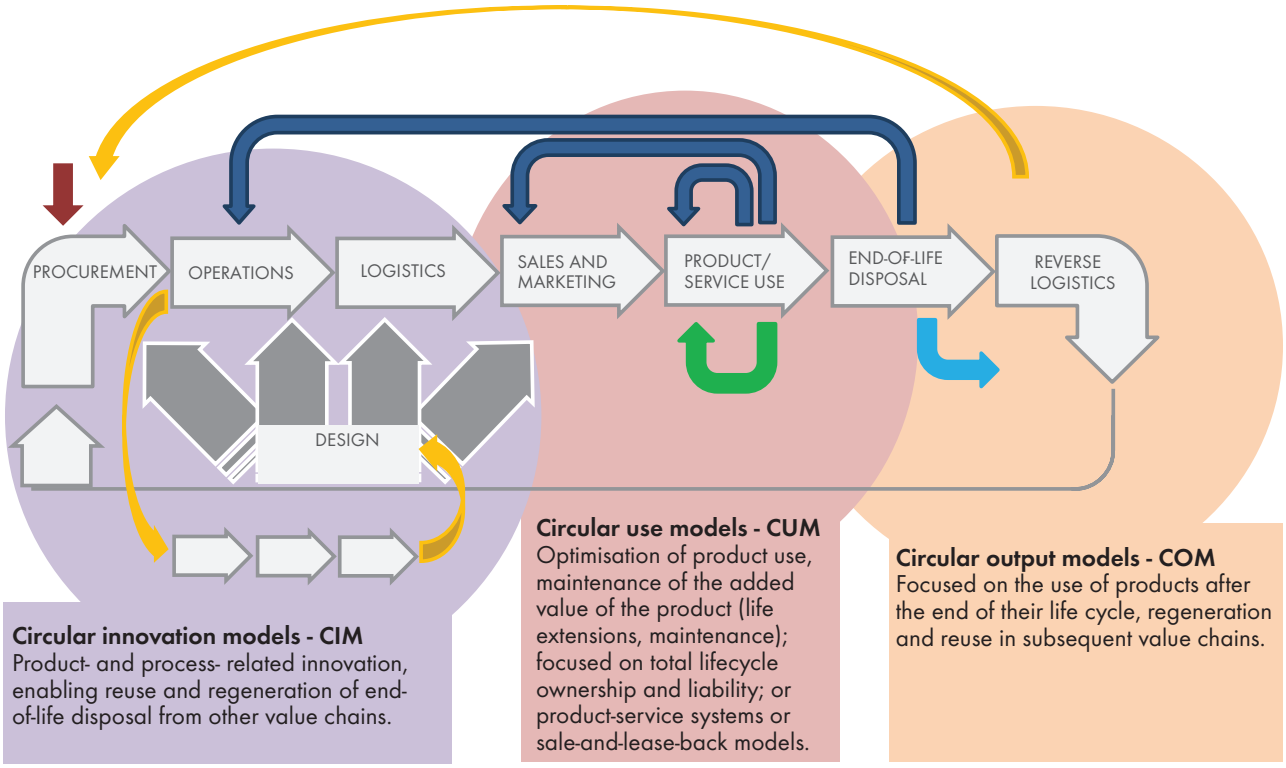


Exhibit 3: The scheme of Circularity assessment model

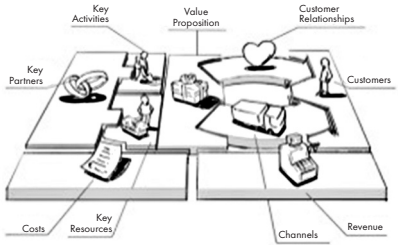
<table>
<tr><th colspan="2">CIRCULARITY POTENTIAL

ASSESSMENT OF THE CIRCULAR POTENTIAL OF THE TARGET BUSINESS MODEL</th><th colspan="2">CIRCULARITY COMMITMENT

ASSESSMENT OF FIRM'S CAPABILITY AND COMMITMENT TOWARDS THE CIRCULAR TRANSFORMATION</th></tr>
<tr><td colspan="4">1. Target business model description and Quick Assessment

Synthetic target business model description serves to the understanding of the business logic and its dynamics towards the circular transformation Quick assessment - 12 questions, 24 points, helps indicate the circular potential and commitment.

Following the description of the business model by using the specific, circularity-related questions deriving from the Business model canvas we define the type of the business model: CIM, CUM or COM

  </td></tr>
<tr><td>2. x) Assessment of the circular potential

Step 1. Scoring of the target business model along the phases of the value chain (SCORING)

Step 2: Exposure towards linear and circular risks (factor x)</td><td>0 - 100

0,80< SCORE <1,20</td><td>2. y) Assessment of the circular commitment

Step 1: Scoring of available organisational competencies and commitment

Step 2: Intensity of investments (allocation of resources) into the circular transformation (factor y)</td><td>0 - 80

1,00< SCORE <1,20</td></tr>
<tr><td>Result 1: Profile of circular potential, related to the type of the circular business model which depends on its impact on the value chain</td><td></td><td>Result 2: Circular assessment matrix</td><td></td></tr>
</table>

risky it is. We examine whether the target model is circular, what aspects of circularity along the firm's value chain and what are target model characteristics in terms of funding.

Step 3: Evaluating the ability of the customer to make circular transformation

Finally, we evaluate the commitment to the circular transformation. We examine whether the firm really embraced the path of change. Sometimes the firm may have an excellent starting point for the transformation in terms of its potential business model but falls short of the ability to transform itself. That depends on two basic components: the competences for increasing the circular orientation and the actual commitment to this goal. In short, we are wondering whether the firm has the **ability** to do this and whether it actually is engaged with the change: **the commitment to change**.

How do we arrive at a total score for the selected company? First, we evaluate each dimension individually through steps 2 and 3 and give the company a score consisting of two parts. Then we sum up the assigned points into a final score and show both together in the two-dimensional graph, which allows further comparisons against predetermined standards or within a portfolio of the bank's clients.

III.3 Structure of the assessment model and "Quick assessment" questionnaire

In this section we demonstrate, first, the scheme representing the value chain and the three types of circular business models, as defined from the aspect of financing needs and risk profiles. Then we present an exhibit of the overall Circularity Assessment scoring model (Exhibit 3) only to come to the questionnaire of the Quick Assessment (Exhibit 4). Finally, we present also examples of typical results of the complete circularity assessment, which are presented, apart from the total score, also in a form of a Profile of the circularity assessment and the Circularity Assessment matrix (Illustration 3). In the latter one the impact of factors x and y are represented on a hypothetical example.

III.2 Testing the model: front-end story

In the testing phase employees of SID Bank were acquainted with the concept and the circularity assessment model. Next, four companies were evaluated, and the model was to a moderate extent attuned with experiences earned from these first assessments. Particular attention was paid to the smoothness and clarity of the questionnaire. Weights in the scoring system were also attuned to better reflect the represented factors of circularity potential and the firm's commitment. Additional improvements of the questionnaire are expected after further assessments.

IV. Implementation within a broader SID Banka's approach

IV.1 The circularity assessment tool in the SID Banka's firms' evaluation framework

SID Banka has currently upgraded its regular 5-scorecard framework with the inclusion of the narrow version of the Circularity Assessment model. The upgraded framework provides a systematic, non-discriminatory and rather user-friendly complement to standard credit ratings, which of course remain the main pillar of company's evaluation when decisions on financing are to be made. This framework is intended for systematic use when considering lending to firms, as it now provides additional quantitative information about how consistent a transaction is with SID banks mandate. Besides the information on the 5-scorecards, the framework currently evaluates the circularity of the firm's business model in both, its capacity for circular change and the actual evaluation of circularity performance.

The wider part of the circularity assessment tool has not yet been systematically implemented into SID Banka's framework and it is left only for cases with high circular potential, where refinement of results can provide useful information to the lending decision.

More concretely, SID Banka's 5-scorecard framework is designed as a questionnaire with currently 53 questions in total and 140 predefined answers. Each of the 53 questions relate to one of the five already outlined scorecards. All questions have predefined answers with a corresponding positive or negative numerical score respectively, describing how much the business model of the firm can be valued against examined sustainable development issues. The framework also predefines the importance of each question by setting different weights so that the overall performance of the business model can be quantified and decomposed across all five scorecards and its circularity.

The questions from the Circularity Assessment model are integrated in the scorecards according to their content fit. A synthesis of the resulting framework is best represented in Exhibit 5.

The 5-scorecard is designed so that positive values of the assessed questionnaire reflect in a positive contribution the final score. In general, each firm's activity with a positive societal or environmental externality contributes positively to the final score. When the firm's activity does not coincide

Exhibit 4: Quick circularity assessment questionnaire

	No.		Questions
Circular commitment - Capabilities for circular transformation	1	DEGREE OF PLANNING OF CIRCULAR TRANSFORMATION	Is there a plan for integrating circular principles (modularity, reproducibility and degradability, reducing the size of the product) into the company's business model?
	2	ACCOUNTABILITY AND SYSTEMATIC APPROACH	Are there concrete commitments and responsibilities related to the circular economy that are positioned in the organisation and are planned and regularly reported?
	3	ORGANISATIONAL CAPABILITY FOR COLLABORATION	Does the company cooperate with research or advisory organizations in the field of circular transformation, is active in industry and other business associations, and actively cooperates with companies up and down the value chain?
	4	TECHNOLOGICAL CAPABILITY FOR CIRCULAR TRANSFORMATION	Does the technology that supports the basic business model allow the operations model to be adapted in the direction of circular principles (modularity, reproducibility and degradability, reducing the size of the product)?
	5	OBSTACLES	Are identified obstacles (legal, regulatory, market ...) along the transformation towards a circular business model low or none?
Circularity potential of the target business model	6	LEVEL OF CIRCULAR AXCTIVITIES	Are there ongoing activities to implement a circular business model in the form of already implemented investments or investments in implementation that match circular principles?
	7	MODULARITY OF PRODUCTS AND SERVICES	Does the company develop / design products according to circular principles (modularity, reproducibility and degradability, reducing the size of the product)?
	8	USE OF SECONDARY RESOURCES	Does the company acquire material inputs from secondary sources in a significant proportion of total purchases?
	9	SELECTION OF SUPLLIERS	Does the company take into account circular principles in selecting suppliers and determining the conditions for suppliers?
	10	SUSTAINABLE ENERGY USE	To what extent does the company exploit sustainable energy sources in terms of the volume of total purchases (value of energy products)?
	11	PRODUCT RE-USE AND LIFE EXTENSIONS	Does the company provide incentives, services or infrastructure for the secondary use or reuse of its product (or physical components of their services) or extension of service life?
	12	REVERSE LOGISTICS	Does the company ensure the use of material from residual material (disposal) and logistics services and infrastructure for reverse logistics?
			Total

with positive broader effects, the firm will be evaluated negatively. The final score of the assessment can therefore range from a negative minimum to a positive maximum. By upgrading the framework's circularity dimension, additional importance was put on the raw material balance scorecard and other criteria of circularity. The firm's circularity is defined as *firm's potential for circular transition*, which also takes into account available technologies, market and legislative barriers and management capacity and as *firm's*

Illustration 3: Circularity assessment matrix representing a hypothetical example

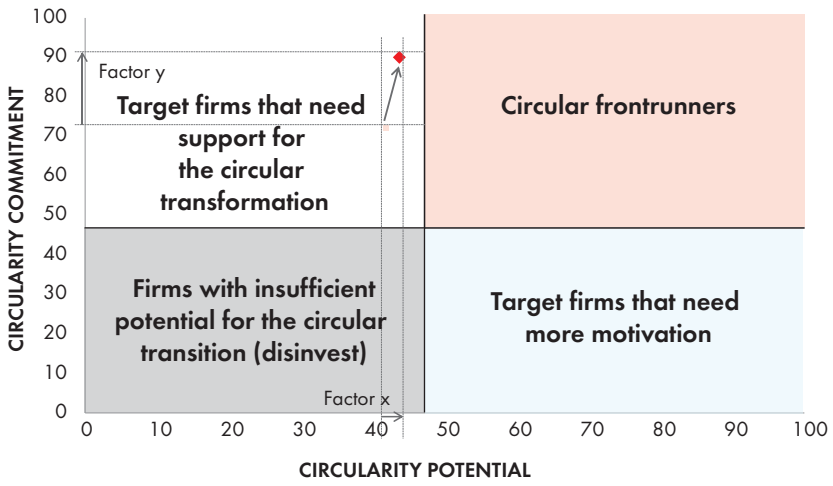


Exhibit 5: A synthetic representation of the 5-scorecard framework

I) Financial balance scorecard - long-term business model resilience
12 questions on the long-term sustainability of the firm's business model, the soundness of its organisation and possible threats to future business performance. It considers aspects of firm's competitiveness and resilience to shocks, its market position and possible managerial or social issues.
Five questions from the circularity evaluation tool: four on circular potential, involving the firm's planning to integrate circularity principles in its products, management commitment to circular transition, monitoring and identification of barriers to circularity. One question is related to the firm's circular performance, related to already realised investments related to circular transformation.

II) Raw materials scorecard
Two questions on the company's utilisation of raw materials.
Five questions from the circularity evaluation, all related to firm's circular performance: selection of suppliers, selection of raw materials used in production, dealing with waste, and dealing with recycling and reutilisation of firms' products.

III) Environmental scorecard
Eight questions on the firm's environmental and social responsibility. No question from the circularity evaluation tool.

IV) Energy scorecard
11 questions on the firm's energy efficiency and use of renewable energy sources. One question from the circularity evaluation tool on firm's utilisation of renewable energy sources.

V) Innovation scorecard
Eight questions on the firm's success in knowledge transfer, its technological achievements and its innovative potential, including fostering its human capital stock.
One question from the circularity evaluation is on circular potential and refers to the possibility to use available technological processes in the firm's production according to the principles of circularity.

Source: SID Banka

circularity performance, where a current level of circular orientation is identified through the actions the firm has actually undertaken on its path to its circular transition.

IV.2 The use of the framework in the SID Banka's financing decisions

The 5-scorecard framework upgraded with the circularity assessment is certainly **a useful tool that supports SID Banka's lending decisions.** The upgraded framework more comprehensively addresses the societal and environmental externalities quantitatively, and consequently enables to establish appropriate rankings and priorities among firms and projects to finance. Being potentially a significant improvement upon its predecessor, as a more qualitative and less formal version, it makes it natural for SID Banka to use the framework systematically in deciding about lending to firms, as a complement to the standard internal rating evaluation of these firms. Internal rating evaluation that has a long tradition within the SID Banka has already to some extent taken into account business model sustainability. In that respect the design of the 5-scorecard framework has to contribute additional and complementary information on firms' circular potential beyond standard rating evaluation.
Furthermore, such design of the scoring model makes it possible to use the framework as **a complementary tool in the SID Banka's pricing policy**. Its quantitative design is well suited for the implementation of positive and negative effects on the price of a particular transaction. Since care has been taken that the information content embodied in the framework is independent of the credit rating exercise, the effect on prices can be understood that the SID Banka's endeavour to internalize societal and environmental externalities. An appropriate application of an evaluation accordingly to the presented framework thus helps the bank to rigorously stick to its mandate.
A systematic use of the evaluation framework in the pricing policy requires a clear specification of how the scores resulting from the application of the framework translate into prices, i.e. interest rates in the context of a loan. More experience is needed from the application of the evaluation framework presented in the note before it can be systematically applied to affect prices. However, rough lines about how the price effects could be specified have already been rather clear.
The price effects must aim at internalising positive or negative externalities from the company's activities, while the financial sustainability of the development bank remains intact. That entails, first, that price effects can only be considered in the form of a bonus-malus policy. Second, the maximal decrease in the interest rate must still ensure an *ex ante* positive net present value of the transaction. Therefore, it cannot exceed the income margin included in the interest rate, which is in general a rather narrow category in case of a development bank.[4] Third, it makes sense for a development bank to make asymmetric effect on the interest rate, so that negative scores raise the interest rate more than the positive scores decrease it. Such asymmetry will be even more discriminatory against firms with business models that are less in line with the mandatory objectives of a development bank. Such effect on prices ensures

a greater focus on supporting firms that have sustainable and circular business model and simultaneously reduces the risk of an unwanted systematic reduction of its revenue below the cost-recovery thresholds.

V. Further potential applications of the Circularity Assessment Model

Evaluating circularity potential and transformational capability is certainly a useful tool for a development bank in targeting its activities with respect to its mandates. Rather disappointingly, a comprehensive literature review revealed that apparently no presentation ready for use of such a framework is available. A tool for circularity assessment to be implemented at SID Banka has therefore been built basically from scratch, taking advantage of publicly available and accumulated knowledge shared by selected other banking institutions, networks and working groups.

True, a rigorous and systematic implementation of the tool is demanding in terms of time and skills of the evaluation teams, many times also for a potential client. Such tools are therefore likely to be reserved for development bank type of financial institutions. Nevertheless, as already mentioned, some international and in principle profit-oriented banks have undertaken the same journey and it will be interesting to observe whether such orientation of the corporate sector gains momentum over time and what concrete results in terms of fostering circular economy these initiatives will be able to achieve. For SID Banka, however, the application of the circularity assessment tool may offer some additional and interesting advantages.

The circularity evaluation tool could provide a useful insight in the circularity of Slovenian firms and its microstructure. After some time, a systematic implementation of the tool will not only result in a valuable dataset about the potential of Slovenian firms for circular transition, but also in their actual engagement in adopting circularity principles.

The sample of firms that are being evaluated by SID Banka within its financing activity is rather large and can therefore, after appropriate statistical analysis, provide some policy relevant insight at a macro level. In particular, it could be interesting to assess to what extent circularity may actually alleviate the problem of the scarcity of natural resources or, conversely, to what extent circularity is only reserved to some special segments or even isolated cases.

The circularity evaluation tool could also enable to examine the relationship between the circularity of firms and the sustainability of their business performance. One of commonly advanced arguments in favour of circularity is that it may improve the long-term resilience of the firms' business models. Therefore, it could be interesting to estimate the effects of the firms' circularity on its performance or default rates. If circularity turns out to be a significant factor in improving the firms' business performance, thus improving the elements usually embodied in standard credit rating analysis, it could raise the interest of commercial banks to consider financing firms with more circular business models. All the more, if circularity, or more exactly the lack of it, is identified as an important risk determinant it should be appropriately integrated in credit rating methodologies.

Finally, the circularity evaluation tool makes it possible to assess how firms perform on the path of the circular transition over time. Circular transition is a process that requires time and resources. The circularity evaluation tool can also be used for monitoring of the progress of this process over time. SID Banka will be able to observe trends in circularity from its analysis of the sample of newly evaluated firms and also form successive evaluations of firms that received long-term financing from SID Banka and are anyway subject to monitoring. Furthermore, SID Banka considers upgrading its pricing policy to support circular transition of its clients over time by committing to appropriately decrease the interest burden for firms which make significant progress in circularity. The information about the dynamics of the process may also be useful to policymakers at the state level in their effort to design the policy or improve the incentives of firms for a faster and more effective circular transition.

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