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**SPECIAL ISSUE
CLIMATE CHANGE –
RELATED RISKS AS A
FINANCIAL RISK FOR BANKS**



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Gradual and uncertain path of further recovery

*Boštjan Vasle**

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he spread of COVID-19 pandemic and related containment measures have plunged the global economy into the deepest recession since the end of the WW II this year. In the euro area, GDP decreased by a cumulative 16% in the first half of the year, with the decline in Slovenia being only slightly smaller. The downturn would have been even deeper without massive support from fiscal, monetary and other policies at national and supranational level. In monetary policy response, we have focused on increasing asset purchases and offering banks long-term funding at attractive conditions, while at the same time easing collateral standards. As part of the European banking supervision, measures have been taken to enable banks to temporarily operate below the applicable capital and liquidity buffers. These measures have also been extended to banks under Bank of Slovenia's direct supervision. Slovenian and other governments have introduced extensive sets of intervention measures that include furlough schemes, postponement of loan repayments, and state guarantees for bank loans.

After a rebound of economic activity that followed scaling back of the Coronavirus containment measures in May and June, a phase of increased uncertainty is ahead of us. Due to the second wave of infections in the region, containment measures have started to intensify again. The growth of investment and household consumption will be held back also by great uncertainty. On the positive side, growth will be encouraged by additional EU funds available from the recovery instrument "Next Generation EU", most of which is set aside for digitalisation and green growth. This time around, the economy and the banking system are also more resilient than at the beginning of the previous crisis, which should aid further recovery from recession once the pandemic is tamed.

The Slovenian banks entered the current crisis with sounder capital and liquidity positions than at the start of the 2008–2009 financial crisis. In the last decade, banks ceased highly leveraged lending to

corporates that represented one of main causes and amplifiers of the latest banking crisis in Slovenia. This has resulted in a significant decline in overall bank lending, as it was only partially offset by higher lending to households, and left the banks in search of profitable business models. Banks have, after transferring significant parts of non-performing exposures (NPEs) to the bad bank, in general further reduced the share of NPEs in their portfolios. The trend continued also in the months after the outbreak of the Covid-19 crisis, bringing the NPEs to the lowest levels and shares since the beginning of data collection (2007).

The extensive set of fiscal measures aimed at businesses and households, coupled with regulatory, micro- and macroprudential measures has so far managed to curb increase in non-performing exposures (NPEs). However, future increase in NPEs – which will intensify with the length of the crisis – is inevitable as some borrowers will not be able to withstand the ongoing crisis despite all the support from fiscal and monetary policy. Increase in impairment and provisioning costs, accompanied by a subdued credit activity, will weigh on bank profitability. Bank profits will also continue to be pressured by structural factors, present even before the crisis, such as low interest rates, competition from non-banks, and insufficient exploitation of economies of scale and scope. The banks are facing a challenging period. After huge support from the fiscal and monetary policy in the first phase of the COVID-19 crisis, they will now have to deploy their extended knowledge and links with the business sector and play an active role in coping with increasing NPEs. In addition, they will have to step up digitalisation, overhaul their business models and continue with consolidation process ongoing in the past 30 years. If we take a step back from the current situation and look from a longer-term perspective, the banking sector could also play an important role in the transition to a green economy that has become an integral part of the EU growth strategy.

* Boštjan Vasle, Governor, Banka Slovenije

The Way to the Digital and Green Transformation

*Andrej Šircelj**

Due to the outbreak of the new coronavirus, the world is currently facing one of the biggest health and economic crises. The European Union reacted to the aftermath of the epidemic with substantial resources that will help with the recovery in the Member States. The European Commission connected tackling the crisis and fighting climate change and formed a common recovery approach that is founded on the digital and green transformation of the economy and society. The goals of the recovery are people's health and welfare based on the climate-friendly and functioning economy. Hence, it is already reasonable to think in terms of reforms and investments that will contribute to the common European values and climate neutrality. Slovenia has adopted efficient measures to fight the epidemic. The measures also provide conditions for a fast economic recovery. The Slovenian banking system and economy have managed to maintain high liquidity. The financial system is stable. The Government has also put in place a project to ensure a well-organised absorption of European funds. The inclusion of all departments and their cooperation will guarantee the efficient use of the funds and implementation of new projects. I believe that the Slovenian banking system is stable and robust and that it supports economic and social development. Regarding the latter, the banking system has to consider climate change and the progression of digitalisation. While digitalisation is crucial for the development of society, it also carries risks, such as cyber risks and infrastructure risks, including the financial-infrastructure risks.

* mag. Andrej Šircelj, Minister of Finance

The changes in the area of digitalisation have to be considered when it comes to state governance as well. Digitalisation should convey greater efficiency of the public sector. This can be achieved by simplifying the governing and decision-making processes, for example by expanding the use of e-invoices to the areas of tax surveillance, offsetting, and similar. There are new challenges ahead, and they are urgent due to climate change and the transition to the digital age. The financial sector will have a great responsibility when it comes to tackling those challenges. How soon the living conditions on our planet will improve depends on the financial sector as well. In light of climate change and the digital economy, the banking system should focus especially on financing the investments in environmentally friendly projects, including the technologies and processes which prevent environmental pollution. The banking system should pay special attention to financing the investments that provide sustainable governance of natural resources, renewable energy, energy efficiency, and clean transportation. Due to the challenges arising from digitalization and climate change, investing in knowledge will also be crucial for the banking sector in the future. In new fields, the banks will need experts who will form plans for technological innovations in all areas, including the digital. New knowledge will contribute to the recovery, the added value, and the competitiveness of the Slovenian economy. By encouraging the progress of knowledge and environmentally friendly investments, we can start changing the future today.

European Council's budget and recovery deal in view of ambitious European Green Deal objectives?

*Mojmir Mrak and Vasja Rant**

The main objective of this article is twofold. First, to present the European Green Deal, outlined by the new European Commission in December 2019, and to discuss its planned funding, and second, to analyse the consistency of the July 2020 European Council budget agreement with the green ambitions of the European Green Deal. In addition to this Introduction and short Conclusions, the text consists of three chapters. The second chapter addresses the pre-COVID-19 situation with respect to green expenditures at the EU level. More specifically, the chapter briefly presents the main features of the December 2019 European Green Deal as well as of its investment arm, called the European Green Deal Investment Plan, from January 2020. The main subject of the third chapter is presentation of the May 2020 European Commission's proposal how the EU should simultaneously address the new challenge of the COVID-19 pandemic and honour its existing commitment to Green transition, articulated in the European Green Deal. And, finally, the fourth chapter presents and assesses the July 2020 European Council financial package agreement in light of the European Green Deal objectives.

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I. Introduction

En July 2020, after five days of intense negotiations, presidents and prime ministers of EU Member States reached an agreement on a EUR 1,824 billion financial package that should boost the economy after the COVID-19 crisis and contribute to the advancement of longer-term development objectives, including the Green transition. The agreement reached by the European Council is, however, not completely final, as it needs to be approved by the European Parliament. Though this institution voiced that the multi-annual budget agreement is not ambitious enough, it can be realistically expected that it will be approved and finalized with only minor adjustments.

The main objective of this article is twofold. First, to present the European Green Deal, outlined by the new European Commission in December 2019, and to discuss its planned funding, and second, to analyse the consistency of the July 2020 European Council budget agreement with the green ambitions of the European Green Deal. In addition to this Introduction and short Conclusions, the text consists of three chapters. The second chapter

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addresses the pre-COVID-19 situation with respect to green expenditures at the EU level. More specifically, the chapter briefly presents the main features of the December 2019 European Green Deal as well as of its investment arm, called the European Green Deal Investment Plan, from January 2020. The main subject of the *third chapter* is presentation of the May 2020 European Commission's proposal how the EU should simultaneously address the new challenge of the COVID-19 pandemic and honour its existing commitment to Green transition, articulated in the European Green Deal. And, finally, the *fourth chapter* presents and assesses the July 2020 European Council financial package agreement in light of the European Green Deal objectives.

II. European Green Deal and its Investment Plan

2.1. Background and objective

The EU has been for decades at the forefront of global action against climate change. Though the EU has adopted policies to reduce its greenhouse gas emissions and has supported energy from clean sources in the past (since 1990, the EU managed to reduce its greenhouse gas emissions by almost 25 per cent), climate policy has only recently become one of the more divisive EU topics, as further reductions in emissions pose transformative challenges for the European economy. On the one hand, there have been vocal movements that mobilised mainly young people demanding stronger climate policies, while on the other hand, there have been backlashes against fossil-fuel price increases, for example in France, as they were perceived as unfair. Similarly, countries and regions whose economies rely substantially on fossil fuels (mostly central and eastern European Member States) have raised their voice, demanding that the transition to clean energy should be fair, with equal opportunities for all.

It is within this context, that in summer 2019, Ursula von der Leyen, at that time the president-designate of the European Commission, promised that broadening and strengthening of the EU climate policy would be the top policy priority of its Commission. The European Green Deal presented in December 2019 is a comprehensive roadmap aimed to turn the EU into a sustainable, carbon-neutral economy by 2050.¹ Together with the EU's digital strategy it constitutes the new EU growth strategy beyond 2020.

2.2. Key pillars

The European Green Deal roadmap covers practically all sectors and seeks to transform them with a combination of

funding measures and regulatory reforms aiming to deliver ambitious climate targets from 2030 to 2050. The key pillars of the European Green Deal are described below²:

The first important pillar of the European Green Deal is *clean energy*. As 75 per cent of EU's greenhouse gas emissions are currently derived from the production and consumption of energy based on fossil fuels, this pillar relates to decarbonizing the EU's energy system, largely through transitioning power generation to renewable resources. In order to promote *industrial sustainability*, the European Green Deal would be aligned with a new industrial strategy to make the EU a world leader in the circular economy and clean technologies, and to decarbonise energy-intensive industries. The regions mostly affected by the low-carbon transition would be supported through a so-called just transition mechanism.

The next area of focus within the European Green Deal relates to the *construction of buildings* as they are significant consumers of energy and mineral resources. The goal within this pillar is to initiate renovation of public and private buildings to improve their energy efficiency, which also contributes towards reducing energy poverty. The Commission proposes to achieve this by rigorously enforcing legislation relating to the energy performance of buildings. Another important pillar of the European Green Deal relates to the transport sector and more specifically to *sustainable mobility*, targeting substantial improvements in energy efficiency, sustainable alternative fuels and propulsion technologies, multimodal transport (including increasing use of rail transport), digitalization of mobility and traffic management, price reductions and more stringent requirements for internal combustion engine vehicles.

With respect to *ecosystems and biodiversity*, the European Green Deal seeks to revise environmental objectives for biodiversity-rich land and sea areas, increasing cross-border cooperation and restoring damaged areas.

The European Green Deal also includes targets for making European agriculture the global standard in sustainability. This so-called »*from farm to fork*« pillar addresses production, food waste, food policy and food consumption.

2.3. Policy instruments for implementation

The European Green Deal sets out a series of policy instruments to reach objectives outlined for each of its pillars. These measures could be classified into four broad categories. One of them are *regulatory reforms* whereby the European Commission will or has already reviewed and proposed new legislative acts aligned with the Deal's

¹ The European Green Deal. European Commission, December 2019.

² A Sustainable Recovery for Europe: The EU's Green Deal. Cleary Gottlieb, July 2020

objectives. The most important examples in this category are³: (i) European climate law, enshrining the 2050 climate-neutrality target into law, (ii) reforms of the EU emissions trading system (EU ETS) aimed at extending the system to new sectors (maritime transport and construction) and gradually increasing the price of carbon allowances or phasing out free allowances (air transport), (iii) increased member state targets to reduce emissions in sectors not covered by the EU ETS under the Effort sharing regulation (iv) carbon border tax, and (v) review of the energy taxation directive.

Another category of policy instruments are *policy proposals* in the form of *strategies and action plans* aimed at addressing specific challenges. Some of the strategies that will have to be adopted include the following⁴: (i) new industrial strategy, (ii) strategy for green financing, (iii) comprehensive plan to increase the EU emissions reduction target for 2030 towards 55 per cent, (iv) »farm to fork strategy« on sustainable food along the whole value chain, (v) cross-cutting strategy to protect citizens' health from environmental degradation and pollution, (vi) biodiversity Strategy for 2030, and (vii) new circular economy action plan. By late 2020, the Commission has already presented proposals on several of the above-mentioned strategies and action plans.

The third category of policy instruments to implement European Green Deal are *Member States' activities*. Taking into account subsidiarity as one of the key EU principles, the European Commission plans to make use of the existing institutional frameworks for coordination of member state actions to ensure that national policies contribute to the European Green Deal's objectives. One obvious example of this kind are the existing national energy and climate plans that outline how Member States plan to address key climate objectives over the 2021-2030 period. Another one is integration of "green" conditioning into the European Semester framework of medium-term budget objectives. In order to implement European Green Deal objectives massive *investment funding* would be required. The next chapter presents in some details how the European Green Deal was planned to be financed under the January 2020 Investment Plan.

2.4. European Green Deal Investment Plan

The European Green Deal Investment Plan presented in January 2020 is the investment component of the European Green Deal. To achieve the Deal's objectives, the Investment Plan seeks to mobilise at least EUR 1,000 billion of

financing for sustainable projects, to create a framework for private and public investors, to facilitate sustainable investments and to support public administrations in structuring and executing sustainable projects over the 2021-2030 decade⁵. Around a half of the total amount would come directly from the EU budget, whereas other public and private financial resources would provide the remainder, mainly through a leverage effect based on an EU budget guarantee. The European Green Deal Investment Plan envisages five broad sources of climate finance that would support a broad range of projects and contribute to the Green Deal objectives. They are presented in a descending order of their financial importance.

EU budget (EUR 503 billion); The Investment Plan was based on the May 2018 proposal of the European Commission for the multi-annual financial framework 2021-2027. Running for 7 years, the financial framework was expected to mobilise 25 per cent of total EU budget for climate financing and invest in environmental objectives through several EU programmes. Extrapolated to 10 years and assuming the climate targets will be at least maintained post-2027, the long-term budget is expected to deliver €503 billion. Instruments that should make significant contributions to this objective include: the funds under the Common Agriculture Policy, the European Regional Development Fund, the Cohesion Fund, the Horizon Europe framework programme for research and innovation, the LIFE programme, and the Connecting Europe Facility.

The European Investment Bank (EIB) and other investment partners in the context of InvestEU (EUR 279 billion);

The May 2018 proposal for the 2021-2027 multi-annual financial framework included the creation of the InvestEU programme that would streamline in a single investment scheme the operations currently carried out under the European Fund for Strategic Investments (EFSI) and various financial instruments supported by the EU budget.

As such, InvestEU was expected to be the key tool to exploit the EU budget's ability to leverage additional private and public funding for investment in internal Union policies. *Just Transition Mechanism (EUR 143 billion)*; The transition to a greener economy will have significant social ramifications for certain European regions, in particular due to job losses in carbon intensive industries. For this reason, together with the Investment Plan, the Commission presented a package of measures – the Just Transition Mechanism – intended to alleviate the social impact of this transition on the Member States that are still substantially depending on fossil fuels. Just Transition Mechanism consists of three

³ Ibid.

⁴ Ibid.

⁵ European Green Deal Investment Plan: Main elements and possible impact of the coronavirus pandemic. European Parliament, April 2020.

components: (i) Just Transition Fund, endowed with €7.5 billion of fresh money up to 2027 and a novelty as compared to the 2018 Commission proposal for the 2021-2027 (to generate financing of EUR 30 to 50 billion primarily in grants), (ii) a specialised just transition scheme under the InvestEU to crowd in private resources (to generate EUR 45 billion of private sector financing), and (iii) a new public-sector loan facility with the EIB to leverage additional public funding (to mobilize EUR 25 to 30 billion of public sector financing).

Member States (EUR 114 billion). By design, the European structural and investment funds, such as the ERDF and EAFRD, imply a certain level of co-financing from national authorities.

Emission Trading System - ETS (EUR 25 billion); The ETS is EU's carbon market and encompasses sectors responsible for 45 per cent of EU emissions. Part of the revenue stemming from auctioning carbon allowances under the ETS is allocated to two funds (Innovation and Modernisation funds) that finance climate-related projects outside the multi-annual financial framework.

2.5. European Green Deal under the May 2018 European Commission's 2021-2027 multi-annual financial framework proposal

In May 2018, Juncker's European Commission proposed a multi-annual financial framework for the period 2021-2027. The proposal was prepared for a 27-member EU following Brexit and in an environment of intensified international as well as internal challenges for the EU. This in practice means that the proposal worth EUR 1,135 billion was slightly bigger compared to EU-27 spending in 2014-2020 (see the table in the sub-chapter 4.1.). As far as the structure is concerned, the European Commission proposed a re-balancing of spending priorities, reducing the relative weight of the Common Agricultural Policy, and Cohesion policy in the budget and increasing spending on new priorities, especially on internal and external security and migration policies. As far as the cross-cutting agenda of climate changes is concerned, the European Commission claimed that 25 per cent of total spending under the 2021-2027 proposal, which in nominal figures translates to EUR 320 billion, would contribute to the climate objectives. This was presented as a significant increase over the ongoing 2014-2020 medium-term financial framework where 20 per cent of total spending, i.e. EUR 206 billion, is classified as addressing climate changes objectives⁶.

Although it was originally planned that the European Council agreement on the 2021-2027 multi-annual financial framework should be reached till the end-2018 under the Austrian presidency and the agreement with the European Parliament before the May 2019 European elections, the negotiations were *de-facto* postponed until the end of 2019 when the big transition at the helm of the main EU institutions – with newly elected European Parliament, new president of the European Council and the new European Commission, was completed.

As presented in previous sub-chapters, the new leadership of EU institutions, especially the European Commission, has put the climate agenda, articulated within the European Green Deal, as its top policy priority. Independent analyses estimate that yearly average of additional investment, public and private, that are necessary to achieve the EU 2030 climate and energy targets centred on the greenhouse emissions reduction of 50 – 55 per cent by 2030 are within the range of EUR 300 billion per year over a 10-year period⁷. This in practice means that EUR 1,000 billion to be mobilised with the European Green Deal Investment Plan represents only one third of the additional investment needs associated with the implementation of the Deal, and that national governments and the private sector are expected to cover a large majority of the investment gap.

Furthermore, a significant proportion of EUR 1,000 billion to be mobilised with the European Green Deal Investment Plan cannot really be considered as additional but rather represent reshuffling of funds within various existing programmes. For example, in the European Green Deal Investment Plan the European Commission claims that the 25 per cent allocation of the EU budget to climate objectives means EUR 503 billion of additional funds for filling the funding gap. This is an exaggeration for at least three reasons⁸: First, not all these expenditures can be considered as investments since they include such items as agriculture subsidies. Second, because 25 per cent allocation for climate objectives in the EU budget represents only an increase of 5 percentage points over the 2014-2020 period. This means that the additional climate objective expenditures amount to only EUR 10 billion / year and not 50 billion / year as the document suggests. And third, evidence provided by the European Court of Auditors clearly indicates that the existing methodology to track EU budget climate spending overstates it. This is especially the case in spending related to the Common Agricultural Policy⁹.

⁶ A Modern Budget for a Union that Protects, Empowers and Defends: The Multi-annual Financial Framework for 2021-2027. European Commission, May 2018

⁷ A trillion reasons to scrutinise the Green Deal Investment Plan. Bruegel, January 2020.

⁸ Ibid.

III. Integration of the European Green Deal into the COVID-19 induced revision of the EU budget proposal

3.1. COVID-19 crisis and its implications on EU budget negotiations

COVID-19 pandemic is a shock unparalleled in modern history. The outbreak of the crisis was at the beginning primarily a major health problem. To meet this challenge, countries around the world responded by severely restricting movements of the population, and this led to a practical economic lock down.

Unlike in the previous global financial crisis, this time the countries around the world responded to the crisis fairly quickly and boldly. The central banks of all major countries have further loosened their already loose monetary policies and flooded economies with huge amounts of liquidity, while the governments have, as a rule, provided large fiscal stimulus packages, aimed at achieving two main goals. The first one was to prevent the collapse of the real sector by providing liquidity to the economy and by creating conditions for maintaining jobs, and the second goal was to provide basic social security for the population.

The EU institutions also responded to the crisis much faster and more decisively this time than a decade ago. Already in March, the ECB increased its purchases of securities under the existing quantitative easing program by EUR 120 billion, and shortly then after adopted a new securities repurchase programme in the amount of EUR 750 billion. In addition to providing liquidity to the banks and countries, ECB's action was also aimed at expanding the supply of liquidity to the corporate sector.

The European Commission also reacted rather quickly. It loosened the European fiscal rules, enshrined in the Stability and Growth Pact, so as to make it easier for the Member States to finance the crisis without having to worry about budget deficits. It also introduced more flexible application of state aid rules in order to allow the Member States to support their economies and populations with funds from their own budgets. Further on, the European Commission redeployed some of the EU budget's cohesion funds from the 2014-2020 financial framework to combat the new Coronavirus, and took decisions that are necessary to increase the EIB role in financing anti-crisis measures. There is no doubt that all these measures were useful, but their scope still remained rather limited compared with the magnitude of the problem. This only confirms that the main fiscal response to the COVID-19 crisis was, as in previous

crises, again left predominantly to the Member States with the EU budget remaining a side-line player.

At a fairly early stage of the COVID-19 crisis, the EU Member States agreed that in order to deal with the crisis successfully and, in particular, to exit from the crisis effectively, the resources available to countries at the EU level need to be significantly increased. Unfortunately, this was also the only point of agreement at that stage of the crisis, as Member States had very different views about a number of key issues, such as how large the level of EU funding should be (from some 100 to EUR 1,500 billion), through which institutional framework the funds should be provided (upgrading existing instruments, setting up one or more new instruments), or what type of funds would be needed (transfers, loans, guarantees, or a combination of these). Taking into account that the EU members states failed to reach an agreement about the 2021-2027 multi-annual financial framework in February 2020, i.e. before the outbreak of the COVID-19 crisis, an important question at that time was also whether the financial response at the EU level should be an integral part of the 2021-2027 multi-annual financial framework or not.

By and large, positions of EU Member States on these issues could be divided into two groups. The core of the first group consisted of nine Euro area Member States. In mid-March, they addressed an initiative to the President of the European Council to issue common EU debt worth more than EUR 1,000 billion in the form of "corona bonds", which would be jointly guaranteed by euro area Member States. The supporters of this proposal have argued that any financial instrument funded by corona bonds that aimed to help individual Member States facing the COVID-19 crisis should not take the form of debt, as this would further weaken their public finances and the potential for a successful exit from the crisis. This was therefore a proposal for a new grant-type financial instrument with a strong element of solidarity.

In contrast, the group of mainly northern EU Member States argued for a vastly different solution. While they agreed about the need to provide more funding at the EU level to finance COVID-19 crisis mitigation measures, their proposals were significantly less ambitious in terms of volume. Further on, these countries advocated reliance on the existing institutions, such as the European Stability Mechanism and the EIB, and on instruments of an exclusively debt-generating character.

Until March 2020, the 2021-2027 medium-term financial framework negotiations had followed the path largely predetermined by the Commission's May 2018 proposal. COVID-19 crisis, however, gave a new impetus to the

⁹ Tracking climate spending in the EU budget. European Court of Justice. 2020

on-going negotiations, opening up the possibility for the Commission to make innovative proposals to further develop the EU budget. In March 2020, the European Parliament asked the Commission to reformulate and adjust its spending priorities to the new priorities and to submit a new multi-annual financial framework proposal. Moreover, in April 2020, the European Council instructed the European Commission to design an entirely new recovery fund that would be in terms of size and its characteristics appropriate to deal with the depth of the COVID-19 crisis. The Commission was also specifically instructed to articulate the relation of this fund with the multi-annual financial framework, making the fund a part of the overall multi-annual financial package to be negotiated. Soon after, Germany and France came out with a joint proposal advocating the establishment of a fund of EUR 500 billion to be financed by joint borrowing of the Member States that would importantly hand out money to Member States in the form of grants. This political backing was instrumental for the European Commission to design an entirely new financial package for the 2021-2027 period. With this unexpected turn of events, the European Commission got an excellent opportunity to redraft the multi-annual financial framework together with the recovery fund and realign it to support the European Green Deal objectives with more appropriate funding from the EU level.

3.2. May 2020 proposal of the European Commission for the 2021-2027 EU budget and its climate-related funding content

In May 2020, the European Commission presented its new financial proposal for the forthcoming medium-term period titled “The EU budget powering the recovery plan for Europe”. The proposal consisted of two components. The first one is a revised 2021-2027 multi-annual financial framework with commitment appropriations of EUR 1,100 billion, a slight decrease against the May 2018 proposal (see the table in the sub-chapter 4.1.). However, in addition to the ‘core’ multi-annual financial framework and as part of the EU budget, there was an entirely new component, a EUR 750 billion recovery instrument called the “Next Generation EU”. The instrument would be debt-financed and the financial support would be partly allocated through grants (EUR 500 billion) and partly through repayable loans (EUR 250 billion). Spending should be aligned with the EU policy goals, in particular with green and digital transitions. It was supposed to focus on the first years of recovery, rather than becoming permanent. Repayment of the debt would not begin before 2028. As far as climate-related funding is concerned, by far the

most important aspect of the new EU budget proposal was an overall increase in the size, in particular because the new proposal maintained the 25 per cent target for climate mainstreaming across all spending items from the May 2018 proposal. As a result, a larger EU budget – thanks to additional funds from the “Next Generation EU” plan – should in principle lead to more spending on climate-related measures. All methodological problems associated with this type of measuring climate-related expenditures remain the same as discussed in sub-chapter 2.5.

This rather general and non-differentiated approach to climate-related funding in the new proposal of the European Commission could be explained by the COVID-19 induced priority to use the EU funds whereby the overriding priority of EU Member States at least in the short run has become to minimize the economic impact of the health crisis and to maintain employment levels. In a crisis environment, poorer citizens may be more reluctant to bear the cost of climate-friendly policies, because in the short-term such policies could destroy even more traditional jobs. Further on, in an economic crisis, investments in low-carbon technologies compete more than ever with other investments, such as building transport infrastructure, which are at least in the short run often more job-intensive.

IV. The July 2020 European Council agreement and its climate-related contents

4.1. Main features of the agreement

In July 2020 EU leaders agreed on both financial instruments proposed by the European Commission after long and difficult negotiations. The multi-annual financial framework is worth EUR 1,074 billion for the 2021-2027 period and is slightly lower than proposed by the Commission while the «Next Generation EU» remained at proposed EUR 750 billion for 2021-2024 though with a structure that under the pressure of the so called “frugal four” countries – the Netherlands, Sweden, Austria, and Denmark – changed towards a higher proportion of loans. Their total volume increased to EUR 360 billion, which means that the grant segment was reduced to EUR 390 billion, in view of the “frugal four” below the psychological EUR 400 billion limit.

The following table provides an overview of how the EU financial package 2021-2027 was developing from the first Commission’s proposal from May 2018 reflecting the pre-COVID-19 situation over its second proposal from May 2020 incorporating a new reality caused by the COVID-19 till the July 2020 agreement at the European Council level. The agreed EU financial package for the 2021-2027

period is, indeed, very different from its predecessors and represents the most substantial conceptual change of the EU budget since the introduction of the multi-annual financial frameworks in the late 1980s. The EU budget will be in the forthcoming years not only significantly larger than in the past but it will also provide, for the first time in history, an institutional framework for the EU to borrow in order to fund grants on such a large scale. Further on, the package, especially its European recovery facility component, is the first EU's common counter-cyclical instrument and is not associated with austerity provisions. On the contrary, it is targeted to fight the COVID-19 crisis and to finance growth-enhancing investment opportunities complemented with structural reforms.

4.2. European Council agreement in view of European Green Deal objectives

The EU financial package reached at the July 2020 European Council was primarily guided by the COVID-19 crisis considerations. Climate actions were not among the most controversial themes of the negotiations, and the final deal does contain a strong climate transition component in line with the pledge of the presidents of the European Council (Charles Michel) and the European Commission (Ursula von der Leyen). While the European Commission's proposal put its spending target for climate actions at 25 per cent of the total, the final package agreed by the presidents and prime ministers of EU Member States raised it to at least 30 per cent, which is a 10 percentage point increase relative

to the 2014-2020 financial period, applied to a larger budget. So, the final deal should generate about EUR 547 billion of green expenditure (30 per cent of EUR 1,824 billion), while in the Commission's proposal this was around EUR 463 billion (25 per cent EUR 1,850 billion). In terms of climate action expenditures, the 2021-2027 EU financial package is even more impressive if compared with the current multi-annual financial framework. The agreed spending on green projects is about three times higher than under the 2014-2020 multi-annual financial framework. Under this framework, the EU planned to spend about EUR 182 billion on green expenditures (20 per cent of EUR 908 billion) and according to the Commission, it is on track to broadly reaching this target¹⁰.

In spite of the fact that the final deal implies some EUR 85 billion of extra green expenditures vis-à-vis the May 2020 European Commission's proposal, this still represents only a quarter of around EUR 300 billion of total annual investments required to reach a 50 to 55 emissions reduction by 2030 as a target date. In addition, and as already explained, there is a high probability that due to the weaknesses of the methodology expenditures considered as contributing to climate objectives are significantly overstated. Within this context, it is highly appropriate that the EU leaders asked the European Commission to develop an effective methodology for monitoring climate spending and its performance, and to report on it annually. That represents

¹⁰ How green is the EU budget and recovery deal? ING, July 2020.

Commitment appropriations, EUR billion, 2018 prices	2014-2020 (EU-27)	Comm. proposal May-18	Comm. proposal May-20			European Council agreement July 2020		
	MFF	MFF	MFF	NGEU	Total	VFO	NGEU	Total
1. Single market, innovation & digital	116	166	141	70	210	133	11	143
Horizon Europe	67	87	81	14	94	76	5	81
2. Cohesion, resilience and values	387	392	379	610	989	378	722	1.100
Cohesion policy	369	332	323	-	323	330	-	330
Recovery & resilience instrument	-	-	-	560	560	-	673	673
Grants	-	-	-	310	310	-	313	313
Loans	-	-	-	250	250	-	360	360
REACT EU	-	-	-	50	50	-	48	48
3. Natural resources and environment	400	337	357	45	402	356	18	374
Common agricultural policy	383	324	333	15	348	336	8	344
Just transition fund	-	-	10	30	40	8	10	18
4. Migration and border management	10	31	31	0	31	23	0	23
5. (Resilience), security and defence	2	24	15	10	25	13	0	13
6. Neighbourhood and the world	96	109	103	15	118	98	0	98
7. European public administration	71	76	75	0	75	73	0	73
TOTAL	1.082	1.135	1.100	750	1.850	1.074	750	1.824

Source: Official document of the European Commission and the European Council.

an important step to ensure that the 30 per cent target provides a realistic information about climate spending. Though the overall amount of money that should flow to the green transition has actually increased compared with the May 2020 proposal of the European Commission, some green programmes were reduced in the course of the negotiations. The most typical example is the significant cut of the Just Transition Fund. EU leaders namely agreed to more than halve the total volume of this instrument from the Commission's proposal, from EUR 40 billion to EUR 17.5 billion in order to reach an agreement for which unanimous decision of all EU Member States is needed. From the climate agenda perspective, this is a major downside of the agreement, as the instrument is specifically aimed at the social inclusiveness and political acceptability of the green transition. It is, however, fair to mention that the May 2020 proposal of the European Commission for Just Transition Fund, was dramatically higher than a corresponding figure – around 8 EUR billion – that was at table on the February 2020 European Council.

Another unwelcome decision of the July 2020 European Council, especially for attracting private sources into green project financing, was the reduction of the funds from New Generation EU allocated to InvestEU from EUR 30.3 billion in the Commission's proposal to only EUR 5.6 billion in the Council's agreement. These funds were partly supposed to encourage the EIB to increase its investment in riskier, but potentially highly rewarding, green projects. It is true that even without InvestEU funds EIB has large own resources, but this decision still has a negative impact on the institution's ambitions to transform itself from a classical investment bank into EU's climate bank¹¹.

As part of the deal, EU leaders agreed that the share of the Common Agricultural Policy expenditure that is expected to be dedicated for climate action should be 40 per cent. In order to implement this decision, the European Commission will need to take strong policy and monitoring actions over the next seven years¹². This is key to deliver on the European Green Deal's environment and biodiversity pillars.

And finally, EU leaders agreed about some new own resources to pay back funds raised under the New Generation EU instrument. More specifically, they agreed on a new plastic tax that will be introduced in 2021, as well as on a carbon border adjustment measure also to be prepared in the first half of 2021 with the main idea of the latter proposal being to prevent carbon leakage (either through imports of under-priced products with a high carbon foot-

print or by outsourcing of EU production to locations with less stringent climate standards). EU leaders also asked the European Commission to propose a revision of the EU emissions trading scheme (ETS) in a way that it extends to the aviation and maritime transport sectors.

V. Conclusion

EU budget is by far the most important instrument for implementation of policy priorities at the EU level. It was therefore practically impossible for the "new" European Commission to integrate more forcefully the European Green Deal as its top policy priority into the proposal for 2021-2027 multi-annual financial framework prepared by its predecessor, the "old" European Commission, just before the end of its term. It has been confirmed once again that EU institutional framework whereby an outgoing European Commission is responsible for designing a medium-term financial framework to be implemented by a new, incoming European Commission is far from being optimal. The COVID-19 crisis and its dramatic economic implications have de-facto forced the EU Member States to put in place a much stronger fiscal response at the EU level than ever before. It is within this context that the "new" European Commission got an opportunity to redesign a significantly increased EU budget more in line with the European Green Deal ambitions. Consequently, there is no doubt that this is by far the greenest medium-term financial plan at EU level we have seen so far. How this plan will actually be implemented will, however, depend crucially on how really green will be the national recovery plans to be prepared and submitted by the Member States and how effectively the European Commission will monitor them.

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¹¹ Is the EU Council agreement aligned with the Green Deal ambitions? Bruegel, July 2020.

¹² Conclusions of the special meeting of the European Council (17, 18, 19, 20 and 21 July 2020).

Should banks invest into “green” companies? – Empirical evidence from Europe

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Banks' investments into companies, either via crediting or holding shares, can be risky. On the other hand, green companies employing green practices and green innovations that struggle for environmental sustainability, are often referred to as safe investments. Based on the European companies deploying classical least squares regression methodology, we evaluate the effect of “level of green” to companies financial performance. The results indicate that green companies are supposed to be safer investments than non-green ones.

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1. Introduction

Going green has become a must not only for forward-looking industries and companies, but also for those that want to survive at least on a mid-term horizon. Unlike the situation during the financial and economic crisis in 2007/2008, today's insecure economic environment is caused by fast digitalisation processes, trade wars, and pandemics. Compared to the aforementioned processes, the global warming and public pressure on industries and companies to counteract, have actually become quite a stable factor. Banks share most of the cross-sectoral problems plus the perils arising in their own industry. Their traditional role is endangered by evolving online fintech banking, as well as by difficulties in controlling cryptocurrencies, resulting in a higher risk exposure for their business. Therefore, especially in times of low interest rates, investment gains importance in sectors and in companies where the risks are smaller and/or controllable. All this allows for the conclusion that, apart from their financial health, banks are stimulated to additionally consider their stance regarding green economy.

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Green companies (hereinafter environmentally sustainable companies) are companies that employ green and green product innovation practices to assure a greener future, economic growth, environmental sustainability, and a better quality of life (Dangelico and Pujari (2010)). Such companies are supposed to be treated as more suitable clients to banks for financing (crediting) and holding shares in investment portfolios than non-green companies. Banks that invest in green companies are implicitly better guaranteed to make safe investments. In this paper, we predict the company's (financial) performance in the current year, employing financial performance data and past climate scores. This allows us to examine whether green companies are supposed to be treated as more convenient investments for banks.

A stepping stone in adapting green practices is the reference work by Hart and Milstein (2003), who define a novel business orientation called sustainable-value framework. Instead of considering only a single viewpoint, i.e., creation of stakeholder's value, the sustainable-value framework considers both, stakeholder's value and global sustainability. The sustainable-value framework categorises internal and external green strategies and practices, with (i) internal green practices proposing pollution prevention strategies and clean technology appliances, and (ii) external green practices incorporating product stewardship and sustainability vision. A company that follows the sustainable-value framework thus struggles for (i) solid financial performance, which is invaluable and mandatory for future business activities and competitiveness in raw financial markets and (ii) green investment or level of green, i.e. level of actions that preserve environmental issues (Sari and Hasnelly (2012)). Both criteria are broadly introduced in a feedback-communication conceptual model by Sari and Hasnelly (2012), together with supporting roles of public government policy and customers. Customers and environment also play an invaluable role in a model by Chariri, Ratna Sari Br Bukit, Bethary Eklesia, Uly Christi and Meirisa Tarigan (2018), who clarify that globalisation and rapid economic growth entail a business paradigm shift, i.e. from a single P (Profit) to the triple P (People, Planet and Profit). Green companies attract more and more potential shareholders and green investments heavily affect financial performance statements (see the attached sample of studies below).

Miroshnychenko, Barontini and Testa (2017) analysed the impact of benefits of green strategies and practices on the Corporation Financial Performance (CFP), employing a sample of large companies from 58 well-developed countries over a period of 13 years. They analyse the strength of the linear relationship between (i) two internal practices, e.g.

pollution prevention and green supply chain management, (ii) one external practice, e.g. green product development, and (iii) voluntary adoption of environmental standards, e.g. ISO 14001. In their linear OLS regression model, CFP (dependent variable) is proxied by Tobin's Q and ROE (return on equity), and leverage, sales growth, firm size as well as a vectors on the country of origin, industry and, the respective year are utilised as control variables.

The results for the first internal practice, i.e. pollution prevention, show that this strategy globally correlates strictly and significantly with the CFP. This finding is in accordance with the results of Hart and Ahuja (1996) who examine the paradoxical idea if it pays off for large corporations to go green. On the general sample of S&P 500, they conclude that companies which struggle to abate pollutant emissions are indeed more profitable in the future. However, the level of increased profitability depends on the type of the business activity and the level of pollution reduction. On average, ROS (return on sales) and ROA (return on assets) tend to significantly increase within a single year, ROE within two years. Another prominent case study dealing with a similar question (i.e. does it pay to be green) by King and Lenox (2001) outlines that there is a significant connection between total and relative emissions and financial performance, but the direction of the relationship is uncertain.

Hence, it is more important to wonder and explain "when does it pay to be green", since this depends on the nature of the business activity and the amount of reduction in pollution. We agree that the more pollution-intensive the corporation is, the more it can benefit.

A second internal practice, e.g. green supply chain management (activities that stimulate the suppliers to reduce environmental impact) as designated by Miroshnychenko et al. (2017) show off as significant and positive too. The association between green supply chain and firm financial performance tend to be highly significant for both, Tobin's Q and ROE, either stand alone or compounded with other practices. This is in accordance with the latest case study by Feng et al. (2018) who analysed the Chinese automobile manufacturers. They realised significant and positive direct associations of green supply chain management with operational and environmental performances, and indirect association with financial performance. On the other hand, Testa and Iraldo (2010) described the green supply chain as positively contributing towards the greener world, but unclearly effecting on financial performance.

Green product development (third practice) by Miroshnychenko, Barontini and Testa (2017) tends to significantly positively affect firm's financial performance. Still, authors state that the external practice of green product devel-

opment is secondarily important towards a firm's financial performance. This is in accordance with case study report by Leenders and Chandra (2013) who contribute that the effect of green product innovation to business performance is larger when producers exploit direct sales channels. Lin, Tan and Geng (2013) performed a case study on the Vietnamese motorcycle industry and by analysing empirical results, they find that green product innovation positively correlates with the firm's financial performance and market demand.

The fourth green practice or adoption of environmental standard (e.g. ISO 14001) does not contribute to better financial performance (Miroshnychenko, Barontini and Testa (2017)). The authors realise that the association between the adoption of environmental standards and financial performance proves negative but significant to Tobin's Q, and slightly positive but not significant to ROE. This research findings agree with Link and Naveh (2006) who discovered that better environmental performance due to adoption of ISO 14001 does not lead to better financial performance. Ferrón-Vílchez (2016) clarified that adoption of ISO 14001 may contribute to better business performance, but the adoptions must be substantive ("symbolic" adopters do not get any gain). Also, according to Chariri, Ratna Sari Br Bukit, Bethary Eklesia, Uly Christi and Meirisa Tarigan (2018), the adoption of ISO 14001 for the Indonesian companies did not stimulate investing in green practices. In general, we can conclude that environmental sustainability actions, either internal or external, improve firm's financial performance. Green companies can be treated as better or safer investments compared to non-green, pollution-intensive companies. For instance, according to Mahler, Barker, Belsand and Schulz (2009), the so called "green winners" achieved above-average returns on financial markets in the financial crisis 2007 to 2009.

The research question of this paper is as follows: Should banks invest in green, i.e. environmentally sustainable companies? We test the hypothesis for the EU companies on the latest financial data available. We place the astonishing results of our conducted research into the domain of interest of the Slovenian banks. Furthermore, we supply additional empirical evidence about the effects of environmental sustainability on their financial performance and attempt to realise whether such companies should be more interesting to be held in their investment portfolios. The structure of the paper is as follows: Chapter two outlines the datasets and describes the relevant variables. Chapter three discloses experiments and results. Finally, section four concludes with a discussion and outlines potential future research.

2. Sample Data

The data on climate scores¹ is obtained from the disclosure organisation CDP,² collecting environmental data on investors, companies and cities, in order to monitor their environmental impact and to propose good practices for a sustainable economy. CDP scoring categorises three environmental areas, namely (i) climate change, (ii) forests, and (iii) water. In this study, we singularly employ company data on climate change. CDP collects data via online questionnaires that address managing environmental stewardship. Typically, companies fill in these questionnaires by themselves and CDP's scoring partners score them. Although the questionnaires include some cross-checking mechanisms that are embedded into the scoring system and can automatically compare consistency of answers, neither CDP nor CDP's scoring partners verify these results (responses). Thus, the obtained data is treated as relevant and accurate as companies respond. More relevant information and instructions about scoring can be found in the annual CDP's publication "Introduction to Scoring".³ For this study, we have collected all companies with valid indications on climate change scores, yielding an original sample population of 2,048 observations.

The CDP's scoring methodology is divided into four levels (viewpoints) as follows: (i) disclosure level, (ii) awareness level, (iii) management level, and (iv) leadership level. The disclosure level aims at evaluating the amount of information disclosed. It considers all questions included in the questionnaire, usually awarding each filled question by one point. In case that a question is of higher importance or in the form of text response, more than point can be awarded for each question. The awareness level measures the company's perception or recognition that business activities affect the environment. It does not consider any monitoring or management actions, as these are considered in the management level. In order to proceed to the management level, certain minimum points awarded (the threshold set by CDP) must be scored in the awareness level. The management level deals with acknowledging empirical evidence and actions that demonstrated care for the environment in the past. These responses follow a specialised treatment, i.e., responses at the management level are evaluated according to the predetermined weight setting ensuring that more comprehensive responses score substantially higher. Finally, the leadership level questions are scored, addressing best practices in advancing environ-

¹ <https://www.cdp.net/en/companies/companies-scores#446647786929955804cc9a3a08ef1eb4>

² <https://www.cdp.net/en/>

³ <https://www.cdp.net/en/guidance/guidance-for-companies>

mental stewardship. The companies that show high points at the leadership level, as well as in all other levels, are promoted as leaders. They are promoted by CDP with the total score "A" and are specifically acknowledged by including them in the so-called A-List. Furthermore, these companies are often advertised as examples of good practices. Other options incorporate letters ranging from A- to D- (A, A-, B, B-, C, C-, D, D-), where D- represents companies least struggling for environmental sustainability. For a detailed description of the scoring rules see CDP's reference publication.

In the following paragraph, we attach only a limited sample of rules. Disclosure and awareness level scores are determined by dividing the number of points awarded by a maximum number of points available. Furthermore, we multiply this ratio by 100 to obtain percentages and round it to the nearest integer. Management and leadership level scores are computed by weighting each scoring category specifically. As these weightings express relative importance of each question, regarding the final score, they are pre-declared by CDP. Points can be awarded in one of three ways for all levels: (i) cumulatively for all data points, with missing data not being penalised, (ii) obligatory, where all data points must be answered or provided, with missing data in a single data point being penalized by zero points awarded for the complete category and, (iii) proportionally to the amount of data disclosed. If companies treat some information confidential, this information does not need to be disclosed, but companies must be aware of the CDP total score being penalised. For questions of higher importance, this might mean that the total score is significantly penalised, while it is not for questions of proportional scoring.

We should note that the CDP's database is just one source of environmental data and that many alternative databases exist. For example, Bloomberg and Thomson Reuters publish ESG scores, which stand for environmental, social and governance factors. RepRisk collects environmental data for more than 84,000 companies worldwide. Further databases are listed on Harvard's website.⁴ We have decided to use the CDP database due to funds limitations, since it allows for a free access. We have managed to obtain a dataset of companies in the relevant range for the year 2019.

The corresponding company data was obtained from the ORBIS database.⁵ The data was taken from the financial statements with a closing date in the respective year. The companies with valid climate change scores were matched

with company data on the respective company name, as well as the country of origin and its legal form. We dropped all companies where no clear match was found. Both datasets were exploited to form two dependent variables as follows: First, ROI is computed by earnings before interest and tax divided by total capital, with total capital being denoted by liabilities, accruals, deferrals, non-capitalised leases and, already determined distributions. Second, ROE is computed by earnings before tax divided by equity capital, with equity capital being denoted by shareholder's funds, reserves and profit/loss carryforwards minus already determined distributions as well as equity included in goodwill (estimated).

In order to define the explanatory variables, we examined a comprehensive set of 19 ratios and 5 ratio systems serving as control variables, in their entirety being related to the three primary drivers of company value (i) profitability, (ii) growth and, (iii) risk. We conclude that the ratio systems provide superior explanatory power with (i) the Quicktest ratio system indicating profitability, as well as risk, and (ii) the remaining ratio systems (namely Altman's z-score, the Beermann ratio system, the Bleier ratio system and, the Weinrich ratio system), entirely working as early warning systems to detect financial distress, thus indicating risk. The Quicktest ratio system is computed employing the 2018 score, as well as the change in score from 2017 to 2018 (being based on the 2017 and 2018 company data). The early warning ratio systems are computed by employing 2018 company data (the Bleier ratio system additionally employs 2016 and 2017 data).

In the subsequent paragraphs we describe the control variables. For all five ratio systems, equity and debt capital are defined as follows: Equity capital is denoted by shareholder's funds, reserves, and profit/loss carryforwards minus already determined distributions, as well as equity included in goodwill (estimate). Debt capital is denoted by provisions, liabilities, deferrals, non-capitalised leases, and already determined distributions.

First, the Quicktest ratio system (Grbenic, Zunk and Baumüller (2018, 179-181)) employs four ratios, with each emphasizing on one of the four fundamental areas of financial analysis (i) financing, (ii) (dynamic) liquidity, (iii) profitability and, (iv) earnings, in its entirety aiming at collecting maximum information from the financial statement. While the further two areas indicate financial stability, the latter two indicate the earning power of the company. First, the area of financing is proxied by the equity ratio, indicating the share of equity on total capital. It is computed by equity capital divided by total capital (denoted by equity plus debt capital). Second, the area of (dynamic) liquidity is

⁴ <https://corpgov.law.harvard.edu/2017/07/27/esg-reports-and-ratings-what-they-are-why-they-matter/>

⁵ <https://orbis.bvdinfo.com/version-2020820/orbis/Companies/Login?returnUrl=%2Fversion-2020820%2Fforbis%2FCompanies>

proxied by the debt-settlement period, indicating the power of the company to settle its debt. It is computed by debt capital minus cash and cash equivalents, divided by the operating cashflow. Third, the area of profitability is proxied by the return on assets, indicating the efficiency of the management employing company's funds. It is computed by earnings before interest and tax divided by total capital (denoted by equity plus debt capital). Finally, fourth, the area of earnings is proxied by the cash flow yield, indicating the cash returning into the company in percent of sales. It is computed by the operating cashflow divided by sales. According to the values of the ratios, scores are denoted to all four ratios employing a rating scale, and subsequently a total score is computed by summing up the ratio-specific scores. We employ the Quicktest score as a control variable in twofold ways: First, we utilise the simple total score for the year 2018, and second, we use the absolute change in the total score from 2017 to 2018.

Second, the z-score ratio system by Altman (1968) employs a variable profile that contains five ratios: (i) Working capital (denoted by short-term assets minus short-term total capital) to total assets (including non-capitalised leases), (ii) retained earnings (denoted by the operating cashflow divided by sales) to total assets (including non-capitalized leases), (iii) earnings before interest and tax to total assets (with the latter including non-capitalized leases), (iv) market value of equity (market capitalisation; in case no market capitalization is available, it is proxied by its book value) to book value of debt capital and, (v) sales to total assets (with the latter including non-capitalized leases). The values of the five ratios are weighted by their respective regression determinants, resulting in weighted values. Subsequently, the ratio-specific values are summed to the z-score. We employ the absolute z-score as a control variable.

Third, the ratio system by Beermann (1976) employs a variable profile that contains ten ratios: (i) Depreciation on tangible fixed assets to opening book values plus entries in tangible fixed assets, (ii) operating cashflow to liabilities, (iii) entries in tangible fixed assets to depreciation on tangible fixed assets, (iv) liabilities to total capital (denoted by equity plus debt capital), (v) earnings before tax to sales, (vi) earnings before tax to total capital (denoted by equity plus debt capital), (vii) liabilities due to banks to total liabilities, (viii) sales to total capital (denoted by equity plus debt capital), (ix) inventory to sales and, (x) earnings before tax to liabilities. The values of the ten ratios are weighted by their respective regression determinants, resulting in weighted values. Subsequently, the ratio-specific values are summed to the total score. We employ the absolute total score as a control variable.

Fourth, the ratio system of Bleier (Grbenic, Zunk, and Baumüller (2018, 215-218)) provides specific ratio systems for various sectors. Since the sample companies are spread across various sectors, we employ the ratio system not emphasising on a specific sector. In contrast to the remaining ratio systems in their entirety employing ratios computed only for a single year (in our case 2018), the ratio system of Bleier employs financial statement data from the current year 2018 as well as the two subsequent years (in our case the years 2016 and 2017). The variable profile contains the following six ratios: (i) Earnings before tax to market value of equity (market capitalization; in case no market capitalization is available, it is proxied by its book value) of two years preceding (2016), (ii) earnings before tax to sales of the preceding year (2017), (iii) earnings before tax to market value of equity (market capitalization; in case no market capitalization is available, it is proxied by its book value) of the preceding year (2017), (iv) debt capital to operating cashflow minus tax and already determined distributions of the current year (2018), (v) sales plus interest on debt to total capital (denoted by equity plus debt capital) of the current year (2018) and, (vi) current assets (including deferrals) minus short-term debt to total capital (denoted by equity plus debt capital) of the current year (2018). The values of the six ratios are weighted by their respective regression determinants, resulting in weighted values. Subsequently, the ratio-specific values are summed to the total score. We employ the absolute total score as a control variable.

Fifth, the ratio system of Weinrich (1978, 152-181) employs a variable profile that contains eight ratios: (i) equity to debt capital, (ii) cash and cash equivalents to total capital (denoted by equity plus debt capital), (iii) monetary current assets (denoted by current assets plus accruals, minus inventory and long-term receivables) minus short-term debt, divided by operating expenses excluding depreciation, (iv) earnings before interest and tax to total capital (denoted by equity plus debt capital), (v) sales to total capital (denoted by equity plus debt capital), (vi) debt capital to operating cashflow, (vii) debt capital minus monetary current assets (denoted by current assets plus accruals, minus inventory and long-term receivables) to earnings after tax and, (viii) accounts payables plus bills of exchange payable to purchases of goods (denoted by materials expenses plus unfinished and finished goods). According to the values of the ratios, scores are denoted to all eight ratios employing a rating scale, and subsequently a total score is computed by summing up the ratio-specific scores. We employ the absolute total score as a control variable.

3. Experiments and Results

The goal of this study was to test the relevant hypothesis, whether banks should invest into environmentally sustainable companies, since they are supposed to be treated as “safer” investments. We performed experiments with two dependent variables, namely ROI and ROE. The original sample population was 1,392 company observations. After dropping incomplete datasets, the regressions were run on reduced sample populations of 947 company observations for the return on investment and 959 company observations for the return on equity. Although reducing the sample negatively affects robustness of the results, considering fundamental econometric premises, we conclude the sample populations to be still exceptionally high. The regressions were done by classic multivariate OLS regression modelling. Testing the respective key assumptions, we conclude the results to be sufficiently robust, thus assuring an excellent foundation for recognizing characteristics of companies’ environmental sustainability. At the beginning of the experimental work, we incorporated numerous alternative (individual) financial indicators. However, later experiments employing the composite financial variables indicate that the composites (as reported in

Table 1) outperform the alternative (individual) financial indicators in our regression models. This is in accordance with fundamental econometric theory, since many individual and parceled variables often cause multicollinearity as well as other problems related to the robustness of model’s results. By using composite financial indicators, we (i) ensured the elimination of multicollinearity and (ii) introduced many individual variables indirectly by a single indicator into the model.

Rationally, we expect a negative sign for the ‘CLIMATE_SCORE’ variable. A higher climate score indicates a lower environmentally sustainable company. Thus, the higher the negative climate score regressor, the higher the positive effect on financial performance in terms of both: the return on investment and the return on equity. The key finding of both regression models is that climate score positively affects the financial performance of companies. The prefix of the ‘CLIMATE_SCORE’ explanatory variable has a negative sign for both, return on investment and return on equity models. This coincides with rational expectations, since a negative sign positively affects the financial performance of an environmentally sustainable company, and vice versa.

Table 1: The two regression models with regression and statistics results.

Variable	Dependent Variable: ROI			Dependent Variable: ROE		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
C	16.707	14.339	***	40.171	9.643	***
CLIMATE_SCORE	-0.226	-3.171	***	-1.109	-3.858	***
ALTMAN_Z_SCORE_TOTAL	0.369	8.780	***	0.511	3.117	***
BLEIER_SCORE_TOTAL	0.788	8.204	***	2.072	5.632	***
QUICKTEST_TOTALSCORE_2018	-5.449	-15.883	***	-11.715	-9.322	***
QUICKTEST_CHANGE_TOTALSCORE	2.672	3.304	***	n.a.		
S_B	-2.084	-2.147	**	-12.301	-3.190	***
S_C	-1.456	-3.177	***	-4.992	-2.828	***
S_G	-1.949	-2.176	**	n.a.		
DEVELOP	-0.947	-1.950	*	n.a.		
R-squared	0.416			0.164		
Schwarz criterion	6.598			9.386		
Log likelihood	-3.090.076			-4.476.788		
F-statistic	74.035		***	31.030		***
Adjusted R-squared	0.410			0.158		
Akaike info criterion	6.547			9.351		
RESET Test (F-statistic):	2.448			2.521		
Durbin-Watson stat	1.737			2.155		
Sample (adjusted)	1,392			1,392		
Observations (after adjustments)	947			959		
Method	OLS			OLS		

*** indicates below 1 % level of significance, ** indicates below 5 % level of significance and * indicates below 10 % level of significance. Variables ‘S_B’, ‘S_C’ and ‘S_G’ indicate dummy variables according to the NACE Rev. 2 industry classification representing ‘Mining and Quarrying’, ‘Manufacturing’ and ‘Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles’, respectively. ‘CLIMATE_SCORE’ is the primary variable of interest, while the remaining variables are control variables.
Source: Authors’ calculations.

For both regression models, the R-squared indicator is relatively low. This may be explained by two factors: First, we are using cross-section data and, second, our experimental goal is to find out the relationship between the environmental/sustainable awareness of companies and their financial performance. Thus, we do not struggle to perfectly indicate financial performance. The Ramsey's RESET test F-statistic result was not significant on the 10 % level of significance, while the models of both, return on investment and return on equity scored significant F-statistics of overall significance. Being common for regression models in finance research, the residuals deviate from normality (normal distribution). However, the large sample population ensures reliability of the results. Additionally, we have verified the robustness of the results by alternative estimators being insensitive to the assumption of normality of residuals, showing no larger deviations.

4. Conclusion

Conducted research in this paper was motivated by two questions: (1) what is the effect of environmental sustainability to financial performance of companies, and (2) does the indicator of environmental sustainability carry any useful information for banks when these decide about diversifying their investments. The results obtained disclose exceptionally robust association between environmental sustainability and both key indicators of financial performance, i.e. ROI and ROE. Results indicate that climate score indicator, as one of the characteristics of companies, may act as a valuable and beneficial tool to banks when deciding where to place their investments. Additionally, according to the shape of the model, the 'CLIMATE_SCORE' variable or an indicator of environmental sustainability, may play a crucial role at specifying the probability of default (PD) models as well. Although this was not a primary focus of the research, we have also shown that classical composite indicators of financial health of the companies, such as Altman z-score, Bleier ratio and others, may importantly contribute at explaining future financial performance of companies. Although we have not focused on the characteristics of companies and conditions in which companies operate in detail, the results show that these individual and parceled characteristics should be taken into account when modeling financial performance or probability of default models. We have included these characteristics by including the dummy variables on sectors or the country development variable. Still, there are many other such characteristics that affect how well the company will perform. Although, we conclude that based on the conducted research, using latest research data on a case study for Europe, we cannot

reject the underlying hypothesis. According to the results obtained, the environmentally sustainable companies indeed can show off as safer future investments for banks. As a potential future work, the list of the European companies could be extended to other countries. Additionally, few other dependent variables (financial performance indicators) could be exploited. Both potentials call for a more extensive database, which usually come at additional costs.

Although in this article we are evaluating financial consequences of companies' decision to go green, we have to be aware that to be successful such business model takes two parties. The endeavours of companies to include latest environmental standards and seek for green innovations will only bring positive financial effects when correspondingly accepted by their buyers' markets. It is understandable that the latter can be highly volatile, which goes back to the factors that are influencing their behaviour. Regarding green economy their response has been recently captured by the data on environment degradation caused by human economic activity. So, they tend to oppose the business style following just financial effects and neglecting the field of general concern – the environment degradation. So, within the scope of their risk analyses, banks might find it useful to apply instruments of analysis of two additional factors contributing to a financial effect of their investment in green companies. The first one would be the judgement to what extent the production of certain goods and services is prone to dynamic development of public judgement and thus prone to changes – thus representing a kind of hidden risk for investors (for literature review please see Gualandris and Kalchschmidt (2014)). The second one refers to the green company's consistency in public relations (for the literature review please see Okay et al. (2020)). In the word of pluralism of media their success with this activity could essentially influence their market position and thus financial effect of the bank's investment.

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Risk-return-impact: A new paradigm to fight climate change

*Andrea Montanino, Alberto Carriero and Laura Recagno**

Over the past two decades, the frequency and magnitude of the climatic events affecting the planet has grown exponentially. Therefore, the fight against climate change and the transition to a low-carbon economy are factors that the international community can no longer ignore in order to intercept a path of sustainable development. The Covid-19 pandemic has further heightened the perception of the fragility of the current economic paradigm, emphasizing the need to deeply innovate ways to promote growth.

In this perspective, an unprecedented involvement of national governments and international institutions is needed to create a more favourable context for a green and sustainable development. Hence, it is equally essential that economic and financial actors radically review the rules of engagement and the criteria for investments evaluation, promoting a new approach focused on a risk-return-impact paradigm.

JEL O44 Q54

1. Climate change in the time of Covid-19

The Covid-19 pandemic has dramatically highlighted the fragility of the global economic and social context. Within a few weeks, the spread of the virus caused a symmetric supply and demand shock that is unprecedented in recent history.

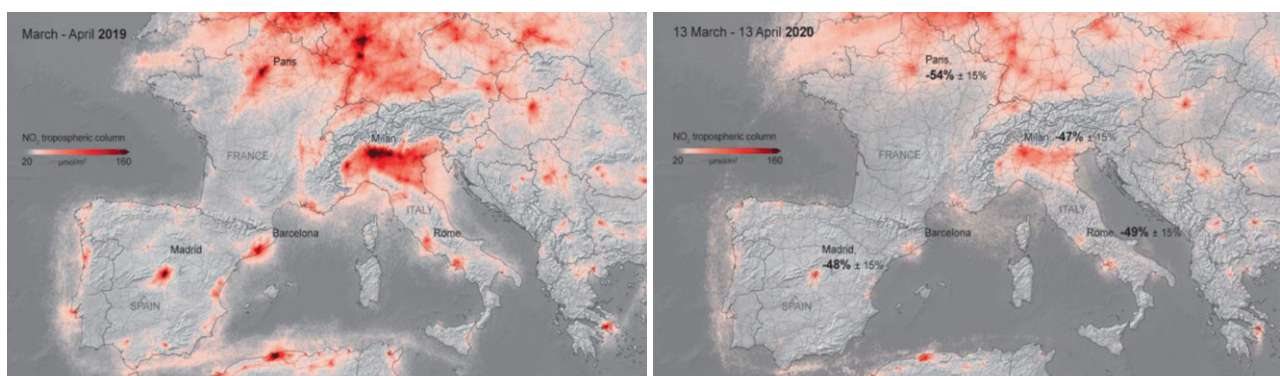
Closure of borders, disruption of global supply chains, collapse of national health systems and drastic contraction in the levels of economic activity: the storytelling of the emergency quickly moved from the comparison with the financial crisis of 2008-2009 to that with the effects of the Second World War.

The Covid-19 pandemic has become the emblem of the black swan: "First, it is an outlier, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility. Second, it carries an extreme impact. Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence after the fact, making it explainable and predictable"(Taleb, 2007).

So unexpected and unpredictable that it has not been considered among the potential risks against which to be

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Figure 1 – Air pollution over Europe, 2019-2020



Source: European Space Agency

protected by the main economic agents at the international level. As highlighted by the Global Risk Report of the World Economic Forum, the last time the pandemic risk appeared among the top 5 risks in terms of potential impact dates back to 2008. Moreover, in the last fifteen years it has never been listed among the main risks in terms of likelihood (World Economic Forum, 2020).

At the same time, the main international insurance companies showed that at the beginning of 2020 only one insurer had a product dedicated to pandemic risk in its portfolio and that only one economic operator made use of it (Ratliff, 2020).

As a by-product of the months of lockdown, there has been a drastic decrease in Greenhouse Gas (GHG) emissions. In March and April, for example, some of the main European cities recorded air pollution levels 45%-50% lower with respect to the same period last year (figure 1) (The European Space Agency, 2020).

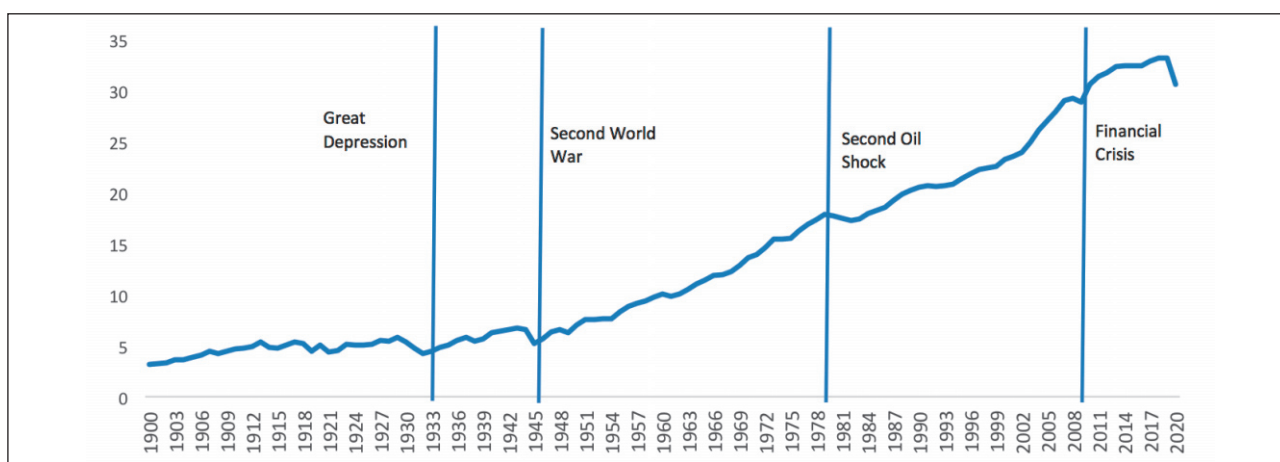
In 2020, the slowdown in economic activity and the drastic reduction in the movement of goods and people are likely to determine a 2.6 billion tons reduction of CO₂ emissions (-8% with respect to 2019). It would represent not only the

most significant reduction in the dynamics of greenhouse gas emissions in history, but also the annual cut needed to limit global warming to below 1.5°C (graph 1) (IEA, 2020). According to the International Energy Agency (IEA), such a reduction would be six times larger than the previous strongest one (0.4 billion tons) recorded in 2009 due to the financial crisis (graph 2).

However, it is not possible to imagine that a series of pandemics is needed to bring the planet on a trajectory of abatement of emissions. Moreover, this does not mean a transformation towards a carbon-neutral economy but rather a series of shocks to the economies without structurally changing the way energy is produced and consumed. At the same time, the efforts towards the economic recovery, if not accompanied by more stringent climate measures, could lead to a new acceleration of emissions, undermining the benefit on climate change of the past months.

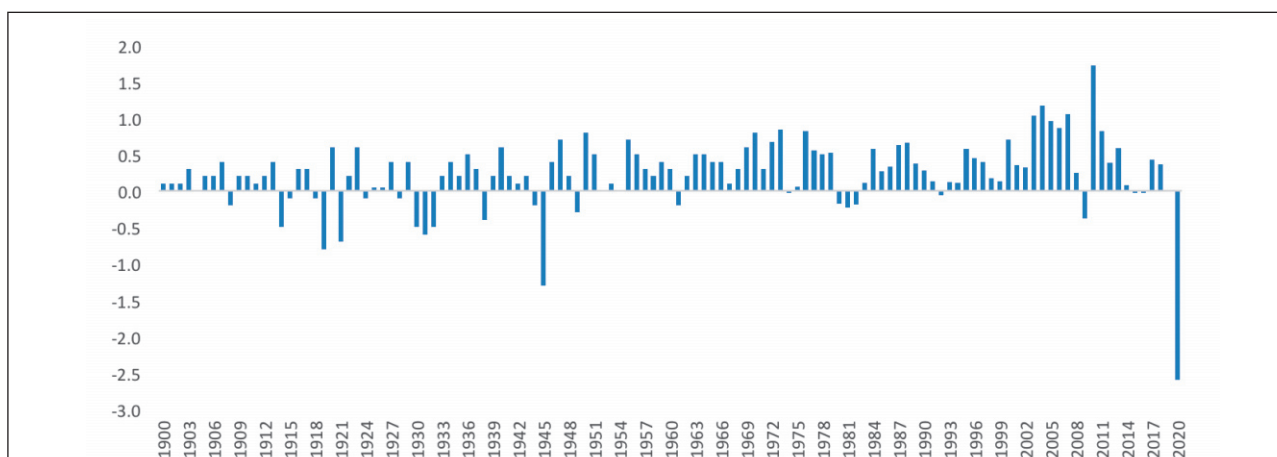
The challenge, therefore, is to trace a path of development that manages to combine growth and environmental sustainability, expansion of economies and reduction of emissions. In two words: sustainable development. To this end, the EU agreement concerning the Recovery Fund goes in the right

Graph 1 – Global energy-related CO₂ emissions, 1900-2020 (Gt)



Source: IEA

Graph 2 – Annual change in global energy-related CO₂ emissions, 1900-2020 (Gt)



Source: IEA

direction because it aims at boosting the EU economy while accelerating the green transition. It is a once-in-a-life opportunity.

2. The path towards sustainable development: managing climate change related risks

After more than twenty years of Conferences of the Parties (COP), the path was clearly traced in Paris in 2015 within the framework of COP 21: "to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;

b) Increasing the ability to adapt to the adverse impacts of

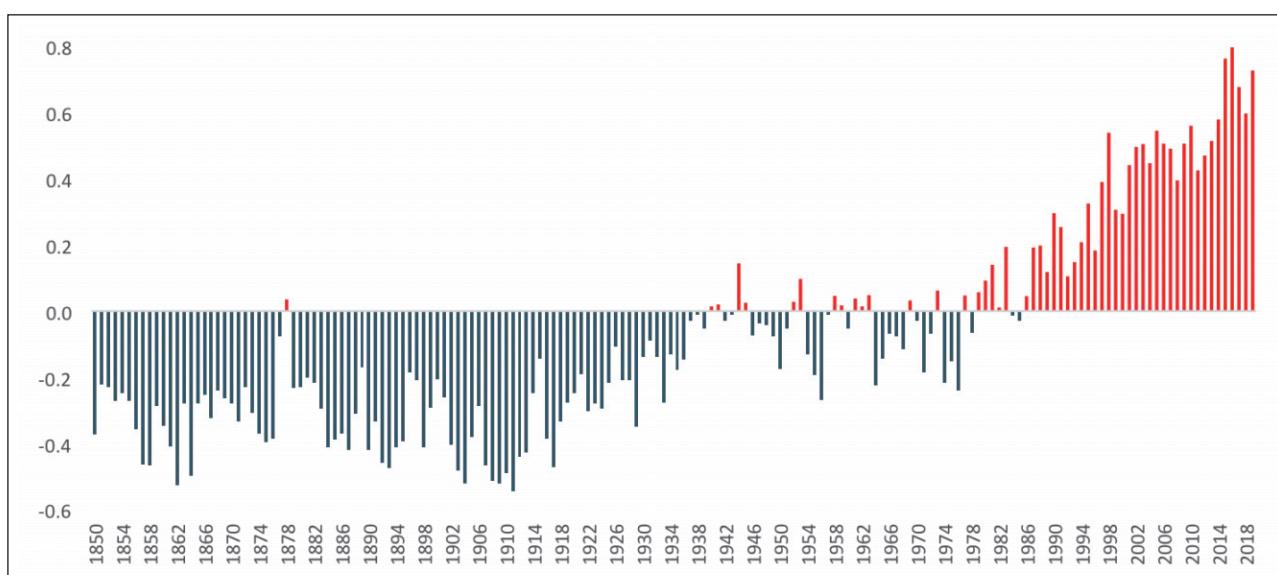
climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and c) Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development" (Paris Agreement, 2015).

The horizon of the action is well defined: no later than 2050 to achieve carbon neutrality.

In fact, although scientific studies show that the planet is subject to very long-term climatic changes independent of anthropic activity, it is clear that an unprecedented acceleration has started since the industrial revolution with an increase in average temperatures to an estimated level of 1°C higher than those of the pre-industrial era¹ (graph 3).

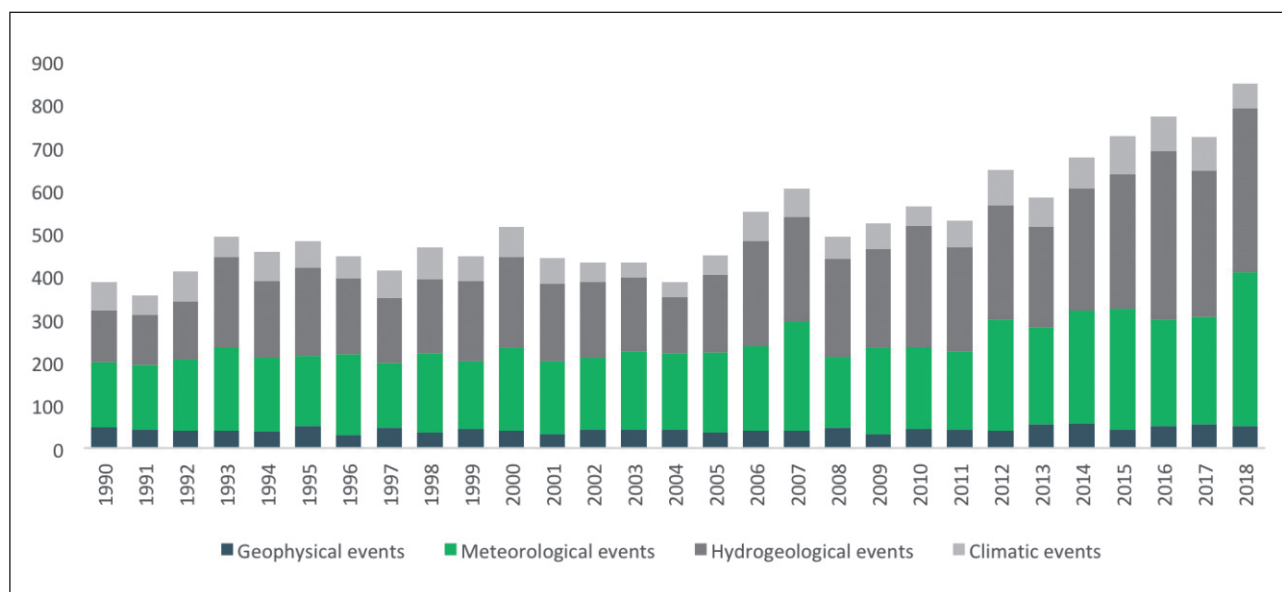
¹ The Special Report "Global warming of 1.5 °C" published by the IPCC (Intergovernmental Panel on Climate Change) in 2018 estimates that human activities caused global warming of around 1.0 °C compared to pre-industrial levels, with a confidence interval between 0.8 °C and 1.2 °C.

Graph 3 – Global temperature anomalies (°C)



Source: CDP on Climatic Research Unit data, University of East Anglia

Graph 4 – Relevant natural events (n.)



Source: CDP on Munich RE, NatCatSERVICE data

Alongside this, extreme climatic phenomena are growing in number and intensity, with increasingly significant impacts in terms of both loss of life and damage to economies and territories. In the period 1990-2018 over 15 thousand catastrophic events of a geophysical, meteorological, hydrogeological and climatic nature occurred, with the death of over 1.5 million people. Overall, estimated losses over the period totalled over \$ 4,200 billion².

In this context, the awareness of the international community has significantly grown, and a debate has matured on how to identify and manage climate change associated risks³.

Today a wide set of analysis explains the link between climate change and the financial system. Three main risks can be identified:

- **Physical risk.** It includes the potential adverse effects on economic actors which are exposed to extreme natural events. For example, environmental disasters can lead to the destruction of physical capital that households, companies and public institutions are forced to rebuild. This can affect the level of indebtedness, compressing the resources available for consumption and investment and further aggravating the ability to generate income. These mechanisms affect the financial sector through various channels. On the one hand, natural disasters disrupt the activities of companies and households; on the other hand, they lead to a reduction of value of assets given as collateral to obtain credit. Furthermore, environmental shocks could increase the number of non-performing loans in the banks' portfolios exposed to companies or households located in the areas where the shocks take place.

As a consequence, financial institutions could restrict the supply of credit, potentially affecting the effectiveness of the monetary policy. In the most severe cases, the stability of the entire financial system could be threatened.

- **Transition risk.** It originates from the commitments made by the international community to achieve the objectives set by the Paris Agreement. An ungoverned transition to a low-carbon economy could sharply reduce the value of energy reserves and infrastructures related to the exploitation, transformation and use of fossil fuels. Unlike the physical one, the transition risk could seriously affect the stability of the financial system. In fact, given the importance of the energy sectors, a

² The data processed by Munich RE take into account natural events that have resulted in the loss of at least one human life and / or have caused damage in excess of 100 thousand, 300 thousand, 1 million or 3 million dollars depending on the income class assigned by the World Bank to the individual country concerned.

³ Among the main actions in this direction, it is worth mentioning: a) the establishment in 2015 of the Task Force on Climate-related Financial Disclosure (TCFD) by the Financial Stability Board (FSB); b) in 2016 that of the Green Finance Study Group (GFSG) in the G20 area; and c) the establishment by the European Commission of the High Level Expert Group on sustainable finance (HLEG). The HLEG report was the starting point for the related Action Plan to finance the sustainable growth of the European Commission which led to the definition of a common taxonomy for sustainable investments adopted by the European Parliament on 18 June 2020. The Taxonomy Regulation provides a definition of "environmentally sustainable" economic activities. An economic activity is environmentally sustainable if it makes a "Substantial contribution" to one of the following six specified environmental objectives: 1) climate change mitigation; 2) climate change adaptation; 3) sustainable use and protection of water and marine resources; 4) transition to a circular economy; 5) pollution prevention and control; and 6) protection and restoration of biodiversity and ecosystems. An economic activity is environmentally sustainable if it also does "no significant harm" to any of those six environmental objectives. In December 2017, a group of Central Banks and Supervisory Authorities set up the Network for Greening the Financial System (NGFS) in order to promote the sharing of experiences and best practices in the management of risks related to the environment and climate change affecting in the financial sector.

sudden drop in the value of reserves and related infrastructures could trigger a race to sell the stocks of energy companies with consequences that could permanently affect the path of global economic growth. Furthermore, the energy transition could exert inflationary pressures, promoting more expensive alternative energy sources or introducing carbon pricing systems that influence prices and economic activity. Finally, since the demand for energy is inelastic in the short to medium term, a sharp increase in energy prices would increase the financial vulnerability of companies and households due to the resources needed to purchase the energy goods.

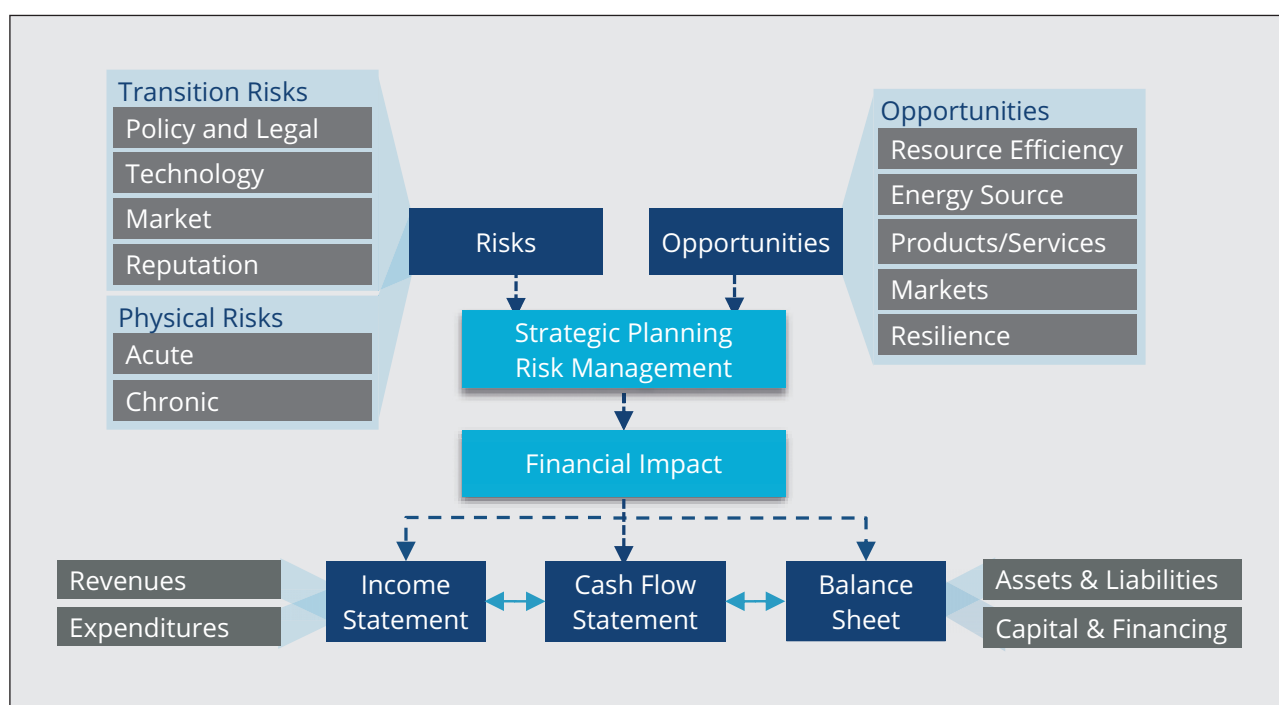
- **Liability risk.** It arises when those who have suffered losses caused by climate change seek compensation from those who have taken on such risks by profession: insurance companies. Recent estimates suggest that there have been close to 1,000 climate change related class action lawsuits filed in nearly 40 countries (Sabin Center for Climate Change Law, 2020). Lawsuits are creating concerns for companies' insurers who can suffer three types of losses: an increase in claims related to the failure to mitigate, adapt or disclose climate risks; a reduction in asset value if they also invest in these companies; and litigation from policyholders who believe their insurers failed to fulfil their fiduciary duty to construct climate-resilient asset portfolios (Brown, Nyce, 2019).

3. "The time is out of joint", a new paradigm is needed: risk-return-impact

"The time is out of joint" (Shakespeare) and the window of opportunity to contrast and mitigate climate change is narrowing. Since our concern is not just the complex succession to Denmark throne but the sustainable development of the world economy as whole, a significant response to those rising risks should come soon. Climate change is not just a near future event that governments, institution and communities should care about, but it is an ongoing crisis showing its effects nowadays. Any delay leads to greater costs in the future. And we cannot wait for another pandemic to slow down emissions.

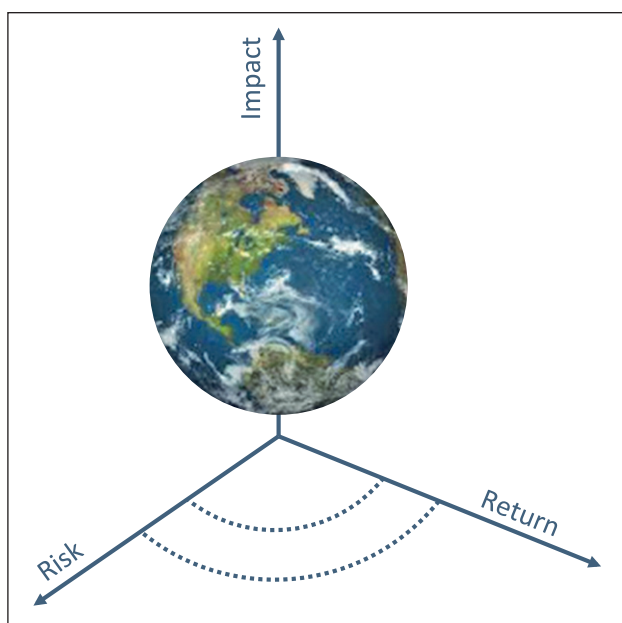
Unlike poor Hamlet, our generation has not discovered the crime thanks to a surreal ghost, we are instead witnessing the climate change scene right now. Then, it is crucial that the way we invest as well as the way we compute risks consider both environmental and sustainable issues. A new paradigm is needed. Traditional evaluation tools are no longer adequate for current challenges; therefore, it is necessary to integrate the classic risk-return model with an extra dimension: the impact (Figure 3). As in the 19th century investors pursued returns and their 20th century successors learnt how to consider together risk and returns, it is now time to embrace impact in the financial scheme. In other words, when evaluating investments, it is necessary to take into adequate consideration not only the economic and financial sustainability of business plans and projects, but

Figure 2 – Climate change related risks, opportunities and financial impact



Source: TCFD

Figure 3 – The paradigm shift



Source: authors' elaboration

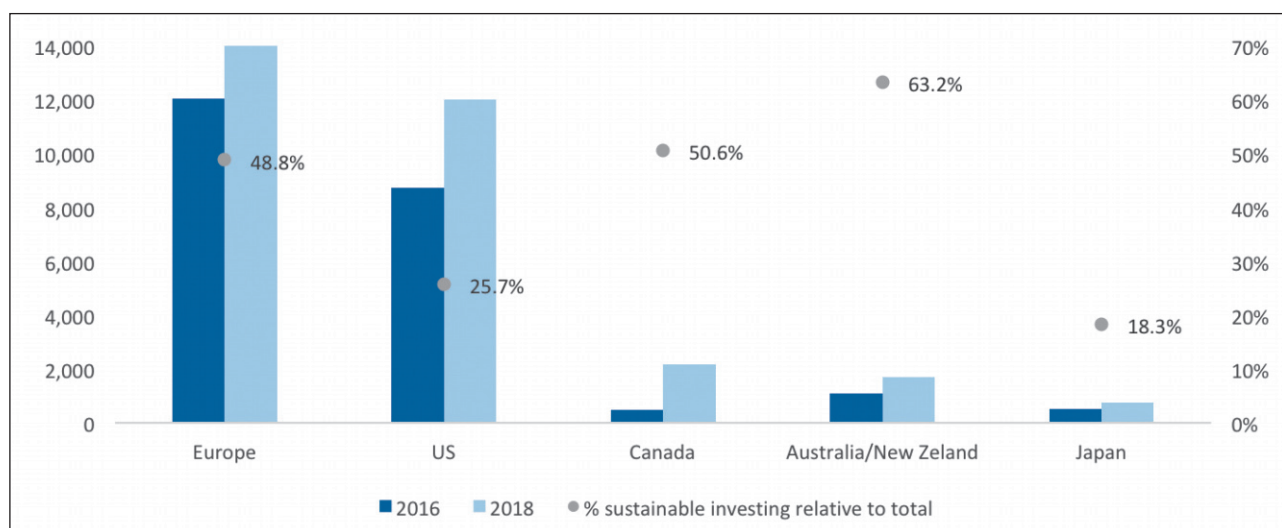
also the long-term environmental and social impacts of the initiatives, according to consistent and measurable metrics. The revolution consists in aligning interests of governments together with business and consumers in the direction of a sustainable future (Cohen, 2018)

In this context, the shocks that the Coronavirus crisis has triggered might be an opportunity for rebalancing portfolio components in a green finance perspective. Therefore, the attention to the environment could drive the recovery (BlackRock, 2020) and as said by BlackRock Chief Executive Officer, Larry Fink, in his annual letter, investors are finally recognizing climate risk as investment risk, hence a reallocation of capital is soon expected (Fink, 2020).

Investing responsibly is not a complete novelty in finance. Some examples exist, from the socially responsible bonds of late '90s to the more recent concept of environmental, social and governance (ESG) investments. The latter has led to the so-called sustainable investing approach, or ESG integration, which seeks to maximize the risk return scheme paying attention to ESG related issues (IFC, 2019). Defining the market size of ESG investments and a possible market for impact is still challenging since there is uncertainty about what can be strictly included in this category. However, regardless the method, there is a raising interest in sustainable investing. At the beginning of 2018, global sustainable investments accounted for over 30 trillion dollars in five major markets. Europe represents the major leader with sustainable investments exceeding 14 trillion dollars, that represented almost 50% of the total investing (graph 5) (Global Sustainable Investment Alliance, 2018).

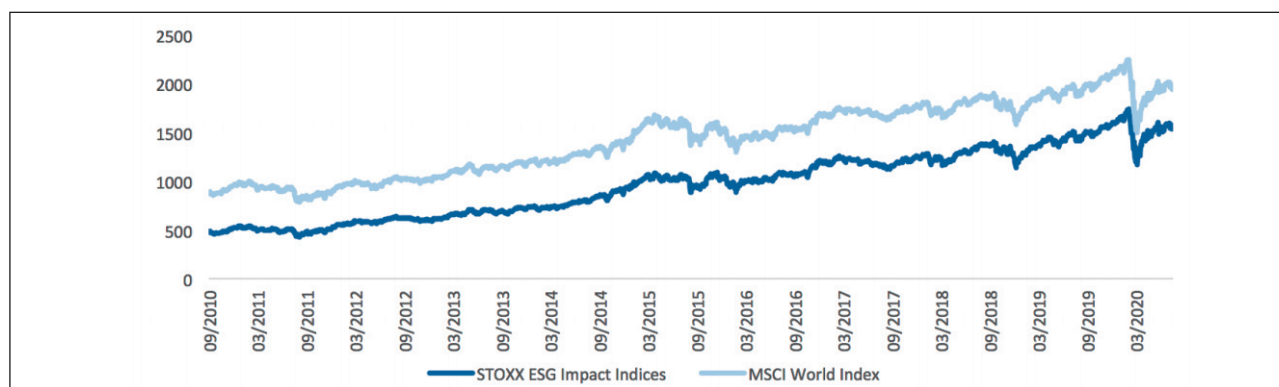
Sustainable investing has been the exhibition of an increasing *intent* of investors so far, but actual *contributions* and a clear methodology to *measure impact* are still missing (IFC, 2019). Impact assessment must rely on (i) quality (ii) consistency and (iii) time relevance of data given by societies themselves (Forum per la finanza sostenibile, 2017). Measuring impact is the new financial challenge that we must overcome, as we learnt how to compute risk, we can now get a standardize methodology that makes impact comparable, consistent and transparent to a large audience. Once investors could get aware of impacts then sustainable business would be awarded by more resources, creating a virtuous cycle that links profits and positive impact, lowering the long-term financial risk.

Graph 5– Sustainable investments by region (billions, US\$)



Source: Global Sustainable Investment Alliance, 2018

Graph 6 – Performance of ESG index versus MSCI World Index, over the last decade



Source: Thomson Reuters, 2020

Investing in ESG is already profitable, showing returns that mirror and get closer to the classic market indices over time (Graph 6). If the third dimension of impact were considered, the positive externalities triggered by the ESG investments could be embedded in their specific value. On the other hand, the negative externalities as well as the transactions risk implied by non-sustainable oriented investments would lead to a lower return. In this scheme, the benefit of impact-investments would finally appear straightforward to every stakeholder.

Why is this paradigm shift crucial? The *impact revolution* could represent a leverage to close the financial gap of total annual investments in Sustainable Development Goals (SDGs) relevant sectors. Developing countries still need an amount that ranges between \$3.3 trillion to \$4.5 trillion indeed, that means an annual financing gap of about \$2.5 trillion between actual resources and what is required to meet the goals (IFC, 2019). Converging both private and public sector on sustainable investing could therefore achieve a win-win equilibrium.

4. Conclusions

A successful paradigm shift depends on a collective effort made by all stakeholders involved. Impact measurement should be incorporated in all decisional and computational process, becoming a *new normal* driver of sustainable investing. Insurers should further integrate the climate change risk in the present and future computations, developing instruments more capable of adaptation and resilience. In order to avoid an adverse selection and educate communities, insurers should develop an incentive methodology for rewarding ESG positive impact. Investors should follow their ESG oriented *intent* by rewarding those investments that produce and promote higher impacts. Thanks to a clear *data impact maps* they could orient themselves and become educated about climate change implications.

Regulators and banks could promote sharing of information based on credibility, they should provide guidelines and toolkit that make private sector capable of risk awareness as well as impact conscious.

Finally, a strong cooperation is required among governments in order to set a common strategy and be able to pursue it at all stakeholders' level.

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How Circular is Slovenian Economy?

*Manca Jesenko, Klemen Košir, Damjan Kozamernik and Polona Lah**

In line with the EU long-term objectives Slovenia aims at reaching climate neutrality of its economy by 2050 at the latest, meaning net-zero greenhouse gas emissions. Transition to a more circular economy will be an indispensable instrument to achieve this ambitious goal. Scaling up circular transformation from current frontrunners to the largest part of the economy possible is therefore one of the main policy objectives, to which SID banka, as national development bank, endeavours to contribute by providing targeted financial support. This note provides early evidence on how circular Slovenian economy is by applying SID banka's circularity evaluation framework to a sample of firms from its credit portfolio. It finds that only around 40% of firms can currently be classified as applicants of circular business models, but, on the positive side, there seem to be concentration of circular business models in segments of the economy where it is most needed. In examining how circularity relates to business performance the evidence indicates little positive effect, if any, suggesting that up to now linear business models have not been subject to relevant environmental constraints.

JEL G14 G21 G28

Introduction

As a recent report by the World Bank states, the current use of nonrenewable natural resources is unsustainable and these resources could eventually be depleted (Lange, G.-M., Wodon, Q., Carey, K., 2018). This calls for a fundamental change in principles and concepts in organising economic activity to preserve the environment and implement a more sustainable system. One of the main principles aiming at reorganising the economy towards achieving sustainability is circularity. The Ellen MacArthur Foundation, a leading global foundation in this field, with Slovenia being its member, defines it as follows: “circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems”. The main aspect of circular economy is decoupling of economic growth from use of natural resources and its negative environmental impact.

A transition to circular economy potentially requires a great deal of investing, change and effort. Nevertheless, Slovenia can also benefit significantly from transitioning to circular economy, not least because its main economic advantages are not reserves of rare natural resources and its economic wellbeing is not dependent on selling

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mineral resources. These benefits include the creation of new profit opportunities, reduced costs due to lower virgin-material requirements. Furthermore, by mitigating waste and pollution, keeping products and materials in use, the transit from linear to circular business models could contribute a decisive part in tackling the climate challenges. This note aims at providing some early evidence on how circular Slovenian firms actually currently are and whether this has mattered in their business performance. First, a sample of firms, applying for a loan at SID banka, was evaluated against the relevant sustainability elements, among which was circularity of their business model. Sample results were extrapolated to match the Slovenian economy by applying appropriate weighting. The second part of the note evaluates possible linkages between the firm's business model circularity and the firm's medium-term business indicators. Some implications of the results are summarised in the final section of the note.

Assessing business model sustainability and circularity

To encourage circular transformation of the Slovenian economy and to better understand this process, SID banka designed its own circularity assessment tool at a firm level (Giacomelli, Kozamernik and Lah, 2018). It involves a 5-scorecard evaluation tool based on a financial score which assesses a long-term business model resilience and competitiveness, further combined with four sustainability aspects of its business model: the raw materials scorecard, environmental scorecard, energy efficiency

scorecard and innovation scorecard. The structure of the tool, using an appropriately selected subsample of 12 among all 53 questions in addition enables for an evaluation of the current degree of circularity and its capability for circular transition.

The analysis is based on a sample of 170 firms that applied for a loan from SID banka in the period from mid-2018 to February 2020 and were assessed using the 5-scorecard evaluation tool. The participants' scores by the 5-scorecard evaluation tool are ranged on the spectrum from -100 (negative value indicates negative sustainability business model) to +100 points. The mass of the distribution is concentrated around the interval from -10 to +10 and its shape seems to resemble to a normal distribution with a slight skew; there are slightly more companies that perform worse than the distribution mode (Chart 1). Interestingly, dividing data relative to firm's size makes apparent a noticeable disparity, with medium and especially large firms being located on the far right of the distribution, thus performing far better in terms of sustainability scores. Looking at the five scorecards separately unveils quite irregular distribution patterns, as shown in Charts 2-6. While medium and especially large companies perform better on all 5-scorecards, vast majority of their advantage over smaller competitors actually comes from the financial and innovation scorecard. Nevertheless, the charts with distribution of firms by scores, especially energy scorecard, but also environmental and raw materials scorecards, show that most of the firms are in the negative territory in those sustainability aspects.

Chart 1: Distribution of firms by scores from 5-scorecard framework

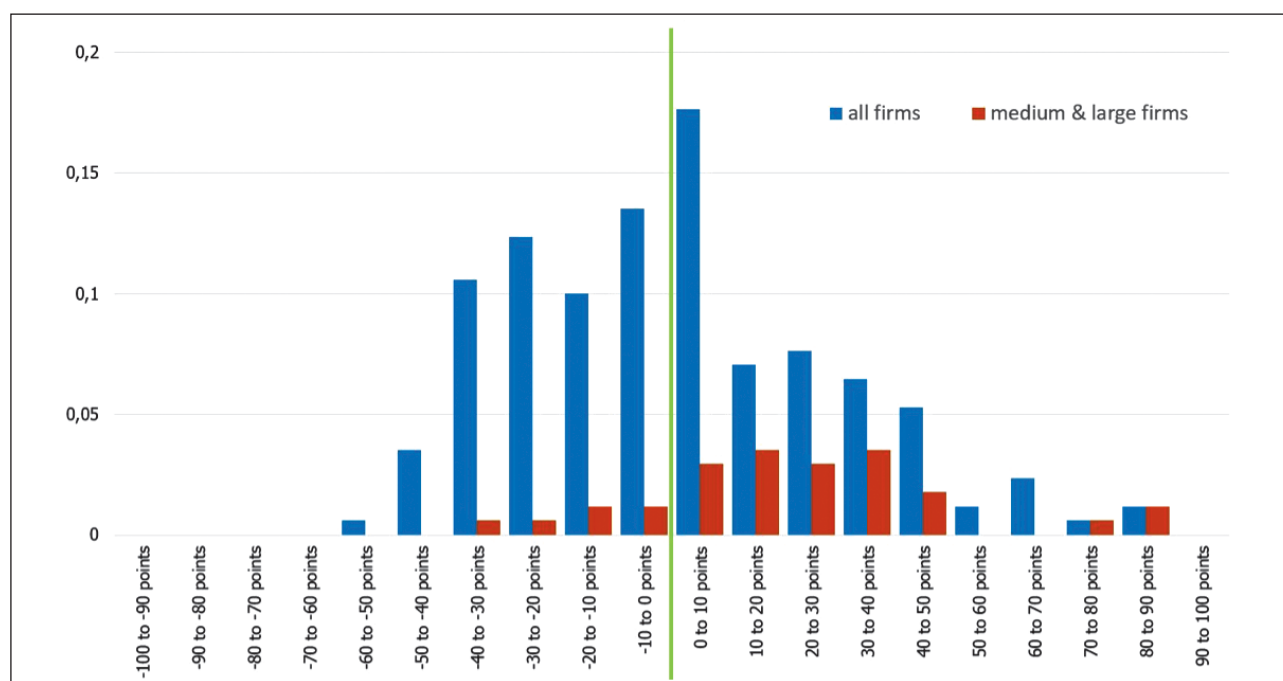


Chart 2: Financial balance scorecard distribution

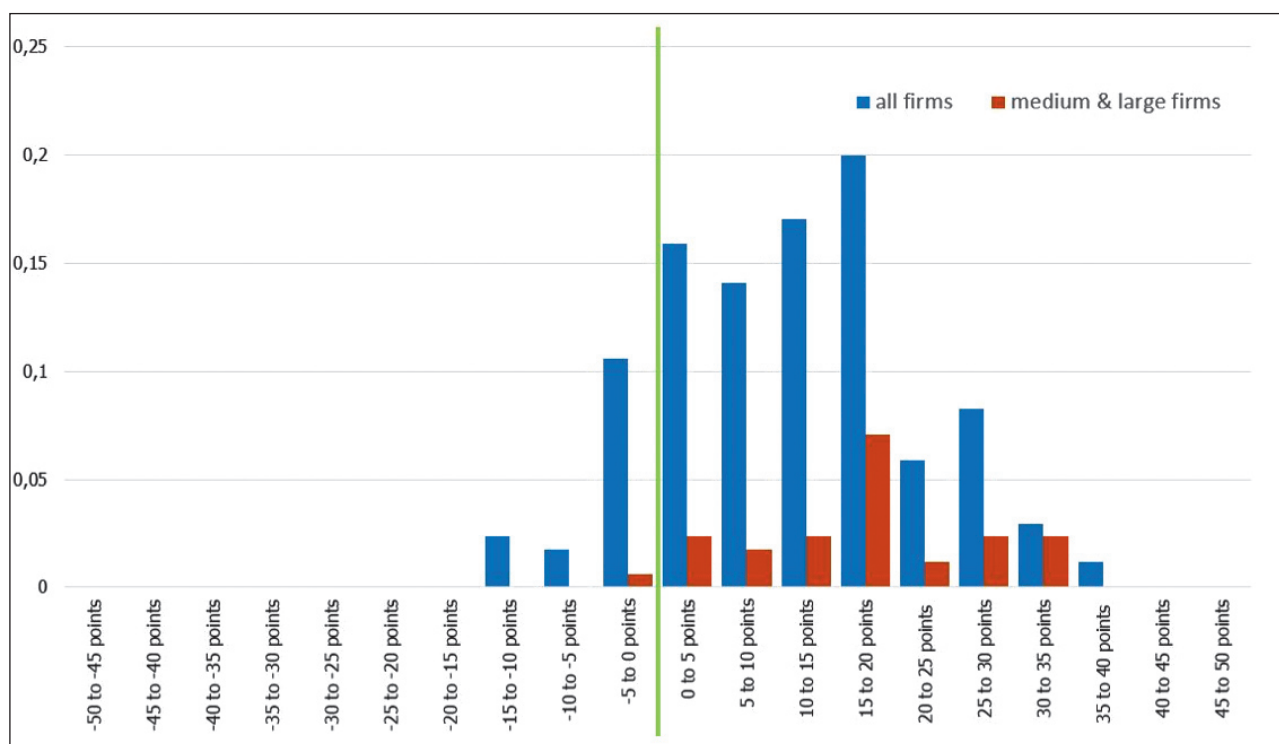
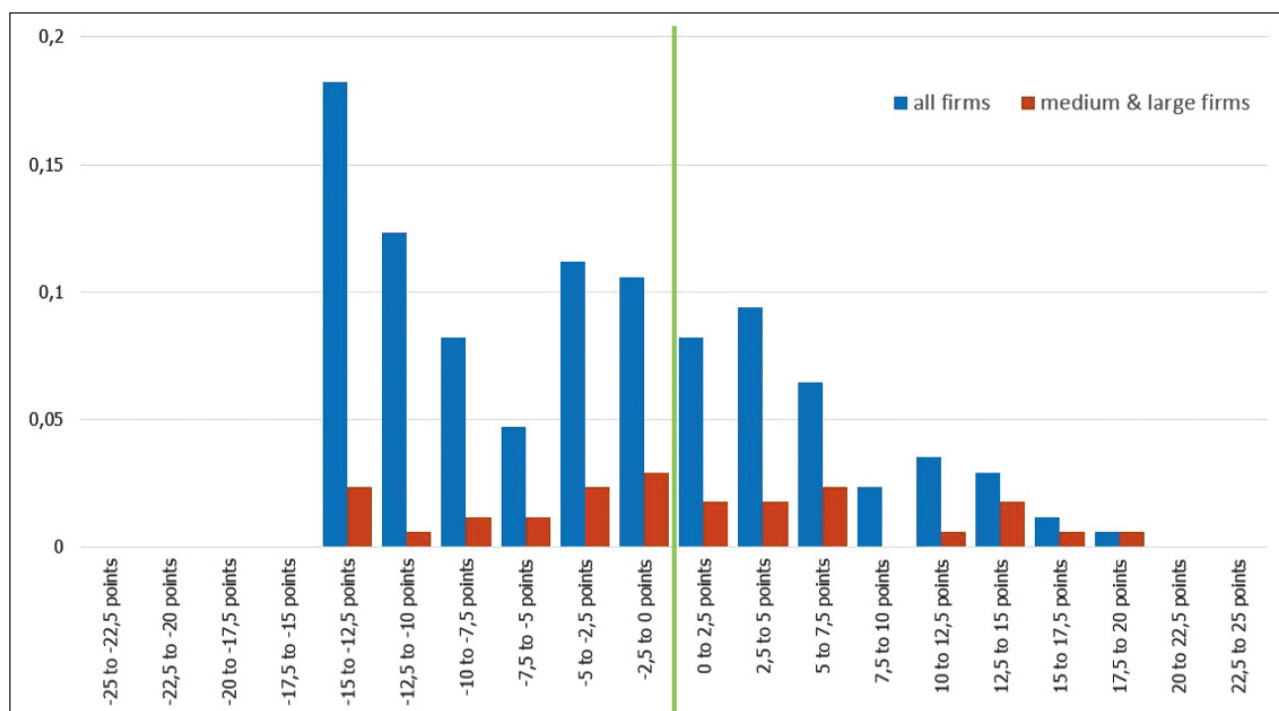


Chart 3: Raw materials scorecard distribution



The level of circular orientation and capability for circular transformation

The twelve circularity-assessing questions are divided in two dimensions, one related to the level of circular orientation of the firm and the second related to the firm's capability of the transition into a circular economy. A more detailed analysis (not integrated in this note) indicates that the two

circular orientation aspects most commonly being integrated into the business model are the consideration of circular principles in the process of designing a product (esp. modularity, renewability, degradability, input reduction) and in the process of selecting suppliers along with setting terms and circular requirements. Most of the circular transformation capability emerges from the technology

Chart 4: Environmental scorecard distribution

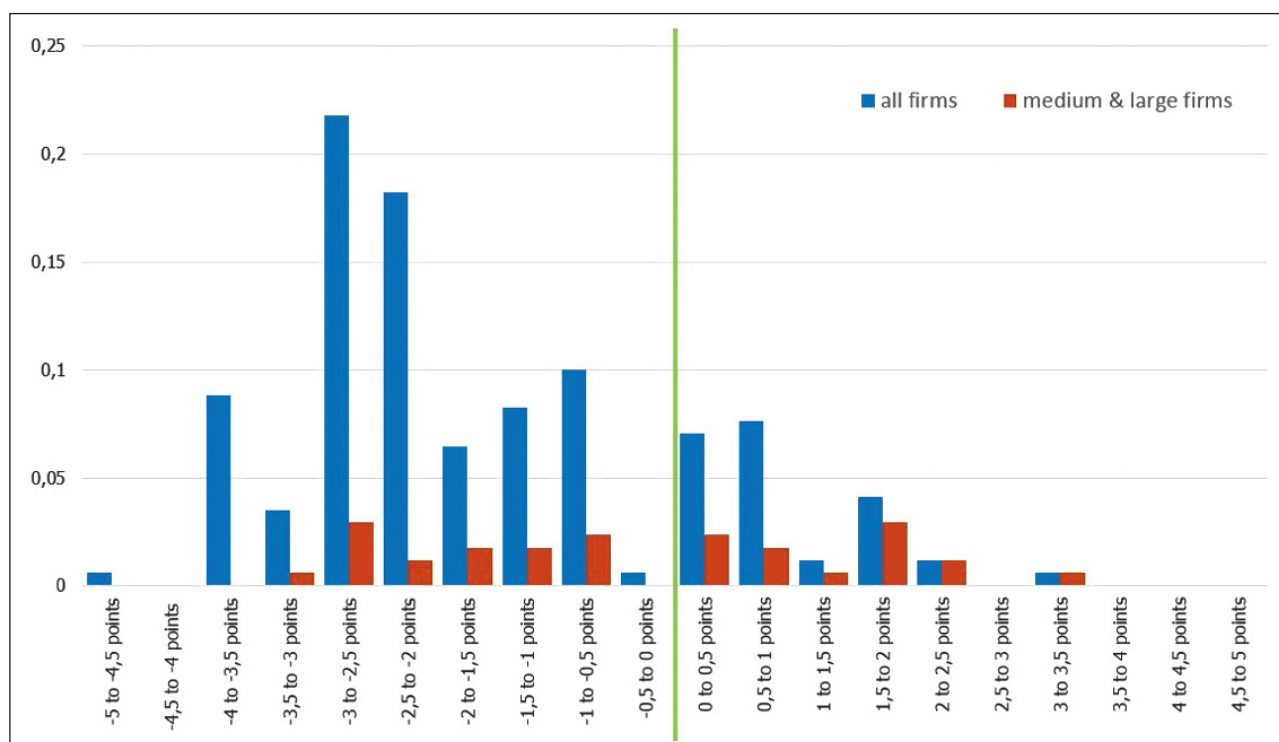
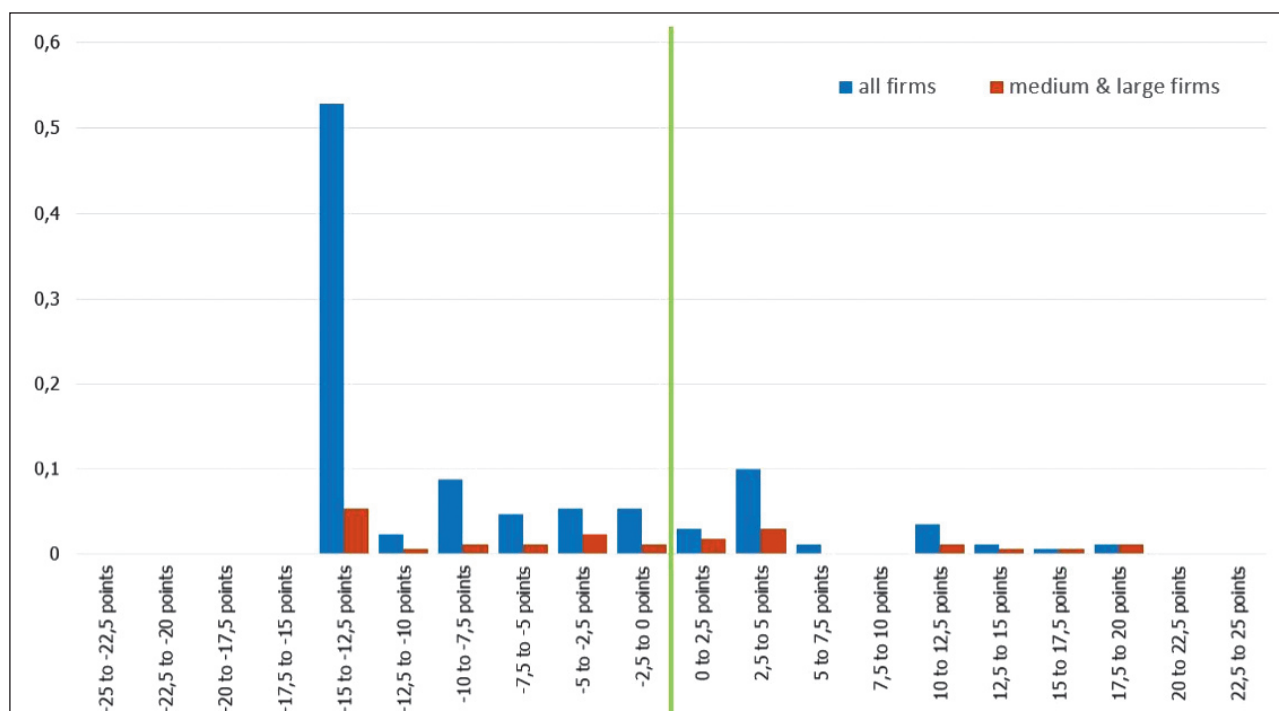


Chart 5: Energy scorecard distribution



capacity, some of the firms also elaborated a documented plan for integration of circular principles in their business processes.

Chart 7 shows the dispersion of the firms in the sample according to circular orientation and circular capability. It is immediately obvious that all the companies with the weakest capabilities for circular transition also do not have

high levels of circular orientation. The Spearman's correlation coefficient¹ for all the units in the sample between the level of capabilities for circular transition and levels of circular orientation is 0,66, which indicates a relatively strong correlation between the two variables. Since the sample is

¹ Spearman's correlation coefficient shows the correlation even if the relation between two variables is not linear.

Chart 6: Innovation scorecard distribution

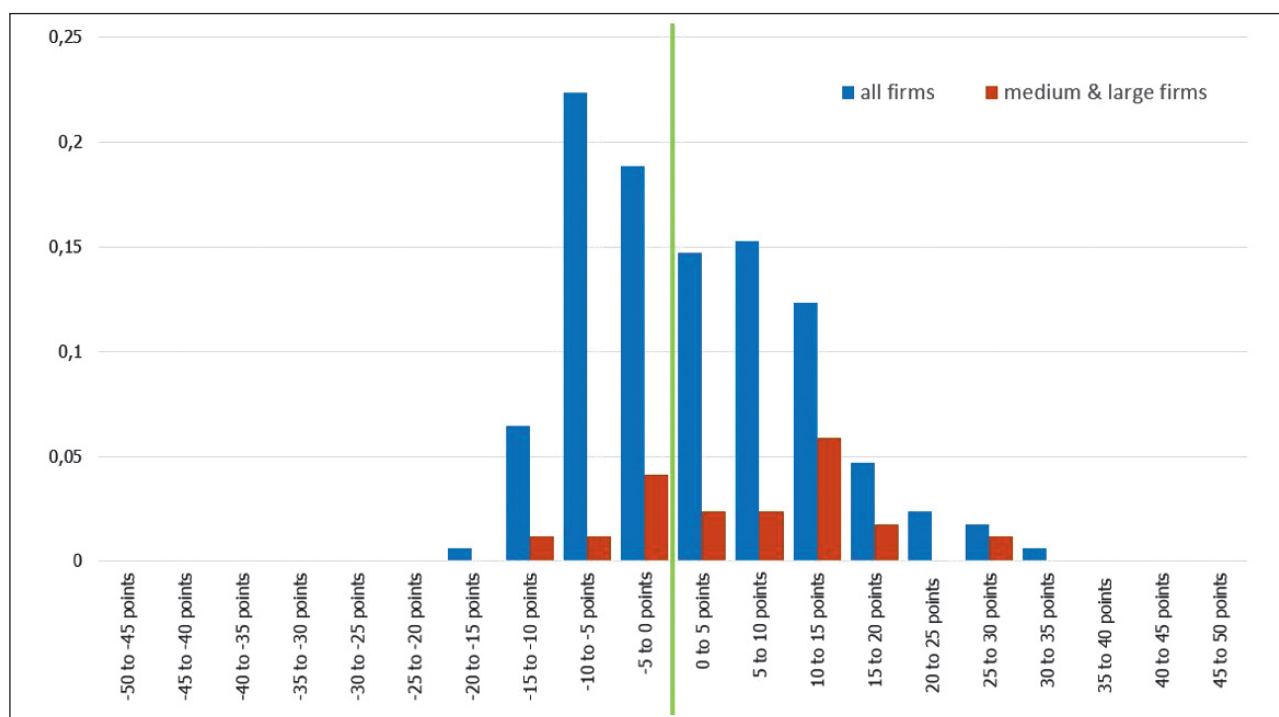
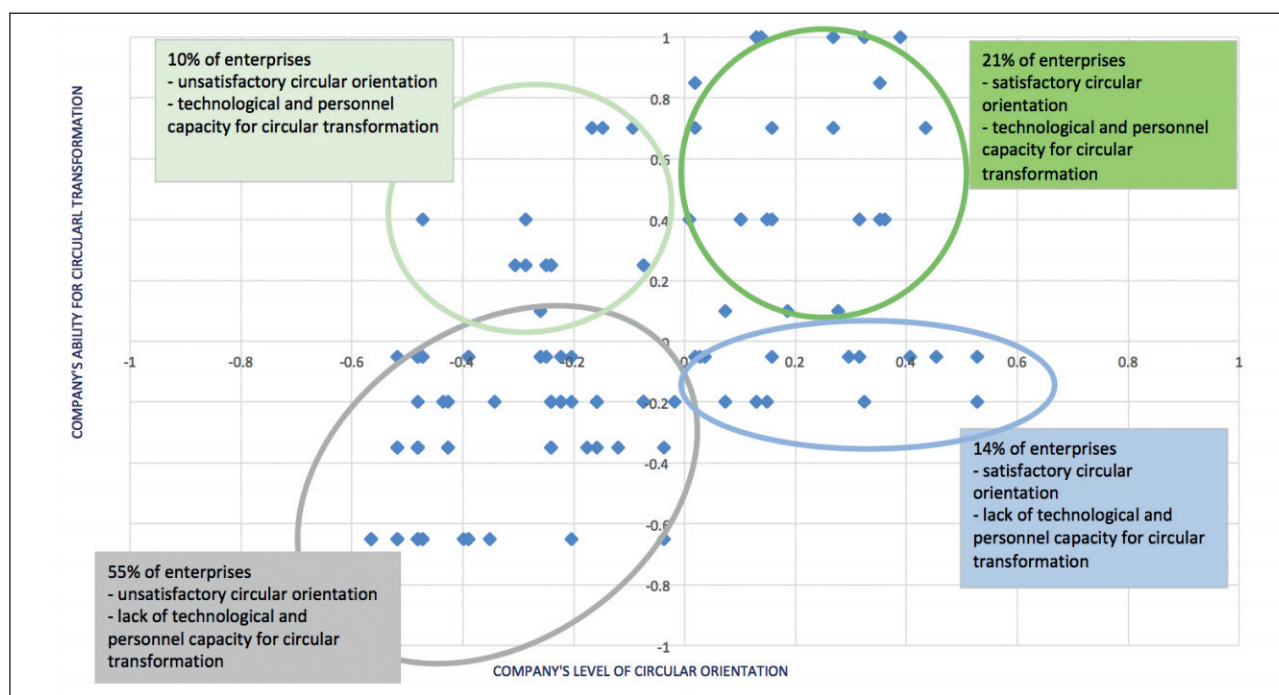


Chart 7: Circularity of a business model, identified groups.



Source: SID banka

divided into four distinct groups determined by these two dimensions, it is not surprising that the groups containing units with one of the variables considerably more prominent than the other only contained a small proportion of the sample. The group containing companies with both satisfactory level of circular orientation and technological and human capital resources for circular transformation –

labelled as circular frontrunners, represents 21% of firms. Expectedly the largest group is on the other end of the spectrum – 55% of firms are attaining unsatisfactory level of circular orientation and at the same time lack capacity for circular transformation. The group containing firms with only satisfactory technological and human capital resources for circular transformation holds 10% and the

Table 1: Population-weighted structure by size and industry (weights determined by employment and production sector)

		circular frontrunners	in circular transition	circular latecomers	Linear business model	→ of which: strictly linear business model
		11%	19%	15%	55%	30%
size	micro	10%	22%	16%	52%	31%
	small	13%	7%	8%	72%	31%
	medium	41%	8%	17%	34%	9%
	large	34%	0%	50%	15%	6%
sector	construction	1%	83%	3%	13%	5%
	industry	16%	14%	24%	46%	13%
	commerce	2%	1%	40%	57%	47%
	services	17%	15%	1%	67%	33%
	- transport & catering	4%	2%	0%	94%	10%
	- other services	20%	18%	1%	61%	39%

group with only satisfactory level of circular transformation holds 14% of firms. The group in the bottom right on the chart is missing a technological and/or human capital for completion of the transformation, is in transition. The group in the upper left quadrant of the chart has the capability but lack the circular orientation, is labelled as circular latecomers.

The extrapolation of the circularity characteristics from SID banka sample on the population of Slovenian firms gives an overview of the circularity in relation to some business characteristics. The portion of firms with linear business model is almost on the same level as the one from SID banka's sample (55%). However, the extrapolation significantly decreases the portion of circular frontrunners from 21% to 11% and puts more firms into the circular transition group, resulting in the increase from 10% to 19%. This is mainly because the share of large and medium-sized firms in the sample. Results indicate that two sectors with the most evident supply side potential for circular change – construction and industry – stand out in terms of circularity. It is estimated that transition of heavy industries, such as cement and construction, steel, aluminium and plastic production, to circular economy, can cut GHG emissions by 56% by 2050. The other two sectors, commerce and services, show a low level of the circularity.

The obtained results may correspond to the international study of some circularity aspects (mainly exploitation of recycled materials and waste management) by Olga Giannakitsidou, Ioannis Giannikosa and Anastasia Chondroub: *Ranking European countries on the basis of their environmental and circular economy performance: A data envelopment analysis application in Municipal Solid*

Waste. Their findings suggest that Slovenia is at the top of newer EU members as regards a noticeable integration of circular principles. Interestingly, Slovenia also substantially outscores many old members such as France or Spain.

Is circularity of business models aligned with business performance?

Going forward from the circularity assessment, this section aims at providing some early evidence on whether circularity can be in some way related to business performance. To examine differences between circularity groups of firms in terms of business performance a set of indicators of business success are selected: value added per employee, labour cost per employee, profit margins, ratio between financial debt and EBITDA, EBITDA in operating revenue and level of equity in total assets of the company. Note that these are all indicators designed for measuring success in a traditional linear business economy. To avoid focusing on firms' performance in a potentially too narrow point of time, a range of medium-term growth indicators were added to complete the above list of indicators, i.e. five-year average growth rates in value added, employment, value added per employee, operating revenues, investments and five-years change in equity share.²

As the group of companies with mostly linear business models encompasses the majority of the sample, we narrowed it down to those with strictly linear business to make the potential differences more evident. A special "extreme linear" group has been created. It includes companies that not even partially meet the listed circular

² In case the enterprise has not existed for that long or the data were not available, the reference period was adjusted – shortened.

Table 2: Frontrunners vs. linear model companies.

Frontrunners vs. linear model companies	circular frontrunners	strictly linear model companies	p-value	the rest of the linear business model companies	p-value
value added/employee	45,717	33,799	0.005	43,688	0.741
equity/assets	38%	34%	0.198	36%	0.391
labour costs/employee	24,614	20,63	0.005	21,76	0.042
profit margin	6%	3%	0.042	4%	0.123
financial debt/EBITDA	2.5%	3.30%	0.047	3,6	0.020
EBIDTA/operating revenue	13%	7%	0.000	10%	0.064
Employment	25	11	0.004	11	0.003

Source: SID banka

principles. By concentrating these limiting cases 37 companies with strictly linear business model are obtained, 22 percent of the whole sample. The groups of circular frontrunners and those with strictly linear business model are therefore of the same size.

The results of the between-groups comparison are presented in Table 2, showing t-tests³ for the two groups examined. The main conclusions of the test for the static indicators are statistically quite conclusive; circular frontrunners in the sample are on average larger and more developed firms, with lower indebtedness and (therefore) affording to pay better wages. Not only are differences between groups substantial (e.g. 33,799 EUR of value added per employee in the group of strictly linear model firms being less than three quarters of that in the group of circular frontrunners, 45,717 EUR, and profit margin being twice as much for circular frontrunners as attained by strictly linear model firms) but also the level of statistical significance shown by the p-values assure that this differences are significant and not random for all the categories except for the ratio between equity and assets, where though circular frontrunners perform better, the difference is statistically not significant.

Similarly favourable values for circular frontrunners arise from the comparison of credit ratings of firms with respect to their circular orientation. Table 3 shows the cumulative distribution of credit rankings among the selected groups of firms. Circular frontrunners display more than ten percentage points higher cumulative density up to the investment grade rating (BBB) and BB rating. More than a fifth of circular frontrunners have at least single A rating, while this ratio is less than one tenth in other groups.

Moving from static indicators to those measuring trends, the evidence of positive correlation between circular orientation on positive business performance largely fades

Table 3: Cumulative distribution of ratings in different groups

	circular frontrunners	strictly linear business model	the rest of the linear business model companies
AAA	4%	0%	0%
AA	13%	0%	2%
A	21%	9%	6%
BBB	42%	27%	30%
BB	75%	61%	70%
B	96%	94%	94%
C	100%	100%	100%

away, as shown in Table 4. Circular frontrunners lag behind other groups in most of the compared indicators, albeit nowhere is the difference in values statistically significant. This evidence of no effects of circularity of business models on firms' business performance should not surprise nor disappoint. In our interpretation circularity is statistically positively correlated to business performance for some non-causal reasons. The lack of positive relationship in trend indicators is clearly suggesting that other structural forces prevail over circularity in explaining the business performance of firms (such as a simple reversion to the mean, a standard maturation of firms as they grow larger, comparative advantages – interestingly, as shown in Table 5 circularity strongly correlates with the innovation score (and, obviously, the financial balance score) at the firm level. One could also interpret the statistical relationships identified as resulting from reverse causality – mature and better performing firms may have on average lesser further potential to improve their business performance and at the same time higher incentive or willingness to enhance circular aspects of their business model. Or, eventually, in a

³ Inferential statistic used to determine if there is a significant difference between the means of two groups.

Table 4: Frontrunners vs. linear model companies, trends.

Frontrunners vs. linear model companies	circular frontrunners	strictly linear model companies	p-value	the rest of the linear business model companies	p-value
Growth of value added	0.31	0.36	0.620	0.32	0.928
Growth of employment	0.25	0.28	0.663	0.25	0.968
Growth of value added/employee	0.05	0.08	0.643	0.07	0.731
Growth of operating revenue	0.28	0.37	0.342	0.48	0.534
Growth of investment	0.48	0.71	0.173	0.23	0.517
Growth of equity	0.40	0.57	0.193	0.63	0.336

Source: SID banka

more pessimistic view, better performing firms that invest in circularity have been (temporarily) impaired by doing so. The identification of circular effects on business performance and risk therefore requires controlling for other relevant factors determining firms' business performance. The data at our disposal is not (yet) sufficient for a more complete econometric analysis along these lines, but a step forward can be done by controlling for levels of business indicators in trend regressions, i.e. controlling for convergence (regression to the mean – low value indicators tend to increase faster and high value indicators tend to slow down) a one of the relevant idiosyncratic explanatory factors of a growth in particular business indicator. Regressions shown in Table 6 apparently strongly confirm this hypothesis, as shown by highly significant negative signs of the coefficients related to the level of the indicators. Still, the effect of circularity remains modest – while regressions now consistently indicate a positive impact across all selected performance indicators, this impact is in no case statistically significant.

Looking ahead

The early evidence in this note, based on a sample of 170 firms that applied for financing in SID banka, indicates that

around 40 % of Slovenian firms run business models mainly consistent with the principles of circular economy. Linear business models may account for roughly 30 % of firms. According to scarce available international evidence this is comparable to other advanced economies. There is a fair amount of diversity in circularity of business models related to firms' characteristics, such as their size or sector in which they operate. Circular business models are

Table 6: regression of the growth in selected performance indexes on its level and firm's circularity

growth	const.	level	circularity
DV_zap: koef	2.503	-0.227	0.002
DV_zap: p-val	0	0	0.11
DV: koef	1.215	-0.067	0.003
DV: p-val	0	0	0.212
zap: koef	0.325	-0.034	0
zap: p-val	0	0.04	0.947
place_zap: koef	3.041	-0.293	0.002
place_zap: p-val	0	0	0.225
prih: koef	0.675	-0.028	0
prih: p-val	0.015	0.132	0.843
inv: koef	2.115	-0.12	0.003
inv: p-val	0	0	0.289
kapital: koef	1.628	-0.091	0.001
kapital: p-val	0	0	0.558

Table 5: Average scores for different groups in different in each of the scorecard

	averages				
	circular frontrunners	strictly linear model companies	p-value	the rest of the linear business model company	p-value
Financial balance scorecard	17.9	4.7	0.000	7.5	0.000
Innovation scorecard	6.2	-7.4	0.000	1.3	0.027
Environmental scorecard	-2.0	-4.7	0.007	-4.2	0.036
Energy scorecard	-5.4	-12.7	0.000	-8.6	0.058

⁴ Raw materials scorecard is omitted as 5 out of 7 questions in forming groups are from this category, therefore calculating the differences would be pointless as they are selfimposed.

concentrated among larger firms and more industrial sectors, and less so in services sectors. It is important that circular business models are implemented where most needed, i.e. where negative environmental impacts are the most worrying. Early evidence provides some comfort in this respect since circular orientation is found to correlate with circular capacity. Further work shall examine in more detail which aspects of circularity at the firm level are relevant or lacking in this respect.

The evidence also seems to indicate that circularity is not yet impacting firms' business performance in a relevant way. Put differently, linear business models were up to now not constrained by environmental sustainability in any way that could have significantly affected their business performance. Therefore, there may be (to) little business incentives to internalize societal benefits in firms' transition to circularity. Nevertheless, this may (and should) drastically change

in a not so distant future – with likely unfavourable effects on circular laggards, constrained by shortages of raw materials, regulations or targeted taxation measures. More of proactive and progressive local and global policies should therefore foster transition to circularity, also by penalizing linearity, by directly or indirectly the impacting firms' business performance.

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EBRD supporting green economy transition projects

*Milan Martin Cviki**

The European Bank for Reconstruction and Development (EBRD or Bank) started supporting its private and public sector clients with a focused operational environmental and climate activity under the Sustainable Energy Initiative (SEI) in 2006. Since then, building on the support from its shareholders and upon demand from clients across its regions of operations this activity has expanded with the Green Economy Transition (GET) approach approved in 2015, enabling the EBRD to support some 40% project with GET driven objective in the last couple of years. As part of this the Bank developed sector's best GET practices. The EBRD now plans to align its activities with the principles of international climate agreements, including principally the Paris Agreement. In addition, the EBRD plans to enhance policy engagement for the development of long-term low carbon strategies of a particular country of operations, including greening of financial systems. EBRD would also scale up investments in the GET 2.1. approach in order to reach a green finance ratio of more than 50 per cent by 2025. The purpose of this paper is thus to present the EBRD's past experiences and future intentions that could be of interest for bankers in Slovenia and in wider region.

JEL E51 G28 Q54 Q58

INITIAL EBRD WORK ON THE SUSTAINABLE ENERGY INITIATIVE AND GREEN ECONOMY TRANSITION

The European Bank for Reconstruction and Development (EBRD or Bank) initiated a focused operational environmental and climate activity in 2006 with the launch of the Sustainable Energy Initiative (SEI) as part of its third Capital Resources Review covering the period 2006-2010. The EBRD addressed mainly energy efficiency and climate change projects including support to renewable energy and adaptation projects through its SEI from 2006 to 2015. The SEI was launched with the aim of scaling up sustainable energy investments in the Bank's region, now some 38 countries of operations (COOs). The aim was to improve the business environment for sustainable investments and help removing key barriers to market development of green type of projects.

As with other programs SEI used the full range of the Bank's financial instruments (from debt to equity instruments) to finance sustainable energy projects as well as to support energy efficiency improvements in the corporate sector, including the agribusiness, manufacturing

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and service sector. When market barriers were too high to allow projects to go forward, the Bank supported eligible clients by obtaining donor funds¹ from bilateral and global partners such as the Climate Investment Funds (CIF), the Global Environmental Facility (GEF), the European Union, and others.

SEI projects also benefitted from the Bank's ability to deliver technical assistance to its clients and governments. The Bank's technical assistance products includes market analyses, feasibility studies, energy audits, and training and awareness raising. Since EBRD is an IFIs with an emphasis on development, as part of Bank policy dialogue activities, the SEI also supported the development of strong institutional and regulatory frameworks that incentivise sustainable energy investments.

Building on the support from its shareholders and on demand from clients across its regions of operations, this SEI activity has expanded with the Green Economy Transition (GET) approach approved in 2015. The Green Economy Transition (GET)² approach is the Bank's strategy for helping countries where the EBRD works build low carbon and resilient economies. Through the GET approach, the EBRD have increased green financing above 40 per cent of its annual business volume before 2020. Note that by early 2020, the EBRD has signed €34 billion in green investments, financed over 1 900 green projects which are expected to reduce 102 million tonnes of carbon emissions yearly. In 2019 alone, the Bank financed over 2.2 GW of new renewable power capacity.

A Case for GET investments in EBRD Countries of Operation (COOs) and typeS of GET Investments IN COOs, INCLUDING IN SLOVENIA

Most of EBRD countries are low or middle-income economies in political, economic and social transition³ towards market economy. This implies many challenges, including global competitiveness, demographic change, and energy security. EBRD COOs are also carbon intensive and vulnerable to climate changes. The regions' carbon intensity is almost five times higher than the EU average, resulting in significant pressures on their environmental assets – including land, soil, water, air and biodiversity.

The GET approach builds on many years of EBRD experience in financing green investments, with an initial focus on

energy efficiency and renewable energy. The GET approach uses the full range of the EBRD's financial instruments. The Bank developed a range of dedicated programmes (Energy & resource efficiency, Circular Economy, Renewable energy, Climate resilience, Just transition) to promote green investments. It shall be reiterated that next to funding green investments, the EBRD worked closely with its COOs and private sector partners to create enabling environments needed for sustainable investments. As under SEI (and other operations) the EBRD work closely with multilateral donors and other bilateral donors to mobilise climate finance for our clients.

In this context the GET investments range from renewable energy projects in Egypt to energy efficiency investments in Ukraine's corporate sector. They also include interventions in sustainable transport in Eastern Europe, waste minimisation projects in Turkey, and investments that improve the climate resilience of our clients in Central Asia. More projects or their description in general can be found at <https://www.ebrd.com/work-with-us/project-finance/project-summary-documents.html> and for particular countries under particular part of the www.ebrd.com.

Next to initial projects, focusing on transition at large in Slovenia recently there were also couple of green projects. The most known and received a high award by the EBRD was an investment into new "furnace" in Salonit Anhovo. At the end sponsors have not withdrawn funds for it, as the Bank was not additional anymore. More recently in 2019 as part of Tier 2 capital support to the NKBM d.d. bank, conditions were set that NKBM d.d. bank shall invest proceeds into GET type of projects.⁴

One can only hope that more GET projects would be prepared and financing requested from the EBRD, as GET financing is one of the two strategic priorities of the 2019-24 EBRD Country Strategy for Slovenia.⁵ However, next to achieving GET transition criteria projects need to pass the market test (donor funds can help in project preparation) as well as the Bank' additionality tests, meaning that other either domestic or foreign commercial banks are due to tenure or size not able to provide full financing. In the most advanced COOs like Slovenia, the EBRD in general provide around 20–30% of necessary funding.

¹ In principle, it is one of major advantage of the EBRD to utilise donors' funds, which makes some projects marketable while ensuring necessary transition impact and this makes EBRD additional to other sources of finance.

² See more at <https://www.ebrd.com/what-we-do/get.html>

³ Note that since the most recent financial crisis the EBRD's transition concept argues that a well-functioning market economy should be more than just a set of markets; it should be competitive, inclusive, well-governed, environmentally friendly, resilient and integrated.

⁴ The Project supports (i) the Bank's Green Economy Transition ("GET") approach in Slovenia via NKBM allocating all EBRD funds towards funding certified commercial and residential projects, as well as renewable energy and energy efficient projects which meet the GET eligibility criteria and (ii) capital optimization of a systemic financial institution in Slovenia, in light of its winning of the privatisation process of Abanka and its further organic expansion. See more at <https://www.ebrd.com/work-with-us/projects/psd/50882.html>

⁵ See the EBRD's latest Slovenia Country Strategy at <https://www.ebrd.com/where-we-are/slovenia/overview.html>

GENERAL Results of GET 1.0 in period 2016-2019

In the run-up to COP21 negotiations, the EBRD set an ambitious target for GET1.0 to achieve a 40% GET ratio relative to its total annual investment by 2020. This represented a significant step-up compared to an average green finance ratio in the preceding five-year period of 28%. In my capacity of the former EBRD Board Official during August 2017-July 2020, I am pleased to emphasize that the EBRD reached, and even exceeded, the target GET ratio path for each year between 2016 and 2019. The GET ratio reached 43% in 2017 and even 46% in 2019. Cumulative GET EBRD finance for this period was €15.0 billion, up 42% compared to €10.5 billion in the previous four years. Climate finance accounted for 94% of overall GET finance including projects with other environmental co-benefits. In line with the Bank's operating model, the average private sector share of GET finance was 59%. For these results the strong support of multilateral and bilateral donors was provided when needed.

Let it be noted by bankers and project sponsors that the Bank established a specific GET assessment process including the GET Clearing House and the GET Handbook.⁶ The GET Handbook explains GET Finance Qualification Process, Qualifying Principles and Criteria as well as Eligible Project Categories and shall be reviewed in details as part of project preparation. It is a good starting point in preparing the project proposal, as in project concept review phase, projects are judged against set criteria and principles.

The EBRD also lead by example and thus the Bank also assessed more systematically and comprehensively climate related financial risks across the Bank's portfolio. As reported in successive Sustainability Reports, the EBRD has been carbon negative over each year of the GET1.0 period with the carbon balance between projects with net positive emissions and carbon emissions reduction projects estimated at a negative 11.2 million tonnes CO₂. Since 2018, the Bank has been a carbon neutral institution, abating the GHG footprint of its internal operations by purchasing carbon credits.

GET 2.1 APPROACH FOR THE PERIOD 2021-25 AND GREEN ECONOMY DEFINITION

In order to step up its GET work, the EBRD prepared in 2020 the new EBRD Green Economy Transition (GET) approach for the period from 2021 to 2025. After intensive months of preparation and weeks of deliberation at the

Board's bodies in early July 2020 the Bank has unveiled an ambitious plan to scale up even further its climate and environmental finance and its work supporting a green, low-carbon and resilient future.

As stated in its Press Release⁷, the EBRD is now considering a goal of devoting over 50 per cent of its annual investments to the green economy by 2025. In addition to the aim of making more than 50 per cent of its financing green, the plan would target specific emission reductions over the next five years and set a date for a decision on when all the EBRD's projects are aligned to the Paris Climate Agreement. The GET 2.1. plan forms part of the EBRD's overall strategy (so called Strategic Capital Framework, see footnote 2 above) for the next five years and will become effective with this strategy, due for approval by shareholders at the Bank's Annual Meeting, scheduled for 7-8 October, 2020.

The plan to become a majority green bank by 2025 builds on success in the past five years, during which the average green finance ratio rose to above 40 from 25 per cent. The scaled-up approach (GET 2.1) defines clear action areas to support a green economic recovery in its regions of operations taking account of the impact of the Coronavirus pandemic. This is in line with the basic idea of the EU that the new recovery and resilience program shall be based under green growth.

Under GET 2.1, the EBRD would also step up policy work to ensure its 38 emerging economies can effectively achieve climate and environmental goals. It would scale up investment by innovating across a set of specific environmental and climate mitigation and adaptation thematic areas such as greening the financial sector and energy systems, industrial decarbonisation, sustainable cities, food systems and connectivity, and natural capital preservation. In developing these thematic areas, particular attention would be given to just transition, gender considerations, circular economy opportunities, green digital solutions and the role of energy efficiency.

As climate change mitigation is a key GET 2.1 objective, the Bank would seek to achieve cumulative greenhouse gas (GHG) emissions reduction of 25 to 40 million tonnes per year by 2025. The EBRD would screen all investments for alignment with the Paris Agreement and national climate-related action plans, taking into consideration the priorities set in country and sector strategies. It would also increase its capacity to support countries, regions and sectors to develop low carbon and climate resilience strategies and scale up its efforts to mobilise climate finance.

⁶ See more at: <https://www.ebrd.com/Search.html?srch-term-user=GET+Handbook&srch-term=GET%2520Handbook&srch-pg=srch&srch-type=all&pg=1&sort=relevant>

⁷ See more at <https://www.ebrd.com/news/2020/ebrd-unveils-proposal-to-be-majority-green-bank-by-2025.html>

It was also agreed that the EBRD would work towards full alignment with the Paris Agreement, on which a decision would be taken no later than 2022. In preparing this decision lessons learned from the initial phase of implementation of the methodology jointly developed by the Multilateral Development Banks.

The enhanced GET 2.1. approach responds to the priority placed on supporting the acceleration of the transition to a green low carbon economy. The 'Green Economy' concept continues to provide the basis for a comprehensive and consistent approach grounded in the Bank's business model and building on its track record. Based on an examination of definitions of the green economy, and taking account of its mandate and operating principles, the EBRD defines the 'Green Economy' as follows:

A green economy is a market economy in which public and private investments are made with a specific concern to minimise the impact of economic activity on the environment and where market failures are addressed through improved policy and legal frameworks aiming at accounting systematically for the inherent value of services provided by nature, at managing related risks and at catalysing innovation.

KEY OBJECTIVE OF GET 2.1. APPROACH AND GET 2.1. POLICY APPROACH

The EBRD will in general support the acceleration of the transition to a green, low-carbon and resilient economy by:

- aligning its activities with the principles of international climate agreements, including principally the Paris Agreement;
- enhancing policy engagement for the development of long-term low carbon strategies and greening of financial systems; and
- scaling up investment by innovating across a set of specific environmental and climate mitigation and adaptation thematic areas such as green digital solutions, just transition, circular economy, natural capital and green value chain financing.

Delivered through the Bank's private sector oriented business model, this new approach will include climate action to reduce energy and carbon intensity and to enhance resilience to climate risks, as well as environmental action to abate air pollution, address water issues and protect natural capital.

The GET2.1 policy approach builds on GET1.0 seeking to integrate a long-term perspective formulated through broad stakeholder engagement with a clear definition of objectives and intermediate milestones, in line with SDGs and

consistent with broader climate and sustainability goals.

In addition, the GET 2.1 policy approach should also take into account system-wide impacts and the broader socio-economic situation, emphasising client ownership within a robust framework of accountability and implementation arrangements.

In this context the EBRD would continue to identify specific opportunities that emerge in its COOs in the context of its project work and relationship with governments and clients. Attention will be provided to support COOs in developing policy and regulatory frameworks. The formulation of policies at individual COO level takes into account local conditions and include consideration of international climate and environmental conventions and treaties to which each country is a party. The format usually includes long-term low-carbon and climate resilient strategies (LTS) and other national environmental plans including Nationally Determined Contributions (NDCs).

GET 2.1. AND FINANCE AT LARGE AT EBRD REGION

For bankers at large, it shall be noted that a significant area of potential systemic policy impact is related to the greening of the financial system which can have a particular impact in scaling-up environmentally sustainable private finance. There is growing awareness amongst financial markets, regulators and policymakers of the systemic threat that climate change poses to economic activity across all sectors and all geographies.

Central banks and financial supervisors in particular have identified this as a potentially major source of financial instability and are beginning to set expectations on how financial and non-financial firms should assess and manage climate-related risks in their portfolios and operations as set out for example by the Task Force for Climate - related Financial Disclosures (TCFD) and by the Network for Greening the Financial System (NGFS).⁸ Progress in mainstreaming climate change considerations into financial supervision and the functioning of financial markets includes the assessment, management and disclosure of climate-related risks and opportunities by both financial and non-financial firms alike.

The EU has already launched a comprehensive and ambitious policy framework for orienting the EU financial system towards low-carbon and climate-resilient sustainable development, in the form of the European Green Deal and the Sustainable Finance Action Plan under the Capital Markets Union. Under these initiatives, the European Central Bank and the European Supervisory Authorities (ESAs) are roll-

⁸ See more at [https://www.ngfs.net/en/Network for Greening the Financial System](https://www.ngfs.net/en/Network%20for%20Greening%20the%20Financial%20System)

ing out strategies for mainstreaming climate and other sustainability issues, including disclosure requirements, into their supervisory activities. That would certainly have effect on situation in Slovenia and regional financial markets, but it is for other contributors to this Journal to present those.

It is important to note that local capital markets can play a crucial role in enabling the green transition by allocating capital where it is most needed for long-term sustainable growth. This is particularly relevant because the majority of green projects only generate local currency revenues. The EBRD is aware that the region is at varying stages of green capital market development. For example, while some European countries, such as Estonia, Latvia and Poland, have seen some major green bond issuances, such markets are almost non-existent in other COOs. In order to support an environmentally and socially sustainable economic system in the EBRD region, as well as reorienting capital flows towards sustainable investment, the Bank will support capital markets to play their role in greening the financial system, working closely with relevant initiatives such as the UN Sustainable Stock Exchange initiative.

At local level, cities are significant Green House Gas (GHG) emitters and essential actors for accelerated climate and sustainability action. The EBRD will prioritise work at city level reflecting the potential contribution of activities in this sector to the green, inclusive and resilient transition qualities. Under EBRD Green Cities program and projects ⁹ the Bank also assists municipalities in the development of

Green City Action Plans (GCAPs), with several already adopted and being implemented. In the region the Bank is working with couple of cities in this framework, some exploratory work was done with the City of Maribor. Legislation, regulations and standards which set legal accountability and provide the ground for enforcement across players in the market are required to support the effective implementation of strategies and policies. The Legal Transition Team of the EBRD is well placed to support the Bank's further engagement on corporate climate governance both in relation to policy dialogue and client work.

CONCLUDING REMARKS

As explained above the EBRD is putting the green agenda at the forefront of its operations and policy work. In this context green policy priorities are already reflected both in many Country and Sector Strategies, including the one for Slovenia and other countries in the wider region of Central and South Eastern Europe. However, in practice that depends on individual project preparation and close working with the EBRD staff. The work on this start with the close involvement of country teams., where the work and contacts start at the EBRD Resident Offices (ROs), including the one in Ljubljana and with the support of the EBRD Regional Hub in Warsaw as well sector teams at the EBRD HQ.

Experiences gained by the EBRD are wide, but their impacts would be even larger if they would be reiterated by other FIs, including commercial banks, should we want to build a sustainable economies in coming decades, including in Slovenia and wider region.

⁹ See on current Green Cities 2 regional project, covering Slovenia at <https://www.ebrd.com/work-with-us/projects/psd/green-cities-2.html>

An application of climate metrics to the Slovenian banking system

*Iskra Sokolovska, Meta Ahtik and Primož Dolenc**

Tackling climate change requires a swift social change, crucially supported by private financial institutions. Climate risks are also increasingly acknowledged as material risks to financial stability. Measuring climate risks is fraught with challenges such as definitional issues or issues with data collection and gaps. The following text presents an application of climate metrics to the Slovenian banking system using metrics which bridge the existing data gaps. Results show that conclusions regarding decarbonisation are highly sensitive to the carbon metric used. Moreover, climate risks are systemic risks affected materially by both O-SIs and other institutions.

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1. Introduction

Climate change has brought forth new challenges for policy makers, corporates and the financial sector. A rapid foreseen increase in physical risks and structural reforms such as the transition to a green economy necessitate a quick response from policy makers in providing the appropriate guidance and setting up the necessary regulatory frameworks (Network for Greening the Financial System [NGFS], 2019a). Climate change risks are also widely acknowledged within the banking sector, as more and more regulatory institutions recognize the broader risks to financial stability. There are multiple challenges associated with capturing climate risks, ranging from definitional issues to data collection and gaps.

Tackling climate change requires decarbonisation which is an economy-wide process. The role of banks will be even more pronounced in financial systems which rely predominantly on bank financing. The following text presents an application of various climate metrics to the Slovenian banking system. The metrics build on the existing literature and represent a first step towards establishing a climate

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risk monitoring framework. This is necessary in order to gauge the magnitude of climate risks and their potential effects on financial stability or economic growth more broadly. We apply these metrics to the whole sample of Slovenian banks from June 2017-June 2020. The results show a high sensitivity to the climate metric used, decarbonisation in around half to two-thirds of all banks, depending on the climate metric used.

The paper is organized as follows: the second section reviews the overall institutional setting for climate policy in Slovenia (goals, regulation, banks' response to climate change), the third section outlines the methodology, the fourth section presents the results and related discussion, whereas the last section concludes.

II The institutional setting for climate policy in Slovenia

Climate policy goals are set at the national and the EU level, which accounts for differences in economic development (European Council, 2018). Emission goals entail a reduction in non-EU Emissions Trading Scheme emissions by 15% by 2030, or a maximum increase by 4% by 2020 relative to 2005 (European Council, 2009). While there is no goal for total emissions by 2020, the recently adopted National Energy and Climate Plan (hereinafter: NECP) envisions a reduction in total emissions by up to 36% by 2030 relative to 2005 (NECP, 2020). There are additional goals for energy efficiency and renewable energy use. Emissions goals are generally on track for both the 2020 and the 2030 policy horizons, although Covid-19 related turmoil and the subsequent recovery could lead to an increase in emissions (United Nations, 2020). Slovenia is not on track in terms of its renewable energy goals which is largely due to a large share of natural habitat areas (NECP, 2020), which is restrictive for windmill/solar park construction. Nevertheless, it reveals potential market niches for the banking sector. Banks should be incentivised to support the corporate sector in its efforts to decarbonise and implement eco-friendly solutions in general (for ex. circular economy solutions), as well as provide the necessary funding for energy-efficient homes. Namely, land use constraints and a substantial share of household emissions (around 1/5 in 2018) imply a role for green financial products which will support decarbonisation in the household sector as well.

The state of the economy is an additional determinant beyond the national climate policy goals. The Covid-19 economic turmoil may either delay progress towards decarbonisation or act as a catalyst, particularly in Europe. Namely, the European Commission (hereinafter: EC) has set forth an ambitious European Green Deal program prior

to the start of the Covid-19 crisis. Moreover, the recovery package foresees a substantial share for green investments of 1/4 of the total EUR 750 billion with a green oath of "doing no harm" for all public investment during the recovery (EC, 2020a). Nevertheless, leveraging private finance will be of crucial importance for the overall green economy transition. Moreover, despite the additional challenges brought forth with the crisis, timely action will prove crucial in tackling climate change. Namely, Covid-19 related delays in climate action could lead to delayed policy scenarios with elevated physical and transition risks (NGFS, 2020). Thus, boosting green investment as part of a crisis recovery strategy is likely to lead to a double dividend, i.e. a »win-win« solution (Stiglitz et al., 2020). Supporting green innovation through equity markets or the banking system is thus even more important, as it is a prerequisite for green investment.

Banks in Slovenia exhibit a high awareness of climate change and sustainability in general, as revealed by banks' responses to a climate survey¹. Most banks use some sustainability definition, typically from external entities. In terms of strategy, whereas most banks show high awareness of climate change risks conceptually, it is not embedded in their business practice operationally. Human capital investments remain marginal, as most banks have only a fraction of employees working on sustainability with some banks reporting establishing taskforces. Within risk management, climate risks are acknowledged as relevant over a medium-term horizon (between 5 and 10 years). This is true for both physical and transition risks and is in line with the literature in environmental economics (Pindyck, 2007), also referred to as the Tragedy of the Horizon (Carney, 2015). Regarding green financial products, some banks offer green consumption and, in some cases, green residential loans (4 out of 17 financial institutions as of August 2020²), though the reported amounts remain negligible. Most banks do not apply ESG (Environment, Society and Governance) ratings to their corporate loan portfolio, although a few are planning to implement them in the near to medium term. With the exception of one bank, banks in Slovenia do not issue green bonds³.

Although sustainability and climate change are not embedded in banks' business practices, this is subject to change due to forthcoming changes to regulation in the medium

¹ In Autumn 2019 Bank of Slovenia administered a survey on the future challenges for the banking sector, among them climate change. The survey covered various areas such as strategy, human capital investments, risk management, reporting and sustainability disclosures, green financial products and the use of ESG ratings.

² The number of banks offering green consumption or residential loans decreased by 2 compared to December 2019.

³ Indeed, bond financing is not a widely used approach, as the Slovenian banking system has traditionally relied on deposit financing.

term. Regulation to date (European Council, 2013; European Council; 2014) has introduced binding climate disclosures for large financial institutions⁴. Climate disclosures will likely be extended to smaller financial institutions, albeit with a simplified regime based on the principle of proportionality. The EC Taxonomy is a further avenue to incorporating climate risks in overall risk and portfolio management (EC, 2020b). The taxonomy outlines criteria for reporting at the activity level (as opposed to industry level), relating the activity to 6 environmental objectives. The taxonomy sets highly technical screening criteria, intended for disclosures by financial institutions and companies in the private sector. The issue of extending the scope to public institutions is under discussion. The EBA aims to develop a climate risk monitoring and stress testing framework. It has outlined its climate change action plans in the medium term - a 5-year horizon (European Banking Authority, 2019). The European Central Bank (hereinafter: ECB) has published guidelines on supervisory reporting on climate risks (ECB, 2019) and a consultation note on the EC Renewed Sustainable Finance Strategy (ECB, 2020). Climate change has also featured as one of the topics in the ECB's regular Financial Stability Reviews. Thus, climate change and sustainability considerations are likely to emerge as a new regulatory dimension in the near to medium term. Banks' preparedness for these processes will contribute to a smoother transition overall.

Admittedly, capturing climate related risks in regulatory frameworks is fraught with data challenges, from definitional issues to data gaps. Some of the literature on climate risks features a definition of climate-policy relevant sectors by Battiston et al. (2017), with some conceptions of climate metrics which bridge the existing climate data gaps and are thus applicable in the near term (Monasterolo et al., 2017). This paper presents an application and extension of these climate metrics for the Slovenian banking system.

III Methodology

This section outlines the methodology for the climate metrics used in this analysis⁵. Some of the existing literature on climate risks relies on the definition of climate-policy relevant sectors for the EU, based on Battiston et al. (2017). Climate-policy relevant sectors are defined based on three criteria: emissions, position in the energy value chain and overall relevance for climate policy. The scope of climate-policy relevant sectors is not necessarily identical as the structure of emissions varies per country.

Indeed, the Bank of Slovenia has assessed exposures to climate-sensitive sectors, using an in-house definition of climate sensitivity, based on the total contribution to emissions (Sokolovska, 2020). Whilst informative, exposures to climate-sensitive sectors do not capture the differences or changes in emissions across sectors and time. They are rather static measures which do not capture fully the relevance or the vulnerability of a particular institution to climate risks.

a) Climate metrics

Thus, Monasterolo et al. (2017) propose two new climate metrics, a »GHG exposure« and a »GHG holding« index. Both indices weigh the share of financial institutions' exposures across all sectors with the share of emissions by each economic sector⁶. The emissions exposure index (EE) uses the share of exposures in a financial institution's own balance sheet, thus reflecting vulnerability of a particular institution to climate risks. The emissions holdings index (EH) uses the share of exposures in the total systemic exposures to a particular sector, essentially reflecting market share and thus an institution's relevance in tackling climate risks.

$$EE_j = \sum_k w_k * S_k ; \quad EH_j = \sum_k w_{jk} * S_k$$

Where

$$S_k = \frac{Emissions_k}{Emissions}$$

is the share of emissions of industry k in total emissions;

$$w_{jk} = \frac{Exposures_{jk}}{Exposures_k}$$

is the share of exposures to industry k in bank j in total exposures to industry k and

$$w_k = \frac{Exposures_{jk}}{Exposures_j}$$

is the share of exposures to industry k in bank j in total exposures of bank j

The emissions exposures and holdings indices thus provide a way to account for the differences and changes in emissions across sectors. Although intuitive, assessing decarbonisation is not straightforward as the indices feature double weighing (of both exposures and emissions). Moreover, larger banks will tend to have larger values for the EH index due to the size of their balance sheets. Their results are thus not directly comparable to other banks'. The indices can be extended to account for the actual emissions of each particular sector, thus providing a metric of financial institutions' carbon footprint.

⁴ Large financial institutions are institutions with more than 500 employees.

⁵ The empirical section is based on Sokolovska (2020).

⁶ The authors include exposures to other entities as well, such as government and investment funds, whereas this analysis focuses on the banking system only.

$$CO2_j = Emissions_j = \sum_k w_{j,k} * Emissions_k$$

Carbon footprint is a more intuitive climate metric, though it has the same drawback as the EH index. Namely, large banks will tend to have higher values due to the sheer size of their exposures. Increasing exposures serves a social function as well, as it reflects higher credit activity. Thus, it is necessary to adjust for the size of the balance sheet, so as to gauge banks' decarbonisation effort in relation to credit activity. Thus, we define carbon intensity as carbon footprint per 1000 EUR of exposures to the NFC sector.

$$CO2_{-i_j} = \frac{CO2_j}{NFC_exposures_j}$$

The extensions of the initial indices thus lead to two climate metrics: carbon footprint and carbon intensity. These are in line with the climate metrics suggested by the NGFS (2019b). Admittedly, the climate metrics use sectoral emissions data, whereas ideally, we would use firm-level data. Nevertheless, sectoral emissions data allows for higher granularity compared to a climate sensitivity metric based on a static definition of climate-sensitive sectors.

b) Decarbonisation

The climate metrics outlined above can be used to assess the decarbonisation of banks' portfolios within a certain time-horizon. There are various ways to define decarbonisation, which is defined here as an improvement in one of the climate metrics over a three-year horizon. This methodology uses a three-year horizon as a medium-term horizon which would capture non-transitory changes in banks' credit portfolios. The climate metrics can be subject to various transformations, depending on the relevant dimension. For example, the CO₂ footprint defined above can change due to a change in emissions of the underlying industry or a change in the exposures to that industry. Thus, a higher CO₂ footprint may not reflect banks' decarbonisation accurately, since an increase in emissions by the underlying industry will lead to a higher CO₂ footprint, even if exposures to that industry were to be kept fixed. Thus, we calculate CO₂ footprint using both current emissions⁷ and fixed emissions. Using fixed emissions will reflect changes in the CO₂ footprint arising from changes in exposures only and will thus reflect banks' behaviour more accurately. The emissions series would alter the carbon intensity metric as well, which will be based on current or fixed emissions. The effect could be attributed to changes in emissions or weights, using a decomposition similar to re-

turn attribution in a portfolio analysis. Moreover, it could be argued that the CO₂ footprint metric is biased, as it attributes all systemic emissions to the banking system only. In reality, bank financing is a smaller share of total liabilities. For example, the share of bank financing is particularly small in the electricity sector⁸ (below 10%), compared to a large share of emissions (31% as of 2018). In the case of electricity, banks' carbon footprints would be overestimated, as they represent a smaller fraction of total financing for the electricity sector. Admittedly, this is a relevant consideration. Nevertheless, bank financing is still an important element in project financing relevant for the total outlook of the project. Thus, we show the main results using total emissions⁹.

IV Results and discussion

The results show a high sensitivity to the climate metric used. There is an increase in the CO₂ footprint for a substantial number of banks. Around half exhibit an increase in the CO₂ footprint, whereas decarbonisation can be observed for 7 banks when using current emissions. The CO₂ footprint improves for most banks when using fixed emissions, i.e. there is greater decarbonisation or smaller increase in CO₂ footprint if banks decreased or increased their CO₂ footprint respectively. Using carbon intensity as the climate metric leads to a substantial improvement in the number of banks which have decarbonized over 2017-2020. For example, decarbonisation can be observed for 11 banks out of 15, using fixed emissions and carbon intensity as the climate metric.

The sensitivity of the results to the climate metric is essentially a reflection of the various dimensions of the analysis. Moreover, the results should be interpreted carefully since an improvement in carbon intensity is not necessarily positive from a societal point of view. Namely, carbon intensity is defined as CO₂ footprint per EUR 1000 exposure. This implies that carbon intensity can improve due to a lower CO₂ footprint or higher exposures. Lower exposures may also lead to an improvement in carbon intensity as the decline in exposures will also lead to a decline in the CO₂ footprint, which may lead to an improvement in carbon intensity. Nevertheless, this does not reflect decarbonisation conceptually, as the improvement in the climate metric stems from a decline in credit growth and not simultaneous credit growth with a reduction in exposures to polluting industries which is the essence of green growth (Organisation for Economic Cooperation and Development, 2011). Analysing decarbonisation thus entails several dimensions.

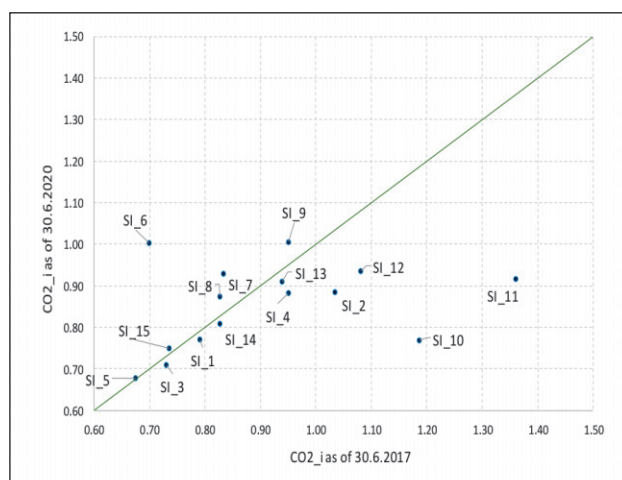
⁸ Bank of Slovenia estimates based on Ajpes data for 2018.

⁹ The main results are comparable when using emissions adjusted for the share of bank financing as well, albeit with smaller carbon footprints and thus carbon intensities as well.

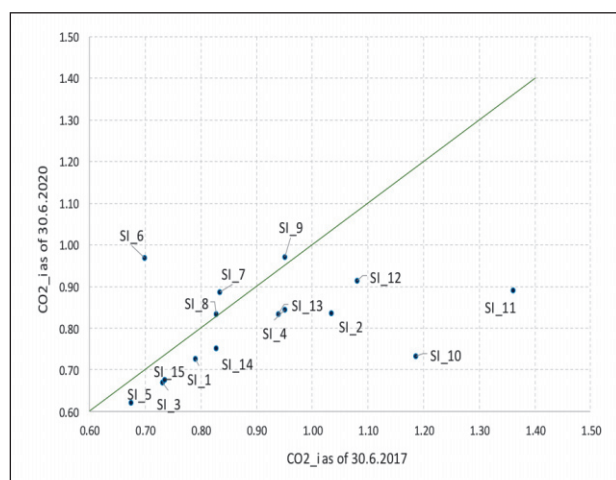
⁷ Current emissions entail emissions with a 1-year lag, due to lags in publication, to reflect the emissions series which would be available to banks at the time.

THE INTENTIONS OF THE REGULATORY INSTITUTIONS OF THE FINANCIAL SYSTEM CONCERNING REGULATION UPGRADING AND MANAGING RISKS ASSOCIATED WITH CLIMATE CHANGE

Graph 1: Carbon intensity across Slovenian banks as of 30.6.2017 and 30.6.2020 (current emissions)



Graph 2: Carbon intensity across Slovenian banks as of 30.6.2017 and 30.6.2020 (fixed emissions)



Source: Eurostat, Bank of Slovenia (2020)

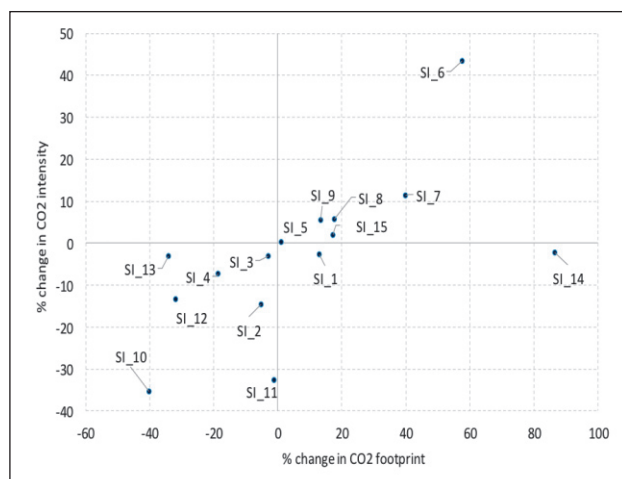
The following graphs show the changes in carbon footprint and carbon intensity for all 15 banks in Slovenia between 2017 and 2020. Banks can be allocated to one of four quadrants, depending on the changes in their carbon footprint and intensity. The first quadrant includes banks which have a deterioration in both climate metrics, the second and fourth quadrant include banks which have an improvement in one climate metric, whereas the third quadrant includes banks which have an improvement in both climate metrics over the observed period.

The results show that most banks fall under the first and third quadrants, when using CO₂ footprint calculated using current emissions as the climate metric. Banks in these quadrants exhibit simultaneous improvement or deterioration in both their carbon footprint and carbon intensity over the period considered. This implies that changes in their bal-

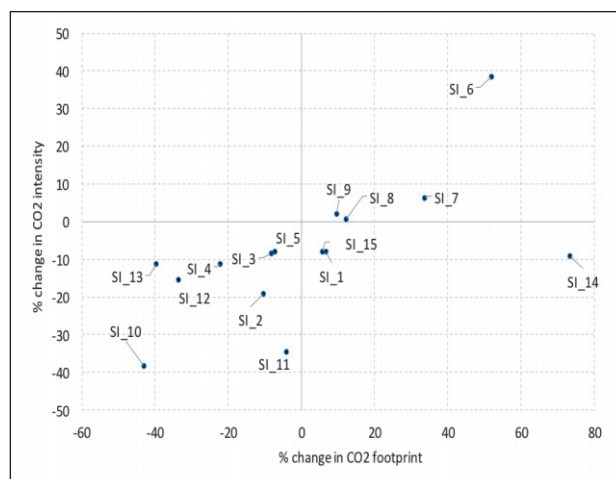
ance sheets do not offset the changes in their carbon footprint. Namely, a larger balance sheet could offset the increase in the carbon footprint and thus lead to a lower carbon intensity. Some banks move from the first quadrant to the fourth quadrant when using fixed emissions. The increase in the balance sheet (NFC portfolio) offsets the increase in the CO₂ footprint, thus resulting in a lower carbon intensity. Thus, using fixed emissions results in an improvement in at least one climate metric for around 2/3 of all banks (11/15).

The results can be further related to banks' systemic relevance, depending on whether they are classified as O-SIs or other institutions. O-SIs typically have higher CO₂ footprint, but mainly exhibit better results regarding carbon intensity, which is predicated by the size of their credit portfolios. Both O-SIs and other institutions show an improve-

Graph 3: Changes in carbon footprint and intensity between June 2017 and June 2020 (current emissions)



Graph 4: Changes in carbon footprint and intensity between June 2017 and June 2020 (fixed emissions)



Source: Eurostat, Bank of Slovenia (2020)

ment in their carbon intensity over the period considered, with greater changes in other institutions' metrics. The results improve further when observing the subset of significant banks only. The carbon footprint decreases leading to a lower carbon intensity compared to other institutions over the period considered. This implies that decarbonisation efforts will have to encompass both types of institutions as both can affect the overall systemic footprint materially. In addition, larger banks may exhibit economies of scale and may thus act as industry leaders.

V Conclusion

Climate change and the impending green economy transition pose a wide array of challenges for both the financial and the non-financial sector. Corporates will have to adjust their business models, investors are embracing ESG strategies and central banks and regulators worldwide have widely acknowledged the emergence of climate risks as a relevant risk category. Capturing climate risks poses methodological challenges, ranging from definitional issues to data gaps. Regulatory efforts in capturing climate risks are in their nascent stage, with some climate metrics proposed in the literature. This text has presented an application of climate metrics to the whole sample of Slovenian banks. We thus define a measure of carbon footprint and carbon intensity, measured as carbon footprint per units of exposure, based on existing climate metrics. As a sensitivity check, we employ various transformations of the emissions series, using both current and fixed emissions, as well as adjusting the emissions series for the share of bank financing per industry. The results show that decarbonisation can be observed in around half of all banks' portfolios between June 2017 and June 2020, when using carbon footprint calculated using current emissions as the climate metric. The number of banks which have decarbonized increases to 11 when using carbon intensity as the climate metric, calculated using fixed emissions. This implies a high sensitivity of the results to the climate metric used, which reflects the multidimensionality of the analysis. Moreover, the results should be interpreted carefully as improvements in carbon intensity may reflect a smaller balance sheet which would also lead to a lower carbon footprint and thus improvement in carbon intensity. This is not indicative of decarbonisation conceptually, as decarbonisation should entail both credit growth and an improvement in one of the climate metrics. Otherwise, the improvement in carbon intensity would reflect the well-known trade-off between emissions reduction and growth at the bank level. The latter is a crucial point for the future prospects of the green economy transition.

The results presented above shed light on banks' decarbonisation, although there are some caveats. The climate metrics presented above represent a way to bridge the existing data gaps, whilst accounting for the dynamics in the change of the portfolio. Moreover, the analysis can be extended in various ways. First of all, the analysis can be extended to include firm-level data where possible.

Second, the carbon metrics can be extended to account for sectoral carbon intensity as well. Third, the analysis can be extended towards other stakeholders, such as insurers or types of risks, for example market risks. Finally, scenario analysis is an additional avenue which is pending on further methodological improvements.

A smooth transition will depend on the amount of financing available to steer the economy on a more sustainable growth path. This will require a leading role of banks and investors in funding green projects, which will depend in turn on the regulatory frameworks and pipeline of environmental projects. Fostering a supportive environment to entice private capital to fund green investment will be a challenge for all stakeholders. The results of the survey administered by the Bank of Slovenia show that banks exhibit a high awareness of climate risks, although this remains at the conceptual rather than operational level. The national climate and energy plan in turn envisions ambitious climate goals which will require large amounts of private funding. Admittedly, the current economic crisis may hinder progress towards a green economy, though green recovery packages provide new opportunities and market niches for investors and banks. Thus, a timely assessment of the magnitude of climate risks and the role of banks in the green economy transition will serve to ameliorate the economic fallout from the Covid-19 crisis and ensure a smooth transition in the post-crisis period.

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“Energy efficiency investments in the EU – What do firms say?”

*Fotios Kalantzis, Debora Revoltella and Simon Savšek**

This paper discusses energy efficiency investments in the EU and Slovenia as captured by the EIB Investment Survey (EIBIS). The policymakers of the EU have made an ambitious commitment to make the Union the first climate-neutral continent by 2050. The EIBIS provides a unique opportunity to understand better firms' investments decisions in energy efficiency measures and the role of various factors behind their actions across various countries, sectors and size-classes. We show that more than 40% of EU firms and almost half of firms that invest in Slovenia, took measures to improve energy efficiency in 2019 and that this share appears positively associated with the energy intensity. Larger firms also invest more, while policy measures, such as energy audits, are also paramount in overcoming information barriers and promoting energy efficiency-related investments. While energy costs are reported to be among the important obstacles to investment and there is substantial potential for energy saving to be tapped, it is to be seen how the COVID-19 pandemic will change the energy efficiency and overall investment in Europe.

JEL Q40 Q43 Q50

Introduction

The planet is poised to get warmer on average by around 3.5 to 4°C by the end of the century, if current levels of greenhouse gas emissions persist, posing a serious challenge to the ecosystem. Such a scenario would wipe out close to 70% of all plant species, around half of all mammals and more than a third of birds, not mentioning impact on health and pollution (EIB, 2020c). Under the Paris Agreement, a majority of governments agreed to maintain the global warming well below 2°C and to pursue efforts to keep it to 1.5°C. To reach this target, we need to emit less than 580 gigatonnes of CO₂ by mid-century. At the current rate of about 37 gigatonnes annually, this implies that the stock will be exhausted by 2032.

The EU leaders have made an even more ambitious commitment. The plan is to make the European Union the first climate-neutral continent by 2050. The EIB, as requested by the European Council and the EU Member States, has a key role to play in putting sustainability at the heart of the EU project, by supporting the design and implementation of the European Green Deal and by accelerating

* All European Investment Bank. This article follows closely the report “Going green: Who is investing in energy efficiency, and why it matters”. The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the EIB. Any remaining errors are the sole responsibility of the authors.

the transition to a net-zero emissions and climate-resilient EU economy. In this context, the EIB has agreed to increase the share of the support dedicated to climate action and environmental sustainability investments, including in energy efficiency, to 50% by 2025, with an overall package of instruments leading to some € 1 trillion of investments for climate and the environment by 2030. All lending activities also will be aligned with the goals of the Paris Agreement by the end of 2020 (EIB, 2019). Energy efficiency (EE) is one of the key pillars of the EU long-term strategic vision for a prosperous, modern, competitive and climate-neutral economy. With structurally higher energy prices in Europe (EC, 2019a), EU firms have been traditionally facing growing incentives to invest in EE measures to control energy costs and remain competitive in the globalised business environment. At the same time, higher energy cost concerns seem to act as an economic incentive for investments into EE, which is not the case for other obstacles to investment. Hence, in order to allow for a comprehensive assessment of the role that energy plays in firms it is essential to include all factors in equation, similar to as it is done for other inputs, such as capital and labour. Identifying key areas for policy intervention, intelligence on market gaps, and understanding firms' obstacles in placing sustainable investments, will be crucial in this respect. The EIB Investment Survey (EIBIS) provides important insight into firms' investments decisions about EE measures and the role of various factors behind their investment activity, helping to identify potential green investment gaps across countries and sectors. EU firms, on average, spent about 10% of their total investment for energy efficiency improvements. Further, we show that more than 40% of EU firms and almost half of firms that invest in Slovenia, took measures to improve energy efficiency in 2019. This share appears positively associated with the energy intensity. Larger firms also invested more, while energy audits seem to be paramount in supporting energy efficiency. Nevertheless, only 38% of building stock is reported to be of high-energy efficiency standards, while significant differences across countries exist. Overall, Slovenia scores relatively favourably across these indicators. Looking at major obstacles to investment, 28% of EU firms consider energy costs as a major obstacle to investment in 2019. As the prices of fossil fuels declined substantially during the COVID-19 pandemic and because the virus has left an enormous negative macroeconomic impact on the world economy, including investment, it remains to be seen how binding the post-COVID-19 commitment to immediately decarbonise our world will prove to be. As embodied in several strategic documents (see for example UN (2015), UN

(2020) or EC (2019b)) and also because the clock to save the planet is ticking, it goes without saying that the recovery in the EU should be green, sustainable and inclusive.

The paper is structured as follows: First, we present figures relating to EE investments of EU firms. Then, we show the importance of energy audits in stimulating these investments by overcoming the information barriers and discuss the role of various factors in EE investments based on an econometric analysis. In the final section, we look into the COVID-19 impact for green investments and draw some policy conclusions.

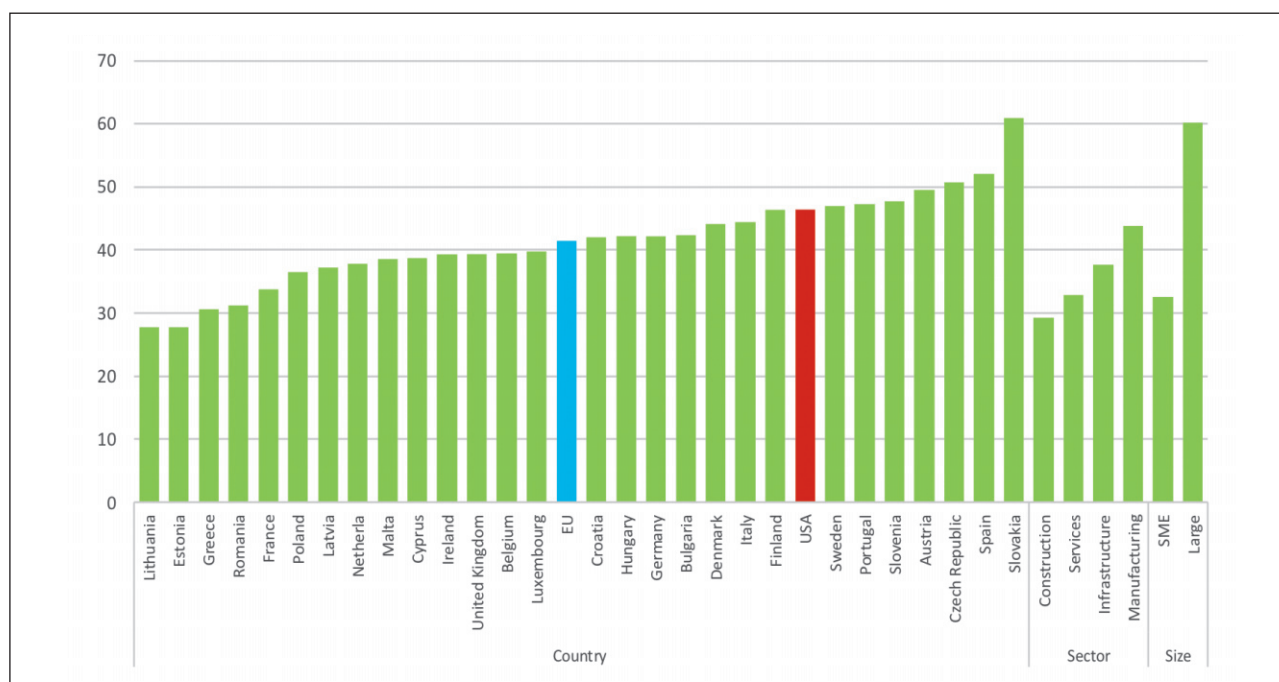
Are EU firms exploiting the EE (untapped) potential?

To assess the role of EE investments and their impact, we use the EIB Investment Survey (EIBIS). The annual survey carried out since 2016 containing information on investment activities of some 12,000 firms from all Member States, size classes and main sectors, offers qualitative and quantitative information about their investment activities, their financing needs and the difficulties they face. Last year's edition also enables comparison of these activities with firms from the US. A particular attention is devoted to answers regarding EE expenditures, the quality of their building stock, and the role of various factors in their EE investment decisions, which we compare across the countries, regions and sectors.

The EIBIS results show that 41% of EU firms undertook measures to improve EE in 2019 (Figure 1). Among the Member States, Slovakia came first with the highest percentage of firms investing in EE with 61%. Spain, the Czech Republic, Austria, Slovenia, Portugal and Sweden followed. These seven EU countries also invest more in EE compared to the United States (47%). On the other side of the spectrum, firms from Lithuania, Estonia, Greece, Romania and France, have, on average, rather limited investment in EE. According to the data, the share of firms investing in EE appears to be positively associated with the energy intensity¹ and size of firms. Specifically, manufacturing, the most energy intensive sector, presented the highest share of firms investing in it (43% in 2019), followed by infrastructure (37%) and services (30%). On the other hand, the construction sector displayed the lowest share with only a quarter of firms investing in these activities. Moreover, large firms report twice as likely to invest in EE as small and medium-sized enterprises (SMEs). As SMEs represent a backbone of the European economy, incentivising firms to make use of these investments would be an important

¹ Energy intensive sectors are the following (using 2-digit NACE codes): 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 22, 23, 24, 35, 36, 37, 38, 39, 49, 50, 51

Figure 1 Share of firms investing in energy efficiency measures (%)



Source: Authors' calculations based on EIBIS. Notes: All firms (data not shown for those who said don't know/refused). Investment decision is a binary variable that takes the value of one when firms surveyed have invested and 0 otherwise. Sectors are divided in energy intensive and non-energy intensive using clustering analysis. Question: What proportion of the total investment was primarily for measures to improve energy efficiency in your organization?

step towards the climate goals as EE investment is also not a very high investment priority overall.

As a matter of fact, EU firms spent only about a tenth of their total investment on EE improvements in 2019 (Figure 2) on average, less than their US peers (12%). On the other hand, the share of EU firms that invested in such measures, as well as their spending on them, increased between 2018 and 2019. Again, spending on EE, as proportion of total investments, is higher in energy-intensive sectors and among large firms, where energy is a more significant cost determinant.

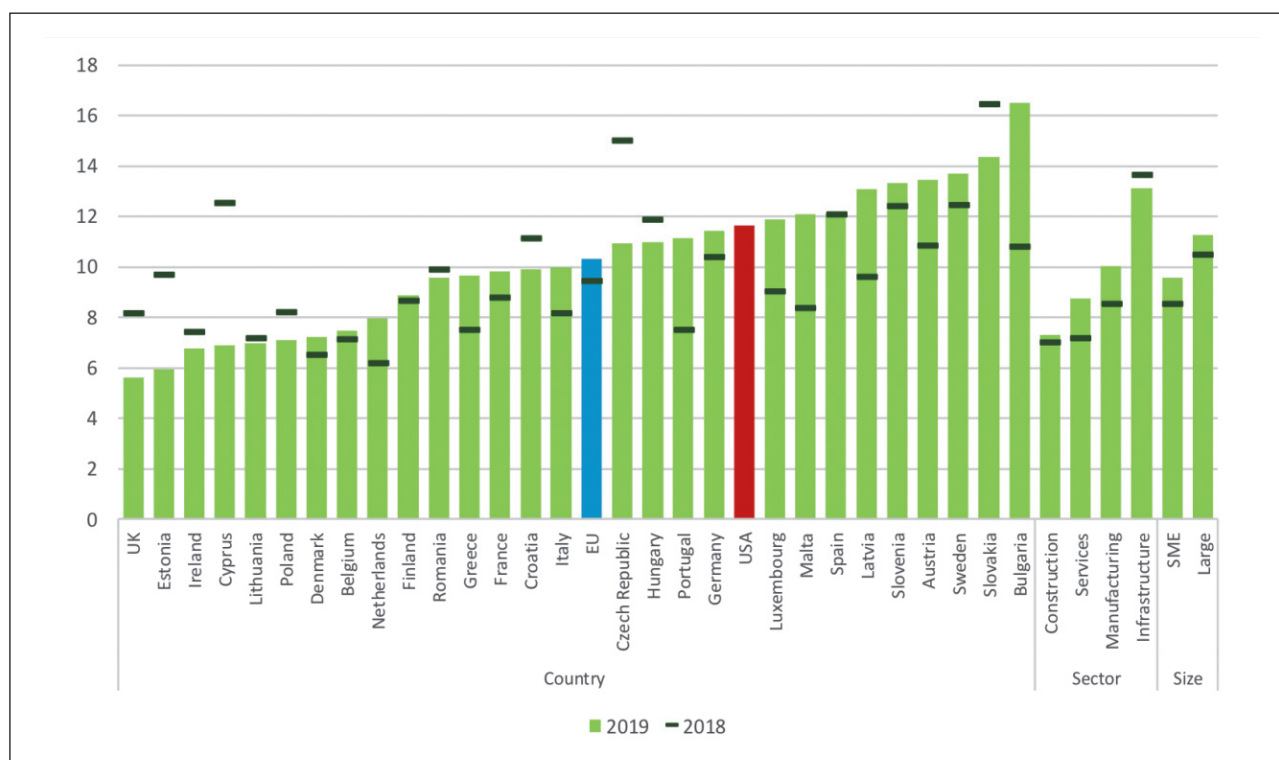
Firms in the infrastructure and manufacturing sectors, which are more energy-intensive, spent 13% and 10%, respectively, of their total investment budget on measures to improve their energy savings in 2019, while firms in the services sector and the construction sector spent less, 9% and 7.5%, respectively. This share also varies substantially across the EU Member States. Firms in Bulgaria spent more on EE projects (16%) than firms in any other EU country. Slovakia, Sweden, Austria and Slovenia follow. Nevertheless, spending in each country varied significantly between the EIBIS surveys, possibly reflecting a non-recurring nature of energy efficiency investment (Figure 2).

Despite their importance, only a third of the European firms' commercial building stock satisfies high or highest energy efficiency standards, with the corresponding share in the

US being somehow lower. Over the years, the perceptions of firms on the quality of their building stock deteriorated, implying that most of Europe's existing building stock has not yet being considerably affected by the recently adopted energy performance requirements in the Energy Performance of Buildings Directive 2010/31/EU and the Energy Efficiency Directive 2012/27/EU.

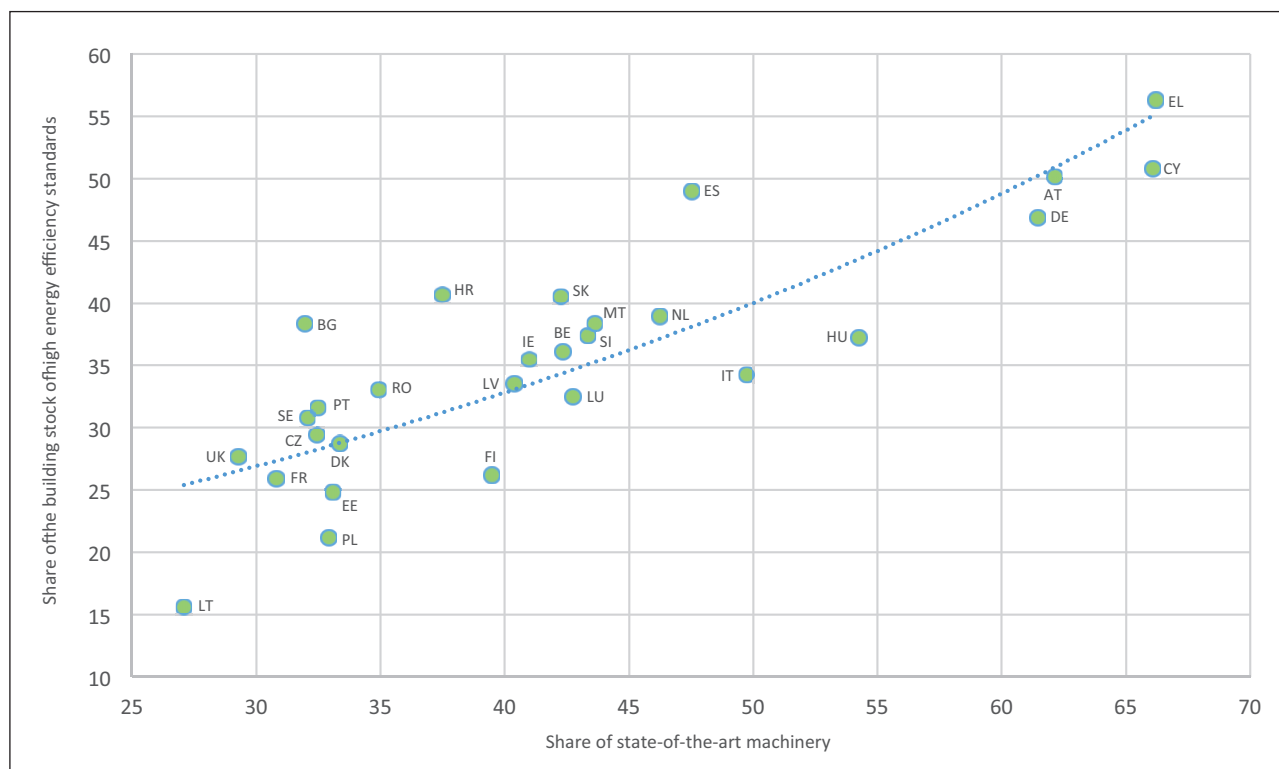
The opinion of firms on the quality of their building stock varies considerably across countries and regions. Firms located in the South of Europe, such as in Greece and Cyprus, believe that more than 50% of their building stock satisfies high or highest energy efficiency standards, almost four times more than firms in Lithuania, which believe that only 16% of their building stock is energy-efficient. Apparently, part of the cross-country differences could be explained by differences in culture, expectations, technical information and environmental objectives. These factors affect firms' beliefs on building stock performance when assessing various aspects, such as thermal comfort, air quality, activity noise, light quality and environmental control. The correlation between the quality of buildings and the state-of-the-art machinery the buildings are equipped with (Figure 3), shows that these perceptions go hand-in-hand, which implies a collective action towards environment-friendly and modern infrastructure.

Figure 2 Share of firms' total investment in measures to improve energy efficiency (%)



Source: Authors' calculations based on EIBIS. Notes: All firms (data not shown for those who said don't know/refused). Question: What proportion of the total investment was primarily for measures to improve energy efficiency in your organization?

Figure 3 Building stock of high or highest energy efficiency standards and state-of-the-art machinery (%), 2019



Source: Authors' calculations based on EIBIS. Notes: All firms (data not shown for those who said don't know/refused). Questions: What proportion, if any, of your commercial building stock satisfies high or highest energy efficiency standards? What proportion, if any, of your machinery and equipment, including ICT, would you say is state-of-the-art? By state-of-the-art I mean cutting edge or developed from the most recent ideas or methods.

EE investments – Can we stimulate them with energy audits?

Recent research (Kalantzis and Revoltella, 2019) confirms that firms with an energy audit invest more in EE. Raising firms' awareness seem to be therefore crucial to implement such measures. Furthermore, it follows from research that information from the energy audit is more crucial for small firms and for investments in support processes such as lighting, wall insulation etc. than in production processes such as replacement of machinery and equipment. It is also telling us that the beneficial impact of energy audits ceases to exist when firms are finance constrained and that information campaigns are one of the most efficient available instruments among other instruments, such as regulatory, financial and voluntary agreements, to promote energy audits in SMEs (see Kalantzis and Revoltella, 2019 and EIB, 2020a).

Turning back to the EIBIS, the share of firms investing in energy-saving measures was indeed considerably higher for firms with an energy audit. On average, three in five firms that carried out an energy audit also invested in EE in 2019 (Figure 4). In Slovenia, for example, two thirds of the firms surveyed with an energy audit also invested in EE improvements in 2019. However, less firms have an energy audit in place compared to the EU (just more than

a third, compared to two fifths in the EU). The crucial role of energy audits in overcoming the above-mentioned information barriers is also apparent when assessing firms' investment decisions without an energy audit. These firms appear to invest more substantially in areas other than energy efficiency, possibly because they fail to understand the potential direct and indirect benefits of energy-saving technologies. In addition, advanced management practices also appear to be positively associated with EE investment. Firms that have more advanced managerial practices (strategic business monitoring system in place and/or a performance based pay practice) have a higher probability to invest in EE compared to firms with more basic managerial practices.

Firms' EE investments – Why they matter?

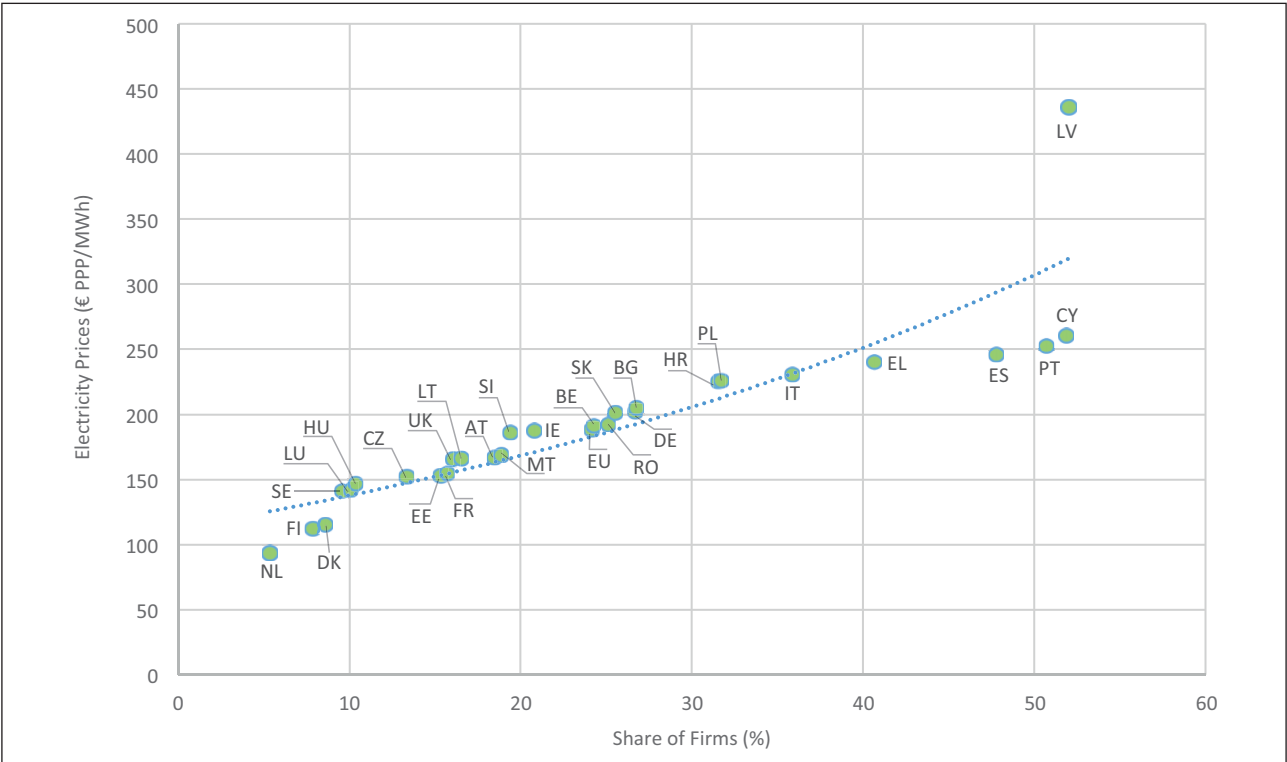
Energy costs affect firms' investment decisions and their financial performance in a number of ways, given that energy serves as one of the key inputs to the production processes. In 2019, 28% of European firms reported energy costs as a major obstacle to investment (Figure 5). While this figure is lower compared to other cited obstacles in EIBIS, such as availability of skilled staff, access to finance and critical infrastructure, it does reflect a significant change in firms' perspectives, given that it grew steadily from roughly a fifth in 2016.

Figure 4 Share of firms investing in energy efficiency, with and without an energy audit (%)



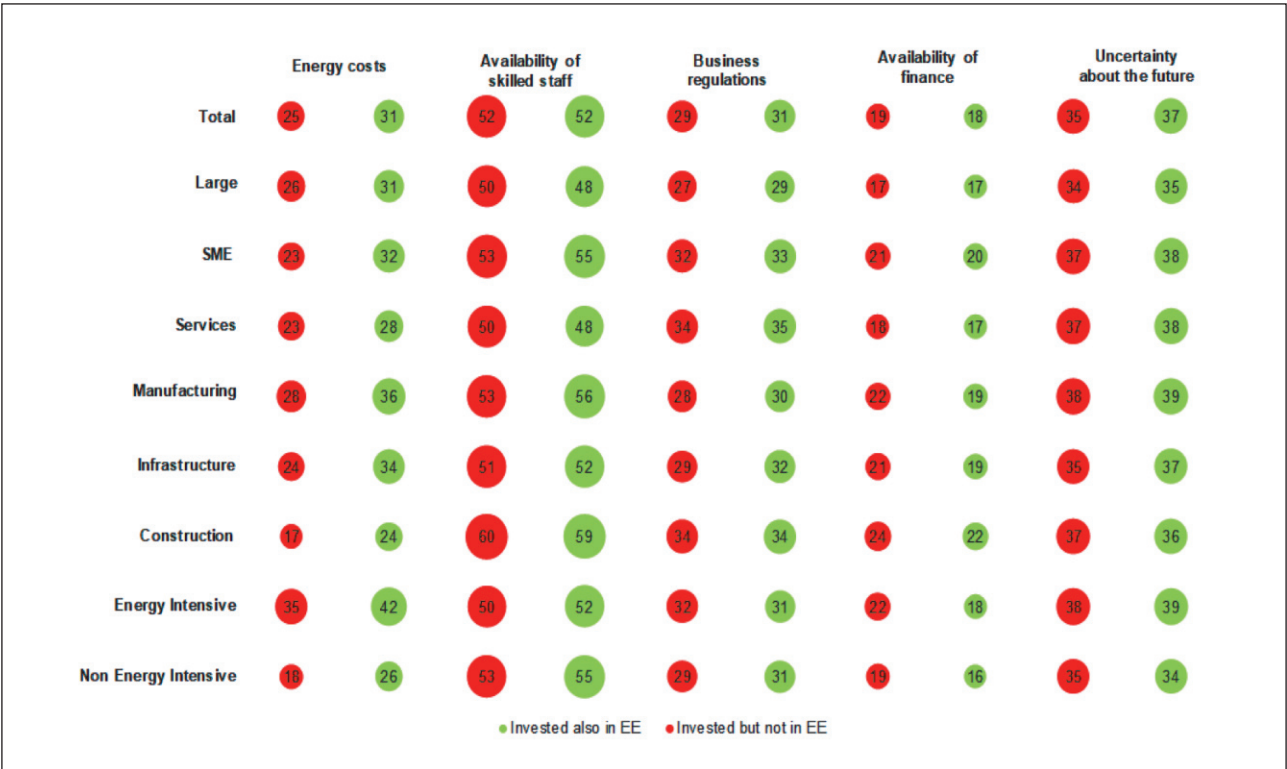
Source: Authors' calculations based on EIBIS. Notes: All firms (data not shown for those who said don't know/refused). Question: Can I check, in the past three years has your company had an energy audit? By this, I mean an assessment of the energy needs and efficiency of your company's building or buildings.

Figure 5 Energy costs as an obstacle to investment and electricity prices



Source: Authors’ calculations based on EIBIS and Eurostat. Notes: All firms (data not shown for those who said a minor obstacle/not an obstacle at all/don’t know/refused). Average share of firms that cited energy cost as a major barrier to investment and electricity prices over 2016-19. Question: Thinking about your investment activities, to what extent are energy costs an obstacle? Is a major obstacle, a minor obstacle or not an obstacle at all?

Figure 6 Long-term barriers to investment (%)



Source: Authors’ calculations based on EIBIS. Notes: All firms (data not shown for those who said a minor obstacle/not an obstacle at all/don’t know/refused). Question: Thinking about your investment activities, to what extent are energy costs an obstacle? Are they a major obstacle, a minor obstacle or not an obstacle at all?

The role of energy cost in firms' investment decisions also differs considerably across EU members and sectors and is indeed correlated with energy costs. The share of firms that reported energy cost as a major obstacle to investment ranged from 6% in Denmark to 56% in Latvia according to the survey. Geographically, this share is higher in southern countries (Italy, Greece, Spain, Portugal, Cyprus) compared to Scandinavian countries (Denmark, Finland, Sweden) and is, for example, strongly positively correlated with the presence of higher electricity prices (Figure 5). Firms located in the Southern Europe have, despite the falling oil prices, experienced higher energy costs due to higher taxes and levies aimed at supporting the deployment of renewables.

At the same time, higher energy costs seem to act as an economic incentive for investments into EE. Our research shows that regardless of firm size and sector, investments in energy-saving technologies are higher where energy is considered an important cost factor. Awareness of these firms makes them inclined to invest in cost-saving technologies. On the contrary, there seems to be no significant difference between investment decisions in EE and other investment areas of other long-term barriers (Figure 6), such as access to finance, availability of skilled staff, business regulation and uncertainty about the future.

In an attempt to identify the motivational factors of investment decisions in EE measures, we conducted an econometric analysis based on the EIBIS (Table 1). According to our findings (dominance analysis²), the size and sector appear to be the most important determinants of EE investments, explaining together more than 40% of the variation of the dependent³ variable. The estimated coefficients indicate that the likelihood of firms investing in EE is higher for larger firms and for the manufacturing and infrastructure sectors. This is in line with the existing literature (Czarnitzki et al., 2007), which supports the idea that certain sectors, most notably the energy-intensive ones, are seeking ways to reduce their energy costs.

Energy audits and innovation activities score second and third in our dominance analysis. Each of them explains about a fifth of the variation of the dependent variable. The findings indicate that firms that carried out an energy audit or innovation activities are 13% and 15%, respectively, more likely to invest in EE, confirming the previous studies (Kalantzis and Revoltella (2019), which suggested that energy audits help firms to overcome the information

barriers to efficiency measures. Moreover, innovative firms embark on EE measures to improve their financial and operational performance, as well as to reduce their carbon footprint (Horbach et al., 2012).

Finally, concerns about higher energy costs, financial constraints and firms' age appear to be additional factors in explaining EE investments. As expected, such investments are more attractive to firms for which energy cost is a major concern because it affects strongly their competitiveness. Similarly, funding is important to firms for adopting such measures as EE investments are not considered to be a part of the core business activity. The age of the firm, together with the deteriorating building stock, are also important in this respect. Nevertheless, the good news is that in the 2019 wave of the EIBIS compared to the previous one, more firms were willing to spend money on such measures, as the time effect in the regression shows.

Energy efficiency investments in times of the COVID-19 pandemic and related policy considerations

The impact of the pandemic on investment in climate change mitigation is expected to vary across segments of the clean energy market. Depending on the policy response, investment in EE and other domestic/commercial sector activities are likely to be hard hit. By contrast, renewable energy investment, and in particular utility-scale projects, will be likely less affected.

The COVID-19 crisis has already had important implications for the energy markets. In order to contain the spread of the virus, governments put in place strict quarantine measures, which drastically reduced the consumption of the three main energy commodities: electricity, gas and oil. In the short term, this helped reducing GHG emissions, but also led to a significant drop in energy and carbon prices as their demand declined too. As a matter of fact, the nationwide lockdowns caused peak-hour traffic and electricity levels to collapse across Europe, while some energy-intensive sectors operated far below the pre-COVID-19 peaks.⁴ It was estimated that the measures undertaken by the European countries to slow the spread of the virus led to a 60% drop in daily carbon emissions (Sia Partners, 2020) and around 17% globally compared to the average 2019 daily levels (Le Quéré et al., 2020).

However, reductions caused by economic downturns, are usually temporary and typically lead to emissions increase as economies resume growth. For example, after the global financial crisis of 2008-2009, global carbon emissions grew by 5.9% in 2010, more than offsetting the 1.4%

² Dominance analysis involves testing all possible combinations of predictors in separate regression models (i.e., subset models) to reveal the additional contribution of each predictor relative to other predictors under study.

³ The dependent variable is a dummy variable that takes the value of one if a firm invested in energy efficiency measures and zero otherwise.

⁴ See for example COVID-19 economic updates (EIB, 2020b).

Table 1: Empirical estimation of the determinants of firms' energy efficiency investments in EU

VARIABLES	Coeff.	Marginal Effects	Std Domin stat.	Ranking
Construction	-0.178***	-0.0371***		
Services	-0.171***	-0.0357***		
Infrastructure	0.0330	0.00699		
Small	0.157***	0.0318***		
Medium	0.506***	0.107***		
Large	1.021***	0.223***		
Constant (benchmark manufacturing, micro)	-208.1***		41%	1
Energy audit	0.608***	0.127***	22%	2
Innovative firm	0.721***	0.150***	21%	3
Quality of buildings	0.418***	0.0870***	5%	4
Energy cost – major obstacle	0.413***	0.0859***	5%	5
Age	0.0965***	0.0201***	3%	6
Exporter	-0.174***	-0.0361***	1%	7
Finance constraint	-0.150**	-0.0311**	1%	8
2019	0.102***	0.0213***	0%	9
Country fixed effects	YES	YES	YES	YES
Observations	17,233	17,233	17,233	17,233

Source: Authors' estimations Notes: *, **, *** indicate significance at 10%, 5% and 1%, respectively; the dependent variable is a binary and is valued at one if there was an investment and zero otherwise, based on EIBIS 2018 and 2019.

decrease in 2009. To this end, it is certain that the falling carbon and fossil fuel prices will ultimately also lead to increased consumption of fossil fuels and thereby increase GHG emissions already in the medium term. The environment of low fossil fuel and carbon prices also undermines the incentives of firms to invest in energy-saving technologies. This is further magnified when considering the uncertainty that the clean-energy projects under development are facing over construction schedules, equipment, labour and delivery windows. Some Member States have already faced such issues (see EIB, 2020b). IEA (2020) expects investments in efficiency and end-use applications to fall 10-15% in 2020 as vehicle sales and construction activity slacken and purchases of more efficient appliances and equipment decrease. Recent policy agreements at the national and the EU levels (see for example EIB, 2020b), which greatly emphasised the EU green recovery, are certainly an important step in the right direction. Energy efficiency investments can contribute to this goals by creating new jobs, boosting economic activity in labour-intensive sectors and by delivering longer-term benefits such as increased competitiveness, reduced greenhouse gas emissions, improved energy affordability and lower energy bills. In this context, a better understanding of firms' investment decisions in energy efficiency measures and their key determinants is critical to design appropriate policy actions and maintain the momentum for climate action. The current crisis should

be therefore seen as an opportunity to build a secure and sustainable energy future in the EU, underpinning a fair climate transition for all of its citizens. The recent European Commission's proposal for a recovery plan – Next Generation EU – is likely to prove an important initiative in this decarbonisation process.

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How can Slovenian banks implement TCFD recommendations?

*Silva Deželan and Marko Košak**

Recent years have brought an increasing number of frameworks proposed by regulators, central banks, and trade associations to support the flow of private capital towards sustainable development. Many of these are related to climate change and the necessity for a transition towards a lower-carbon future. The European Commission's Sustainable Finance Action Plan, which will require financial market participants (incl.) to disclose the degree of environmental sustainability of their products, and the recommendations of the Task Force for Climate Related Financial Disclosures, better known as TCFD recommendations, are just two examples. In this article we discuss the recommended TCFD framework, which is increasingly considered a standard for climate-related reporting and provide guidance for its implementation by banks (in Slovenia).

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1. Introduction

The Paris Climate Agreement of December 2015 has significantly impacted the attitudes towards climate change globally. Recent years brought an increasing number of disclosure frameworks by governments, regulators, and multilateral organizations to support the flow of private capital towards sustainable development. A good example is the European Commission's Action Plan on Financing Sustainable Growth and the recent European Green Deal which aim to make Europe climate neutral by 2050 while creating a common language for sustainable finance. As part of the Action Plan financial market, participants will be required to provide more disclosures on the impacts of climate-related risks and opportunities on the value of their assets and liabilities and be more transparent about the degree of environmental sustainability of their products.

Given that climate change is a global problem and requires global solutions, the whole financial sector has a critical role to play. Central banks and other regulatory bodies are urged to implement measures to shift investment towards

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The views expressed in this article are those of the authors and do not necessarily represent those of the institutions with which the authors are affiliated.

low-carbon sectors and enforce the existing or planned climate-related regulations.¹ The governors of central banks started warning that companies, which do not consider the climate-related financial risks and fail to adjust to a low-carbon future, will fail to exist. Central banks began integrating the monitoring of climate-related financial risks into their daily supervisory activities, financial stability monitoring and board risk management. To increase the awareness of how climate-related risk can increase credit, market, business and reputational risks of banks, central banks started performing the so-called climate-change stress tests.² The results of these tests should lead to better understanding of how climate-related risks should be measured and managed through improved systems, processes, and training. Together with supervisory guidelines, stress tests should also encourage banks to adopt longer-term strategies which will improve the sustainability of their business models.

The financial impacts of climate-related risks are often overlooked due to different perceptions of what is considered material to companies and because of the difficulties in measuring climate risk. And while climate reporting requirements, frameworks and guidelines have been around for over a decade, the reporting landscape remained fragmented. This resulted in inconsistent information that is not fit for use by banks, investors, or others. Namely, without the right information, assets and liabilities may be incorrectly priced or valued, leading to a misallocation of capital.

¹ Recent reports suggest that while major banks increasingly pledge to become the so-called net-zero banks by 2050, many of them are not taking meaningful measures to phase out of all fossil fuel financing. In response to such reports central banks are urged to take further action. See also: <https://www.responsible-investor.com/articles/banking-industry-slammed-for-climate-hypocrisy-as-latest-fossil-lending-figures-released>.

² See <https://www.fitchratings.com/research/banks/bank-climate-change-stress-tests-10-09-2020>.

Consequently, the (EU) regulatory agencies started pushing for climate reporting, with the proposed frameworks mostly being based on the TCFD recommendations. The recommendations by the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) created during climate negotiations in Paris in 2015, provide a solution in this respect. The TCFD recommendations emerged to help investors, banks and other stakeholders understand their financial exposure to climate risk and help companies disclose this information in a clear and consistent way. In this article we describe the TCFD recommendations and discuss their relevance for financial institutions, in particular banks. We propose a pathway for the implementation of climate-related reporting by banks in Slovenia and conclude with some final remarks.

TCFD recommendations and why they are important

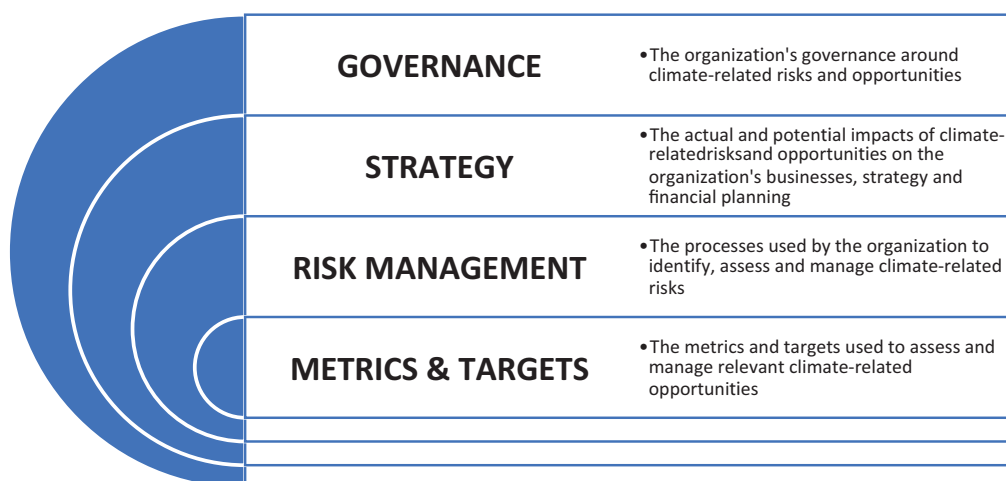
The TCFD has developed a set of recommendations for organizations to voluntarily disclose climate-related financial risks in their regular reports to their investors, banks, insurers, and other stakeholders in a consistent way.³ The recommendations refer to disclosures on *governance, strategy, risk management and metrics and targets* associated with climate-related risks and opportunities (see Figure 1).

According to the TCFD recommendations, organizations are encouraged to

- achieve board-level governance of climate risk and opportunity assessments,
- develop *strategies* aligned with global climate targets,
- disclose *risk management* processes and
- report annually on greenhouse gas (GHG) emissions and/or other relevant *metrics*.

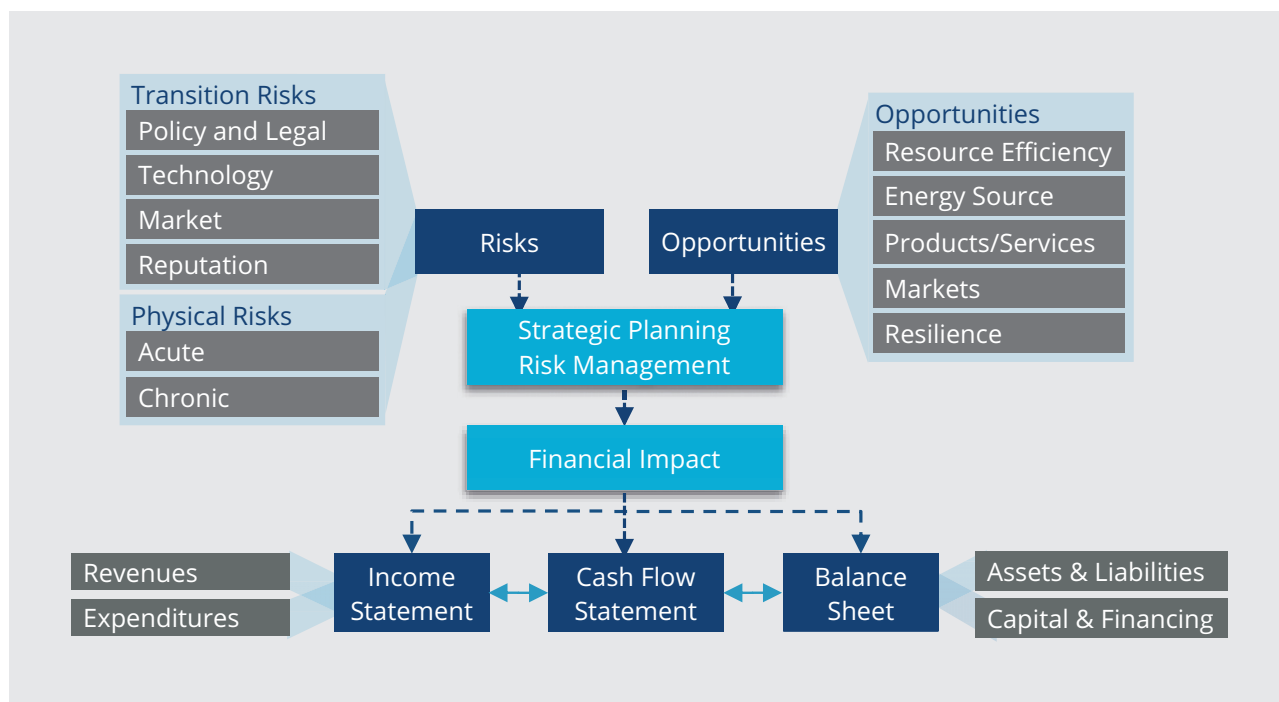
³ For more information on TCFD see <https://www.fsb-tcfd.org>.

Figure 1: Core elements of recommended climate-related financial disclosures



Source: TCFD (2017a).

Figure 2: Overview of climate-related risks, opportunities and financial impact



Source: TCFD 2017a.

The strategy part includes a recommendation for organisations to conduct scenario analysis and assess how their financial position would change under different global temperature increases, including the Paris Agreement's 2°C trajectory. The increased support for the TCFD recommendations suggests that organisations are acknowledging climate risk as financial risk.⁴

The financial impacts of climate issues on organizations depend on the climate-related risks and opportunities an organization is exposed to and its decisions on how to capture those opportunities and managing those risks. The latter can be managed through mitigation, transfer, acceptance, or control. After the issues have been assessed and the responses determined, an organization can consider what their impacts on revenues, expenditures, assets and liabilities, and capital and financing could be. Figure 2 illustrates the main climate-related risks and opportunities that organizations, according to the TCFD, need to take into account as part of their strategy or risk management to assess the possible financial implications.

Climate-related issues can affect several aspects of an organization's current, but also future financial positions. In case of banks, the TCFD has found evidence that climate-related risks and opportunities primarily affect their finan-

cial position through their revenues and by affecting the value of their assets and liabilities (TCFD 2017b). Banks should, for example consider the potential opportunities for enhancing or creating new revenues through the provision of services and products that contribute to climate mitigation and adaptation. At the same time, the changes in policies, technology, and market dynamics related to climate change could substantially affect the valuation of their clients' assets and liabilities and thus their ability to repay loans.

1. Relevance of TCFD for financial regulators and supervisory agencies

Climate disclosures by banks are presently probably more advanced than those by other financial institutions, due to legislation and other regulatory initiatives, such as the Article 173 of the French Energy Transition law⁵ and the UK Prudential Regulation Authority's supervisory oversight of climate-related financial risks. While some of the most advanced banks are already describing the methodologies they apply for climate scenario analysis and report on their exposure to high carbon sectors, there is generally limited comparability between banks, also because there are no standardised methodologies and metrics in place (Climate Financial Risk Forum 2020).

⁴ More than 1000 organizations are currently supporting TCFD recommendations, including corporates with a combined market cap of USD 12trn and investors with USD 138.8trn of assets under management. See TCFD Press Release of FEBRUARY 12, 2020. https://www.fsb-tcf.org/wp-content/uploads/2020/02/PR-TCFD-1000-Supporters_FINAL.pdf

⁵ This law came into effect on 1 January 2016 and brings requirements for firms (incl. financial institutions) to measure their GHG footprint, assess exposure to transition and physical climate risks and portfolio alignment with a 2°C pathway etc.

One of the recommendations by the TCFD was for the companies (incl. banks) to produce various scenarios of *plausible futures* to analyse and disclose how different climate outcomes might affect their financial position. The *Network for Greening the Financial System*, a coalition of central banks focused on the environment, has recently published its own set of scenarios that its members can use to avoid climate-related failures. Most central banks are yet far from using these scenarios or act on them as the coronavirus pandemic has temporarily postponed plans of this sort.⁶

Stress tests are one of the biggest tools in the arsenal of central banks for assessing how banks can withstand economic shocks. Climate stress tests, which can provide key data on exposure to so-called stranded assets and help with risk assessment amid concern about the economic impact of climate change. In a 2018 climate stress test, the Dutch central bank predicted that a climate shock could knock 3% off the value of banks' assets and damage capital ratios. The Dutch model will be rolled out more broadly by other regulators, and the tests will show where climate risks and fossil fuel exposure are sitting in the system and which banks are better prepared to deal with them.

France's financial regulator, the *Autorité de Contrôle Prudentiel et de Résolution*, or ACPR, will publish the results of its first climate stress test in April 2021 and the European Banking Authority also plans to develop a climate stress test. The Bank of England is already working on a climate stress testing process although it has postponed its stress tests due to the pandemic.⁷ The BoE's tests will be mandatory, while in France, the ACPR's stress tests will be voluntary, although the major banks will take part.

Even though the stress tests might be temporarily postponed, banks need to be able to explain what steps they have taken to ensure that their capital levels adequately cover the risks to which they are exposed, including climate-related risks. They cannot rely solely on insurance companies to pay for climate-related losses. While disclosures on climate-related information are currently still largely voluntary, they are soon expected to become mandatory, hence banks should not wait to be forced to disclose. The UK Government has already announced that it will mandate TCFD-aligned disclosures for certain large organizations within three years under its Green Finance Strategy and the Bank of England has already issued guidance on how to mitigate climate risks.⁸ In April 2020 the Swedish Government has told its financial regulator, *Finansinspektionen*, which was already exploring climate scenario analy-

sis and stress testing, to monitor the Paris-alignment of loan books and investment portfolios. *Finansinspektionen* will also help develop tools and techniques for measures and reporting on climate for the finance industry to help the Swedish government meet its commitment to enhance transparency and align private capital with the Paris Agreement.⁹

Possibly the truest implementation of the TCFD recommendations so far has just been announced by New Zealand's Government which became the first in the world to make the TCFD framework mandatory across the financial system. While many other countries, including Australia, Canada, the UK, France, Japan, and the European Union are developing templates for climate risk reporting New Zealand is taking lead. According to the proposals, all listed issuers, banks, asset managers and insurers with assets over NZ\$1bn will be required to disclose their exposure to climate-related risks and their policies to address such risks. The new regime will be applied on a *comply or explain* basis. New Zealand's audit regulator, the External Reporting Board, will develop a climate reporting standard and the Financial Markets Authority will oversee enforcement. The legislation could come into force as early as 2023 which brings New Zealand in a position to establish international best practice.¹⁰

4. Expectations by ECB regarding climate disclosures and the role of EBA¹¹

Like many other central banks the ECB, as a member of the *Network for Greening the Financial System*, has paid increasingly more attention to climate change related risks in recent years and climate related risks have been identified as key risk driver on the SSM Risk Map for the euro area banking sector. Accordingly, ECB is assuming that climate change related risk will have both a direct and indirect effects for banks, which are expected to be reflected in the consequences for the continuity of banks' operations and the risk profiles of their assets (ECB, 2019). As climate change related risks are anticipated to intensify over a medium-term, banks should act in a timely manner and adequately integrate these risks into their risk management framework (ECB, 2019). The ECB is closely following the developments that are predicted to impact euro area banks and is accordingly developing supporting initiatives. So, just recently ECB published a "Guide on climate-related and environmental risks" that outlines the ECB's view regarding

⁶ See *Network for Greening the Financial System* (2020).

⁷ See S&P Global Intelligence (2020).

⁸ As reported by Reuters (2020)

⁹ See <https://www.responsible-investor.com/articles/swedish-regulator-to-monitor-paris-alignment-of-country-s-investment-portfolios-and-loan-books>

¹⁰ Reported by Responsible Investor (2020).

¹¹ This section is based on ECB (2020) and EBA (2019).

“...the safe and prudent management of climate-related and environmental risks...” as they could be handled under the current prudential framework. With the guidelines the ECB is expressing its expectations how banks in the euro zone should consider climate related and environmental risks when it comes to their business strategy, governance and risk management frameworks and how to provide greater transparency by enhancing their climate-related and environmental disclosures (ECB 2020a).

As specifically noted in the Guide itself, the recommendations published in the documents are not binding for banks, but they rather serve as a basis for supervisory dialog (ECB 2020a), which means supervised institutions will be given certain flexibility in their coping with climate-related risks.

As regards the application of the guidelines the ECB distinguishes between significant and less significant institutions. While on the one hand significant institutions are expected to fully apply the principles from the guide and the guidelines will be used in the ECB’s supervisory dialog, the less significant institutions on the other hand will follow the directions of their local NCAs that may issue their own guidance on climate-related and environmental risks. Nevertheless, the ECB is expecting from NCAs to apply the main standards of the guidelines also in the supervision of less significant institutions, taking into account the proportionality principle as regards their risk profile and business model.

The ECB’s supervisory expectations specifically refer to three major areas, first, to banks’ business models and strategy, second, to governance and risk appetite and third, to risk management framework in supervised institutions.

When shaping their business models and implementing business strategies banks are expected to understand and take into account the influence of climate related and environmental risks on the environment in which they operate. The impact analysis should comprehend material risk factors not only in the short but also in the long term, so banks’ management could be able to make informed business and strategic decisions. The aforementioned stress tests and scenario analyses can be used as an effective tool for this kind of the analyses. Additionally, climate-related and environmental key performance indicators (e.g. carbon emission footprint of institution’s assets, average energy label of the mortgage portfolio, etc.) can be integrated in the bank’s strategic framework with the aim to make strategic goals quantifiable.

Based on the CRD requirements banks are expected to put in place robust governance arrangements that allow for effective identification, management and monitoring of relevant risks and this is how ECB’s guidelines expect institutions to integrate climate-related and environmental risks in

the governance process. More specifically the management body of a supervised bank is expected to allocate roles and responsibilities to its members and to dedicated committees responsible for climate-related and environmental issues. The management body is also expected to effectively execute the oversight role regarding the bank’s exposures and responses to climate-related and environmental risks. An essential part of this process is also the inclusion of the climate-related and environmental risks in the institution’s risk appetite framework, which means that exact descriptions of climate-related and environmental risks in the risk appetite statement (RAS) are needed, followed by appropriate key risk indicators and adequate limits for climate-related and environmental risks. Guidelines also suggest the institutions to explicitly assign responsibilities for climate-related and environmental risks within the institution’s organizational structure and responsibilities are expected to be adequately documented in the relevant governance documents.

Further, the ECB guidelines expect banks to incorporate climate-related and environmental risks as risk drivers into their existing risk management frameworks, meaning that these particular risk categories have to be monitored over sufficiently long time horizon and these risks have to be properly identified and quantified within the bank’s process of ensuring appropriate capital adequacy. Thus climate-related and environmental risks need to be integrated into credit, operational, market and liquidity risk management and appropriately elaborated within the ICAAP process. As regards credit risk supervised institution are expected to integrate climate-related and environmental risk at all stages of the credit granting process and credit processing. Credit risks with regard to climate-related and environmental factors are expected to be adequately monitored, risk classification procedures are expected to be adjusted and loan pricing is expected to reflect various costs driven by climate-related and environmental risks. Similarly, operational risk management should integrate the adverse impact of climate related events on business continuity and reputational and liability risks.

Market risk positions of banks, with regard to climate-related and environmental risk factors are expected to be monitored as well and closely scrutinised by developing stress testing scenarios where the following crucial risk aspect should be considered:

- The impact of the physical and transition risk,
- The evolvement of climate-related and environmental risk factors under various scenarios, which are not entirely based on historical data, knowing that this kind of risk might not be reflected in historical records at all, and

- Short, medium- and long-term materialisation of climate-related and environmental risks, depending on the scenarios considered.

It is essential for the supervisors to modify the usual stress testing playbook as the nature of climate-related risk scenarios is typically substantially different from the usual macroeconomic shocks defined by the supervisory authorities and implemented in each stress testing exercise. The usual approach with a scenarios design of a single adverse macroeconomic shock where the effects are extrapolated over a three year period is just not suitable approach for a credible and meaningful climate related risk scenario design where shocks may be much more versatile and consequences expanded well over a couple of years' time period (Lehmann, 2020). The ECB's guidelines represent a step in the right direction as they will effectively enable supervisors to integrate climate-related and environmental risks into the existing supervisory framework, which is exactly what The central bank Network for Greening the Financial system (NGFS) already called for last year when they request regulators and supervisors to integrate climate-related risks into standard financial stability monitoring and supervision.

The second significant EU institution that substantially contributes to the regulatory framework for the banking sector in the EU is European Banking Authority (EBA). The EBA's position on all the environmental aspects of the banking sector regulation is presented and elaborated in the Action Plan on Sustainable Finance, published in December 2019. In the action plan we can identify three mandates for the EBA in the area of sustainable finance and they all rest on the provisions already integrated in the recently revised CRR2 / CRD5 package. Although the EBA action plan addresses the ESG risk in general, it can be seen in the context of explained tentative activities that the environmental component and climate related risks are going to be positioned in the forefront of the ESG risks related engagements. The three main EBA's mandates as explained in the EBA Action Plan are as follows (EBA, Action Plan, 2019):

- to assess the potential inclusion of ESG risks in the supervisory review and evaluation process performed by competent authorities;
- to require large institutions with publicly listed issuances to disclose information on ESG risks, physical risks and transition risks;
- to assess whether a dedicated prudential treatment of exposures associated substantially with environmental and/or social objectives and activities would be justified as a component of Pillar 1 capital requirements. In particular, the assessment of methodologies, appropriate criteria and potential effects is expected.

Based on its mandate the EBA is determined to pursue a particular sequence of engagements, starting with the strategy and risk management, as it is essential to understand institutions' current business mix from a sustainability perspective in order to measure and manage it in relation to their chosen strategy. The latter can then be used for scenario analysis (EBA, Action Plan, 2019) and subsequently the supervised institutions and regulator(s) can conduct their empirical evaluation of appropriate prudential measures. The timeline for EBA regulatory activities on sustainable finance has been laid out in its own work plan with key priorities identified over a period until the mid-year 2025.

5. A pathway for implementing TCFD recommendations by Slovenian banks

In response to the regulatory shift towards mandatory climate-related financial disclosures in the EU, Slovenian banks will need to provide climate risk-related disclosures in line with the TCFD recommendations. Banks are expected to publish meaningful information and key metrics on climate-related and environmental risks that they deem to be material for their banking books, trading books and debt and equity underwriting activities (see ECB 2020a).¹² In this section we describe a best practise approach to climate-related risk and strategy disclosures that banks are recommended to follow.

In line with the principles for effective climate-related financial disclosures set out in the TCFD recommendations, disclosures should have the following characteristics:

- represent relevant information;
- be specific and complete;
- be clear, balanced, and understandable;
- be consistent over time;
- be comparable among companies within a sector, industry, or portfolio;
- be reliable, verifiable, and objective;
- be provided on a timely basis.

Banks need to consider that their key audiences (i.e. investors, clients, credit rating agencies, regulators and civil society) will have different informational requirements and have to provide climate disclosures accordingly. While civil society will likely focus on what bank are actively doing to facilitate the transition and build climate resilience through their loan provision and how they fair against the industry best practice, the regulators will primarily look at the quality and clarity of disclosures that ensure correct pricing of risks

¹² According to ECB (2020) these disclosures also need to be aligned with the European Commission's Guidelines on non-financial reporting: Supplement on reporting climate-related information.

and efficient financial markets (Climate Financial Risk Forum 2020).

In addition, banks need to define key consideration in their assessment of the materiality of climate-related and environmental risks in their disclosure policies, the frequency of disclosures and their form. If climate-related risks are not deemed material, the bank needs to document its judgement with the available qualitative and quantitative information that underpinned its assessment.

Banks in the EU are furthermore expected to disclose **financially material climate-related risks** in accordance with the European Commission's *Guidelines on non-financial reporting: Supplement on reporting climate-related information*, which integrates the TCFD recommendations and provides guidance consistent with the EU Non-Financial Reporting Directive.¹³ The expected disclosures are related to business model and strategy, governance and risk management. When banks disclose figures, metrics and targets as material, they are expected to disclose or reference the methodologies, definitions and criteria related to these disclosures.

Banks are expected to provide climate-related disclosures at the firm - and product level and cover both, risks and opportunities across the four core elements as recommended by the TCFD. At the firm level, they are supposed to disclose their climate strategy and processes for identifying, assessing and managing climate-related financial risks and opportunities and how these processes are integrated in their overall risk management practice and processes.

Banks should also disclose - at the firm and at product level - how they contribute to the transition to a net zero economy and build resilience to physical climate risks through development of products such as green bonds, green mortgages, green loans, etc.

Figure 3 summarises the most important annual climate disclosures for banks and the steps banks should take in the process of defining their climate strategy and its implementation. As such, Figure 3 also illustrates the pathway for banks to the implementation of TCFD recommendations. According to the last step in Figure 3, banks are expected to disclose Scope 1, Scope 2 and Scope 3 greenhouse gas emissions (GHG) for their assets, whereby they can adopt a step-by-step, granular approach to measuring carbon emissions of their assets. In addition to disclosing climate-related metrics on the products they provide, banks are also expected to report on the greenhouse gas emissions (scope 1 and 2) that are a direct result of their own operations.

Banks can disclose the climate-related information in different forms: as a separate, TCFD report, as part of their annual sustainability reports or integrated in their annual (financial) reports.

6. Useful tools for TCFD implementation

Many tools are available to (Slovenian) banks to facilitate their implementation of the TCFD recommendations. Next to the guides by the TCFD that are available through its *Knowledge Hub*¹⁴ other collaborative initiatives by and for financial institutions can provide further guidance. Examples include the *UN Environment Finance Initiative's (UNEP FI) pilot* with sixteen of the world's leading banks to conduct scenario-based assessments of transition-related risks and opportunities as proposed by the TCFD recommendations, a climate scenario analysis tool for bank lending books by the *2° Investing Initiative* and the proposal for standardised carbon accounting by the *Partnership for Carbon Accounting Financials (PCAF)*. Their relevance is briefly described below.

UNEP FI cooperated with 16 of the world's leading banks and management consultancies Oliver Wyman and Mercer to develop transition- and physical assessment models and metrics to enable scenario-based, forward-looking assessment and disclosure of climate-related risks and opportunities. The developed methodologies (and case studies) enable banks to be more transparent about their exposure to climate-related risks and opportunities, in line with the TCFD recommendations. Using the methodologies, banks can start assessing physical climate risks in their loan portfolios and evaluate their impacts on key credit risk metrics (*Probability of Default* and *Loan-to-Value* ratios). The forward-looking assessments offer longer-term insights that go beyond the usual stress-testing horizon of 2-3 years.¹⁵

After extensive testing with 17 global financial institutions the *2° Investing Initiative (2DII)* has just launched a climate scenario analysis tool for bank lending books.¹⁶ In this way 2DII is expanding its Paris Agreement Capital Transition Assessment (PACTA) methodology beyond equities and bonds, to offer financial institutions a more granular view of the alignment of their corporate loan books by sector and

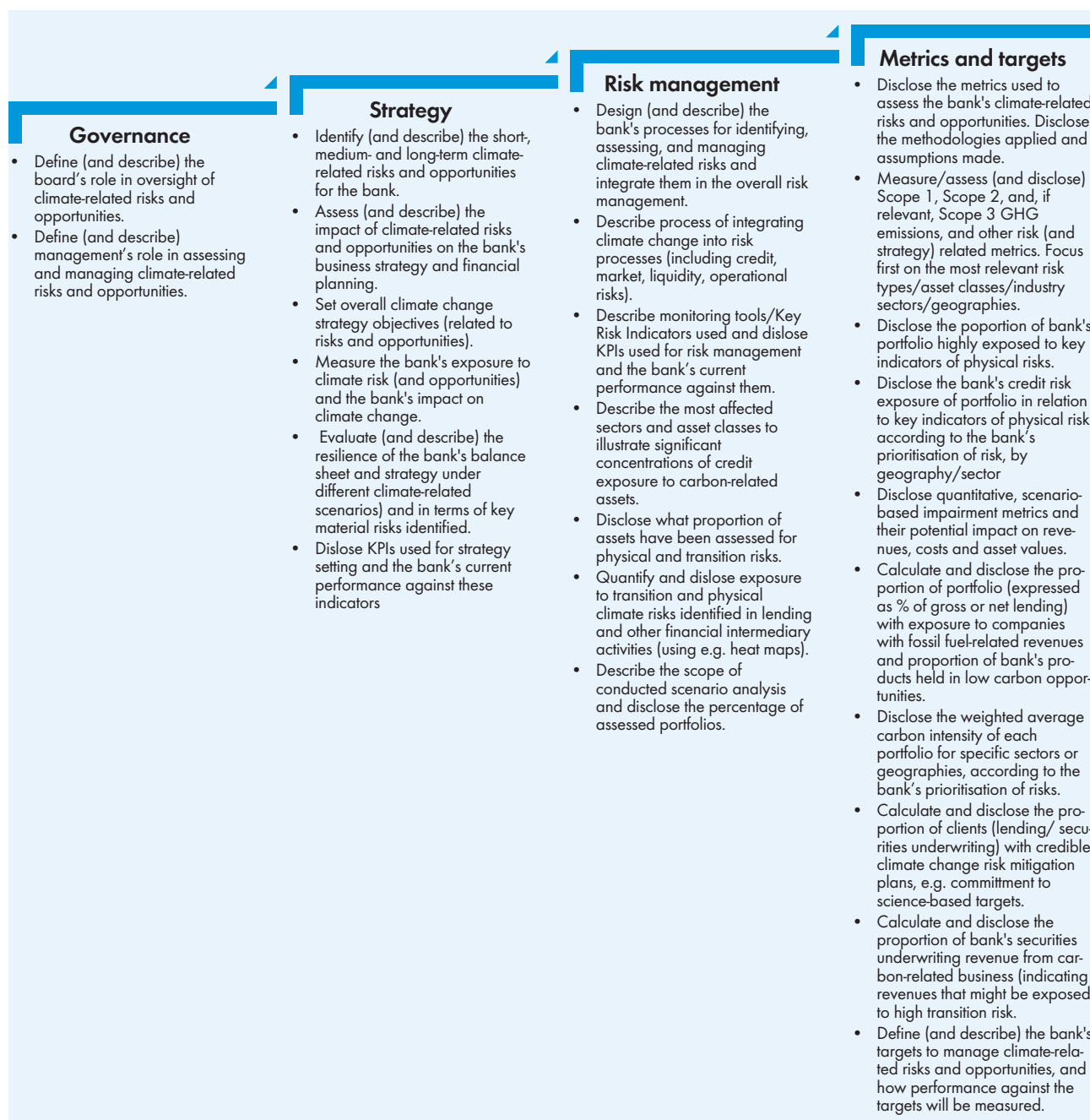
¹⁴ https://www.tcfdbh.org/resource/?search_keyword=&order=desc&orderby=resource_date

¹⁵ The following two reports by the UNEP FI summarise the results of the pilot: *Extending our Horizons: Assessing Credit Risk and Opportunity in a Changing Climate* (April 2018) which details the jointly developed methodology for scenario-based assessment of the transition-related risk and opportunities, and *Navigating a New Climate: Assessing Credit Risk and Opportunity in a Changing Climate* (July 2018) which covers assessment methodologies for physical risk).

¹⁶ For more information on PACTA for banks see their website here: <https://www.transitionmonitor.com/pacta-for-banks-2020/>

¹³ Directive 2014/95/EU – also called the non-financial reporting directive (NFRD) – lays down the rules on disclosure of non-financial and diversity information by large companies. Companies are required to include non-financial statements in their annual reports from 2018 onwards.

Figure 3: Implementation path of TCFD recommendations for a bank



Source: Deželan & Košak, based on TCFD (2017), ECB (2020a) and Baker (2019).

related technologies, at both the corporate client and portfolio level. The freely available PACTA for Banks methodology enables banks to make their lending towards aligned with Paris-based climate scenarios, set climate targets and engage with clients on their contribution. The Partnership for Carbon Accounting Financials (PCAF)¹⁷ is an industry-led partnership that aims to standardise carbon accounting for the financial sector and promotes measurement and disclosure of greenhouse gas emissions of

loans and investments in a standardised way. Namely, without transparent and rigorous carbon accounting the sector will not be able to decrease the level of carbon emissions it finances. The open-access, free-of-charge PCAF initiative allows banks and investors globally to assess the greenhouse gas emissions of their portfolios as they align their business strategies with the Paris Climate Agreement.

Concluding remarks

In this article we focus on the disclosures of climate-related risks and opportunities by banks (and other financial institu-

¹⁷ More information on PCAF can be found on their website: <https://carbon-accountingfinancials.com/>

tions). Note however, that banks are expected to consider other environmental risks disclosures as well and include risks stemming from other environmental factors, such as water stress, biodiversity loss, pollution, etc. in their regular disclosures. Given how rapidly disclosure frameworks and the needs of market participants are evolving, banks are strongly advised to start incorporating climate-related disclosures into their regular disclosures. This article provides a framework for the provision of such disclosures based on the TCFD recommendations.

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GRI Standards for sustainability reporting and their application in the banking sector

*Eva Volmajer, Matjaž Denac and Gregor Radonjič**

Banks participate in environmental burden in many ways, direct and indirect. Although many banks have already implemented environmental management principles, nowadays the sustainable operations are required as well, and communication about this issue is becoming essential. Large European companies are obliged to disclose the data on coping with environmental and social issues, and non-financial reporting must be compliant with the Directive 2014/95/EU, also known as NFRD. One of the recognised international standards for sustainability reporting is also the Global Reporting Initiative (GRI) Standards, which contribute to the consistency, reliability, and relevance of sustainability reports. Many European banks were the first ones reporting in accordance with the GRI Guidelines and Standards; therefore, this paper aims to discuss the applicability of the GRI Standards in the banking sector. To present the topic more transparently, we have conducted a SWOT analysis to discuss strengths, weaknesses, opportunities, and threats of reporting according to GRI Standards. Some examples of sustainability reporting of banks, operating in Slovenia and abroad are discussed as well.

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1. Introduction

Each economic activity generates a certain impact on the environment, and banks are no exception. Their impact is significant, and banks are even recognized as ‘silent destroyers’. Banks can contribute to environmental impacts directly and indirectly. Direct pollution is a result of energy consumption for providing IT services, central heating and air-conditioning, operating office machinery and furniture, paper and water use, waste generated, etc. (Hutchinson, et al., 1994, pp. 15-16), while indirect impacts are generated by financing wasteful and polluting industry, e.g. in the fossil fuel projects (Vetter, 2020). The managers in banks are aware of these impacts and are already implementing certain environmental policy measures, such as the application of ISO 14000 series standards, EMAS, environmental reporting, or some other environmental policy tools. As a result, many papers exist on partial solving or diminishing environmental problems (Weber, 2005; Aizawa and Yang, 2010; Ramnarain and Pillay, 2016; Fijałkowska, Zyznarska-Dworczak and Garsztka, 2018; Park and Kim, 2020).

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But the introduction of environmental management in a company's operations is no longer sufficient; moreover, sustainable operations are required also in the banking sector. Sustainable development, which is frequently understood as sustained change, growth, or successful development (Lélé, 2017), requires different approaches in business operating. The measures on sustainability are not enough and communication about this issue is becoming essential. Furthermore, large European companies are obliged to disclose the data on coping with environmental and social issues. Non-financial reporting in the EU Member States must be compliant with the Non-Financial Reporting Directive 2014/95/EU (NFRD) and may rely on international frameworks (EP and the Council, 2014).

At present, the NFRD requires information about the environment, social and employee issues, human rights, and bribery and corruption. Banks, asset managers, pension funds, and others in the financial sector are concerned that, as things currently stand, they do not have all the information they need from the companies they invest in (Townsend and Kelly, 2020). The common EU non-financial reporting standard does not yet exist, therefore the sustainable reporting is rather disordered so far (Carnevale, Mazzuca and Venturini, 2012; Jones, Comfort and Hillier, 2016; Arraiano and Accounting, 2018; Venturelli, Cosma and Leopizzi, 2018; Avrampon et al., 2019), but there are many efforts to regulate that segment of reporting. Currently many standards and frameworks for sustainable reporting exist, such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), International Integrated Reporting Framework (IIRF), Task Force on Climate-related Financial Disclosures (TCFD), Carbon Disclosure Project (CDP), UN Guiding Principles Reporting Framework on human rights, and many more (Townsend and Kelly, 2020).

One recognised international framework to be applied with the purpose of sustainability reporting is also the Global Reporting Initiative (hereinafter: the GRI Standards) (EP and the Council, 2014). Apart from third-party verification, applying frameworks such as the GRI, contribute to the consistency, reliability, and relevance of sustainability reports (Weber, 2012). Many European banks like Deutsche Bank, BNP Paribas, UBS, Danske Bank, Swedbank, Commerzbank AG, Société Générale Group, Erste Group, Credit Suisse were the first ones reporting about sustainability measures using GRI standards (Deutsche Bank, 2020; BNP Paribas, 2019; UBS, 2020a; Danske Bank Group, 2015; Swedbank, 2020; Ernst & Young GmbH, Richter and Albrecht, 2019; Société Générale, 2016; Erste

Group, 2020; Metro, 2019); therefore, it would be reasonable to check the prevalence of reporting according to the GRI Standards at the banks operating in the Republic of Slovenia.

The aim of this paper is to discuss the applicability of the GRI Standards in the banking sector. To present the topic more transparently, we conducted a SWOT analysis to discuss strengths, weaknesses, opportunities, and threats of implementation of the GRI Standards, as well as some examples of sustainable reporting of banks, operating in Slovenia and abroad, are discussed.

2. Global Reporting Initiative (GRI) Guidelines and Standards

The GRI, Global Reporting Initiative, is perhaps the most recognised format for reporting in which economic, environmental, and social aspects of the business are all covered, that is, sustainability reporting (Klemmensen, 2007, p. 69). In 2006, long before the mandatory implication of the Non-Financial Reporting Directive (2014/95/EU), more than 1000 companies already reported following the GRI Guidelines, most of them were large companies. For some time there have also been guidelines for public institutions (like banks for example), to make it possible for local authorities in particular to adopt an uniform set of principles for sustainability reporting (Klemmensen, 2007, p. 70). Among different disclosure guidelines, the GRI Standards approach characterizes as one of the best practices, for public reporting of economic, social, and environmental impacts and provide information about the beneficial or harmful contribution of institutions to sustainable development (GRI, 2018a). Due to many sustainability indicators included, global recognition and uniformed format of reporting, regardless of sector, we assume GRI Standards are one of the best sustainability reporting methodologies. The GRI Guidelines framework promotes the implementation of a common set of valid and comparable indicators, and therefore allows monitoring performance among different companies and over a longer period of time. Applying the GRI framework directly affects integrity and credibility in the process of the non-financial accountability process, as this is an external approach of assuring the disclosures on sustainability (Avrampon et al., 2019). Kaspereit and Lopatta (2016), also asserted that external assurance, which is in the GRI Guidelines focus on verifying reports presentation of sustainability in a reasonable and harmonised way and also considering the accuracy of report data and general content selection (Kaspereit and Lopatta, 2016).

The GRI reporting guidelines have been developed since 2000, when the first GRI reporting guidelines, GRI G1 were launched. Two years later, in 2002, the next G2 Guidelines were published, and later in 2006, another G3 Guidelines were published with a G3.1 guideline update in 2011. The last, G4 Guidelines were published in 2013, and finally, the GRI Standards were launched in 2016 (GRI, 2018b).

The GRI Standards require the usage of three Universal Standards (series 100) and the topic-specific Standards (series 200, 300, and 400), which relate to the material topics identified exclusively (GRI, 2018c). The modular structure of GRI standards is presented in Table 1.

Furthermore, the GRI Standards can be applied with two different approaches. Under the first one, the GRI Standards can be used as a set of indicators by preparing a sustainability report, consistent with the GRI Standards.

At first, the GRI Standards have been developed with the intention to help in preparing sustainability reports of institutions, which would depend on the Reporting Principles and has been material focused.

The second approach means the usage of selected standards, or parts of standards content with the intention to report specific information, not preparing a report in accordance with the GRI Standards. This alternative is specified as a »GRI-referenced« claim. By usage of this approach, the institution can choose as many or as few claims. If using this approach, the organization chooses as many or as few Standards as needed by its reporting (GRI,

2018c). When an organization uses any of those two ways of using the standards, there are requirements to include the statement or corresponding claim. This is required to be stated in any of the report or other published materials with standards-based disclosures (GRI, 2020d). This is due to ensuring transparency about the application of GRI Standards (GRI, 2018c).

An organisation that would like to use the GRI approach, should follow the reporting criteria in accordance with the GRI Standards. Meeting these criteria means that a harmonised picture of an institution's material topics and related influences is provided in a sustainability report. Each report which is prepared in accordance with GRI Standards needs to include the GRI content index. This index must include the page number or URL for all disclosures being reported in a certain location, e.g., paper-based or electronic (GRI, 2018c). There are two options available for preparing reports in accordance with GRI Standards, core and comprehensive one. Neither of them is pointing to the quality of the information, included in the report or the size of the institution's impacts, but are reflecting the extent to which the GRI Standards have been implemented by reporting.

By the Core option, it is indicated that the sustainability report contains minimum information needed for understanding the material topics of an institution and related impacts, the nature of an institution, as well as managing these. The other option, Comprehensive, is built on the Core option by demanding additional disclosures on the institution's

Table 1: The modular structure of GRI Standards for sustainability reporting

Universal Standards - 100 series			
GRI 101: Foundation	GRI 102: General Disclosure	GRI 103: Management Approach	
Topic-specific Standards			
200 Series Economic	300 Series Environmental	400 Series Social	
GRI 201: Economic Performance	GRI 301: Materials	GRI 401: Employment	GRI 410: Security Practices
GRI 202: Market Presence	GRI 302: Energy	GRI 402: Labor/Management Relations	GRI 411: Rights of Indigenous Peoples
GRI 203: Indirect Economic Impacts	GRI 303: Water	GRI 403: Occupational Health and Safety	GRI 412: Human Rights Assessment
GRI 204: Procurement Practices	GRI 304: Biodiversity	GRI 404: Training and Education	GRI 413: Local Communities
GRI 205: Anti-corruption 2016	GRI 305: Emissions	GRI 405: Diversity and Equal Opportunity	GRI 414: Supplier Social Assessment
GRI 206: Anti-competitive Behavior	GRI 306: Effluents and Waste	GRI 406: Non-discrimination	GRI 415: Public Policy
	GRI 307: Environmental Compliance	GRI 407: Freedom of Association and Collective Bargaining	GRI 416: Customer Health and Safety
	GRI 308: Supplier Environmental Assessment	GRI 408: Child Labor	GRI 417: Marketing and Labeling
		GRI 409: Forced or Compulsory Labor	GRI 418: Customer Privacy
			GRI 419: Socioeconomic Compliance

Source: (Rimmel, 2020)

strategy, governance, integrity, and ethics. The institution is also required to report to the larger extent on its impacts by reporting on all the topic-specific disclosures for each of the material topics which the GRI Standards cover. An option that meets its reporting requirements and meets stakeholders' information needs should be chosen, therefore a progression from the Core to the Comprehensive option is not required (GRI, 2018c).

3 Discussion

As investors and stakeholders demand increased disclosure of sustainability risks and opportunities, frameworks for non-financial reporting have proliferated. The meaning of non-financial reporting-boosted after the Financial Crisis 2007-2008, when companies started to detect non-financial reporting as an opportunity, not a threat (Giannarakis and Theotokas, 2011).

We have reviewed the GRI Standards to discuss their potential applicability in the banking sector. Moreover, we have reviewed some selected cases of sustainability reporting in the selected foreign European banks, namely Deutsche Bank, BNP Paribas, UBS, Danske Bank, Swedbank, Commerzbank AG, Societe Generale Group, Erste Group, Credit Suisse, and eleven banks operating in Slovenia (Banka Slovenije, 2020). Based on this review and the overview of the GRI standard sustainable criteria, we have prepared the SWOT analysis. The aim of such presentation is to present the GRI Standards from the point of their applicability to institutions. Namely, the SWOT analysis can represent a valuable tool for discussing strengths, weaknesses, opportunities, and threats of applicability even to the banking sector.

Applying GRI Standards to non-financial reporting does not mean that reports of different banks are comparable because the target values are not written in the criteria (Table 2). Reporting on sustainability in compliance with GRI Standards should be considered as a possibility of comprehensive reporting (Table 2). Foreign banks, like Danske Bank, which incorporated Sustainable Development Goals indicators (Danske Bank, 2020), upgrade their reporting with various documents to report on corporate social responsibility, climate change, environmental management, human resources and separate them from annual reports.

Accordingly, the GRI Standards are appropriate to be incorporated in the banking sector. Deutsche Bank, BNP Paribas, UBS, Danske Bank, Swedbank, Commerzbank AG, Société Générale Group, Erste Group, Credit Suisse are some examples of European banks that were first to actively apply the GRI Standards or the GRI Guidelines to

their non-financial reporting and have good practices for operating sustainably and reporting on this issue (Deutsche Bank, 2020; BNP Paribas, 2019; UBS, 2020a; Danske Bank Group, 2015; Swedbank, 2020; Ernst & Young GmbH, Richter and Albrecht, 2019; Société Générale, 2016; Erste Group, 2020; Metro, 2019). Besides, UBS is also certified with ISO 14001 certificate, ISO 50001 certificate, and, ISO 30001 certificate (UBS, 2020b). For this reason, we suppose that the bank is aware of the strengths of harmonization of the non-financial reporting and its standardisation within the official standardisation body. (Table 2). Among banks and subsidiaries operating in Slovenia, only Nova KBM d.d. and NLB are reporting in accordance with the GRI Standards (until merging with Nova KBM d.d, also Abanka d.d. did) and issuing sustainability report as additional report to regular annual report (Nova KBM, 2020; NLB, 2020; Abanka, 2020). Kundid Novokmet and Rogošić (2016) stated that issuing reports for the whole group of banks is a problem because such reports are too integrated and thus the transparency is lost, as well as key information (Kundid Novokmet & Rogošić, 2016). We detected the same issue by banks, operating in Slovenia. The banks Intesa Sanpaolo, Kärntner Sparkasse AG, Sberbank, Unicredit, and OTP Bank, have issued or are still issuing non-financial reports based on the GRI Standards for their whole groups, and then their subsidiaries in Slovenia do not report on sustainability in separate reports (GRI, 2020a-c; GRI, 2020e; GRI, 2020f).

As Pennington (2008) reported, some well-known banks saw the opportunity in continuous improvement in a way of sustainable development of an organisation (Table 2) years ago. For example, UK bank Lloyds TSB has already had a specific policy and process for calculating environmental risks across its lending portfolio since 1990s (Pennington, 2008). Furthermore, analysts from global systematically important banks, namely Deutsche Bank, Citibank, as well as Hongkong and Shanghai Banking Corporation, raised questions regarding further investments in coal due to financial reasons (Gangi et al., 2019). Such a measure could strengthen the environmental policy of an institution (Table 2). Additionally, reporting in compliance with the GRI Standards also has various benefits for financial institutions, such as emphasising the connection between financial and non-financial performance, boosting efficiency, cost reductions, and influencing long-term management strategy and policy, together with business plans (Kundid Novokmet and Rogošić, 2016). According to Zimara and Eidam (2015), better recognition of risks and opportunities, expanding and securing social capital, and facilitation of benchmarking are also advantages.

Table 2: SWOT analysis of the applicability sustainability reporting in banks based on GRI Standards

Strengths	Weaknesses
<ul style="list-style-type: none"> Pointed out by Directive 2014/95/EU Uniform format of reporting about sustainability regardless of the sector Applicable to different sectors Criteria are segmented, but also aligned with global sustainability goals: economics, environment, and society Many sustainability indicators included The company which is compliant with GRI is more aware of sustainability goals – better image for stakeholders Developed by a reputable organisation Widely globally recognised Publicly available application instructions and descriptions of the standards 	<ul style="list-style-type: none"> It is not known what the target values are, they are not written in the criteria Could be too complex for small companies Time-consuming data collection Too many indicators could repel management from using them It does not say how much profit this will bring (descriptive) The method is not standardised by official standardisation body (EN-ISO or ISO) Credibility check of this information - it is not known who designs this Exclusion of certain processes or activities from the environmental impact assessment Possibility of trials due to disclosures that were not known in the past
Opportunities	Threats
<ul style="list-style-type: none"> It may be the basis of continuous improvement in a way of sustainable development of an organisation It can strengthen environmental policy communication of an organisation It gives the possibility of comprehensive reporting A company can get better reputation in the eyes of stakeholders – be perceived as more trustworthy The company is more prepared for future changes in legislation in the field of sustainable reporting A company could be more attractive for institutional investors (e.g. pension funds) due to a better record of sustainable risks and opportunities 	<ul style="list-style-type: none"> It does not guarantee comparability because the criteria are not exactly prescribed - due to arbitration Flexible to some point: 2 different options of reporting – core & comprehensive Selective selection of indicators can lead to greenwashing, intentional or unintentional The most relevant criteria for the organisation can be missed out due to the subjective selection of less relevant criteria for reporting

Given the fact that the sample of the banks discussed in the paper is small, the findings should not be generalised and could be extended for an in-depth study. Nevertheless, the results are still useful because we have shown that banks abroad already report on sustainability in accordance with the GRI Standards. There is still a lot of room for manoeuvre in Slovenia, as the GRI Standards are not widely applied. First, it would be important for other banks to focus on reporting on sustainability that would be segmented into specific topics and a uniform format of reporting about sustainability (Table 2). If banks want to compete with the global players, raise reputation in the eyes of stakeholders and shareholders, improve image and eventually satisfy increasingly stricter requirements laid down in legislation (Table 2), they should pay more attention to good practices from abroad and report in even more detail, including issuing additional reports and standardise reporting. Banks that apply the GRI Standards need to be aware of the threats of applying such standards, like greenwashing and not recognising the relevant criteria for the bank and should consider this as a basis of continuous improvement in a way of their sustainable development (Table 2).

4 Conclusion/Concluding remarks

Banks contribute to the pollution of the environment directly by conducting their operations and indirectly by investing in polluting industries. Nowadays, sustainability is an important part of each business, as well as reporting on it. Many efforts have been made in this sphere by foreign banks that apply the GRI Standards as the basis of their sustainability reporting and upgrade it with additional disclosures, communicating detailed information in several reports. By the banks operating in the Republic of Slovenia, reporting on sustainability is present, but only two of the examined banks (Nova KBM and NLB) are reporting on this issue in accordance with the GRI Standards. Due to continuous legislation tightening and ever-increasing regulatory requirements, competitiveness, the reputation of stakeholders and shareholders, we suggest paying more attention to their approach and harmonization of reporting on sustainability. Here, GRI Standards represent good practice, because when reporting in accordance with them, topics are clearly divided, but still aligned with global sustainability goals. On the other hand, data collection can be time-consuming, and many indicators could distract management from using them. Furthermore, disclosing the

information through many indicators may be the basis of continuous improvement in a way of sustainable development of the banks and strengthen their environmental policy communication. If banks decide to apply GRI Standards, it is important to recognize the most relevant criteria or use them to avoid greenwashing, while building a better image.

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Assessment of circular and linear risks of the banking portfolio and implications on banks' capital requirements

*Slaven Mičković and Jurij Giacomelli **

The awareness that conventional business practices that follow a 'take-make-dispose' approach – what we term the 'linear economy' – disregard an increasingly relevant dimension of the understanding of risk, has significantly increased in the last years. If we continue to follow this still dominant way of business conduct, which is based mostly on the linear approach, the outcome will be shortages of inputs, their growing price volatility and continued environmental degradation. Needless to add that social consequences will be disastrous. However, a number of business risks arising from the 'linear economy' practices are still mostly overlooked and are not part of traditional risk evaluation approaches.

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Our aim

Besides the fact that our main aim is to promote and accelerate the transition to the circular economy, we are aware that the circular economy and sustainable finance are two mutually enabling policies supporting the required global transformation.

Having that in mind, our goal is also to inspire circular economy practitioners to engage in the enhancement of frameworks for sustainable finance, and to motivate sustainable finance actors to integrate circular economy issues into the sustainable finance agenda.

1. Early methodological approach to circularity risk assessment

A transition to the circular economy, an emerging economic and social concept that requires new business models and strategies to continuously reuse materials and resources to their best potential, appears to be a potential solution to diminish 'linear risks'. As the shift to the circular economy is becoming a must due to the planetary boundaries we are facing at the global level, the understanding of the risk profile of the corporate sector has

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started to change. The financial sector needs to adapt to these changes to be able to include all aspects of risk in investment decisions and offer the products and services businesses need.

Despite the emergence of methodologies, which help distinguish between linear and circular risks and better understand both these risk aspects, their full inclusion into the risk modelling and calculation remains challenging, given the lack of data, their long-term nature, a number of assumptions that need to be made and the know-how to fully assess the risk profile of firm under such altered point of view. Analytical and modelling tools to quantify the costs and benefits of “circular” projects are still in their infancy. The lack of a common taxonomy¹, standard methodologies for reporting and information makes a risk analysis even more difficult.

Credit risk measuring starts with the creditworthiness of the borrower. Banks with internal rating systems group borrowers into rating grades according to their credit risk characteristics. Current risk assessment methodologies are insufficiently developed to sense the shift of perspective. As a consequence, they are generally biased towards firms practicing linear business models, while they overexpose risks associated with firms practicing circular business models or projects². Here are the reasons why:

1. For the “linear industry”, or linear business models, they do not always identify risks of remaining in the linear model, which are associated with a number of interrelated factors such as a negative impact on the environment, a shift in societal choices and preferences, structural shift of regulatory and taxation environment, etc.
2. Existing models insufficiently capture the specific financial profile of circular business models due to issues related to asset ownership, cash flow dynamics, depreciation and fail to value the benefits and risk mitigants of circularity.

The fact that circular risks can potentially endanger the stability of the financial sector and they are only marginally addressed by Basel capital requirements, has an additional negative impact on the lending to circular projects which

are by nature mid to long-term projects. Since the banks continue to play a crucial role in the transition to a more sustainable and a more circular future acting as borrowers, investors and intermediaries providing capital for their scaling, they need to join forces with regulators, supervisors and other stakeholders to develop common standards as soon as possible. From a regulatory perspective, and based upon an empirical analysis, this should result in balancing capital requirements between linear and circular projects, lowering those for direct financing of circular business models.

In this study, we focus on two possible channels of integration of circular risks into banks’ capital requirements:

1. **Circular Supporting Factor (CSF)** relieves capital requirements for circular projects, making them more attractive and consequently contributing to close the circular finance gap.
2. **Linear Penalising Factor (LPF)** reduces attractiveness of loans to linear projects and helps banks bear losses from the materialisation of circular risks.

In order to fully integrate linear and circular risks in banks’ balance sheets (“delinearisation” of bank balance sheets), a possibility of combining both factors is also assessed in this paper. A combination of CSF and LPF would result in recalibration of the risk weight factors of all assets and should assure capital neutrality at the starting point.

Since both factors must be quantified, it is necessary to accurately measure the level of linear and circular risks associated with each asset. In this paper we propose the use of the currently available tool, the Circularity Assessment Score (CAS)³, used for the quantification of the different aspects of firm’s circular business model potential and managerial abilities to seize that potential, or the firm’s commitment to it.

The Circularity Assessment Score tool is elaborated in more details in dedicated chapters.

The challenges to integrate linear and circular risks into banks’ capital requirements, while maintaining banks’ financial stability, are also discussed in paper.

2. Circular finance in the regulatory framework of banks

While a lack of common taxonomy and data are obstacles to faster transition to the circular economy, there is also a lack of internal incentives to channel funds into the areas of Circular Finance. Among others, this limits banks efforts to allocate funds to circularly sound projects and generation

¹ The understanding of challenges related to sustainability and the circular transition in particular has recently been accelerated the EU. In March 2020 the final document prepared by the technical group of experts was prepared: Taxonomy: Final report of the Technical Expert Group on Sustainable Finance, considered a key piece of legislation that contributes to the European Green Deal by boosting private sector investment in green and sustainable projects. The Taxonomy Regulation was meanwhile adopted by the European Parliament in June 2020. Link: https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-eg-final-report-taxonomy_en.pdf
EIB published a very useful The EIB Circular Economy Guide, Supporting the circular transition, in May 2020. Link: https://www.eib.org/attachments/thematic/circular_economy_guide_en.pdf

² The same can be said for sustainable businesses at large. Here we note that a clear distinction should be made between the concept of sustainability and the concept of circularity.

³ The Circularity Assessment Score (CAS) or model is intellectual property of Gm (Giacomelli media management and consulting Ltd).

of new circular projects as the credit supply and raising capital for circular investment is currently, in most cases, not economic, given the absence of government incentives. The implementation of an adequate system of incentives to lend more to projects that have a direct and positive beneficial impact on the transition to the circular economy, would

banks would more easily finance circular projects, which would become more profitable with the lower capital requirement. The factor could be applied in the capital requirement of a bank as shown for example in the simplified equation below, where α corresponds to the risk-weight of an asset:

$$CAR_{circular}^t = \frac{\text{Bank's Capital}_t}{RWA_t} = \frac{\text{Bank's Capital}_t}{\alpha_{linear} \cdot L_t^{linear} + (\alpha_{circular} - CSF) \cdot L_t^{circular}} \geq \beta$$

act as catalyst for the public sustainable policies, bearing in mind the role banks can play as transmitters of political economic impulses on sustainable matters. Importantly, incentives should always consider the materialisation of the associated risk and their impact on the EU financial system. With a lack of evidence on the positive correlation between enterprises which are less exposed to linear risks and their financial performance, the cost of financing the transition to the circular economy remains a major challenge. To support and accelerate the financing of these enterprises in an economy where more than 70% of finance comes from banks, it is necessary to keep working on the recognition of the beneficial nature of this transition.

From a regulatory perspective, and after an empirical analysis, this should result in lowering capital requirements for direct financing of these enterprises and investment in circular projects. The idea of adjusting banks' capital requirements is linked to two objectives: incorporating circular risks in the bank's risk assessment and filling in the existing circular investment gap to support the transition to more sustainable economy.

The prudential calibration for circular (and sustainable) financing must be consistent with the associated financial risks of the projects and investments. Financial stability, which is the goal of macroprudential policies, must always be ensured. For that reason, the capital required must be enough to cope appropriately with the materialisation of the associated risks. To achieve this, the possibility of introducing a Circular Supporting Factor and/or Linear Penalising Factor should be analysed and discussed.

I. The Circular Supporting Factor relieves capital requirements for circular-friendly projects, making them more profitable and trying to close the circular finance gap. The idea behind the GSF, is to reduce the capital adequacy ratio for projects classified as circular. In other words, a factor would be applied to lower the risk weight of green assets, reducing the capital requirement of these assets and consequently the overall capital adequacy ratio (CAR) of the bank. It is expected that

where RWA_t is bank's risk-weighted assets, $\alpha_{linear} \cdot L_t^{linear}$ and $\alpha_{circular} \cdot L_t^{circular}$ are respectively the linear and the circular risk-weighted loans portfolios, and β is the CAR set by regulator.

The CSF has been criticised and opponents of the idea warn it should be considered with caution. The limited empirical evidence regarding the lower risk of circular assets augments the fear of inadequately reducing bank's capital and possibly creating systematic financial instability. Moreover, the negative impact of a CSF on bank's capital is put forward by the opponents of this measure because it would reduce bank's resilience to shock.

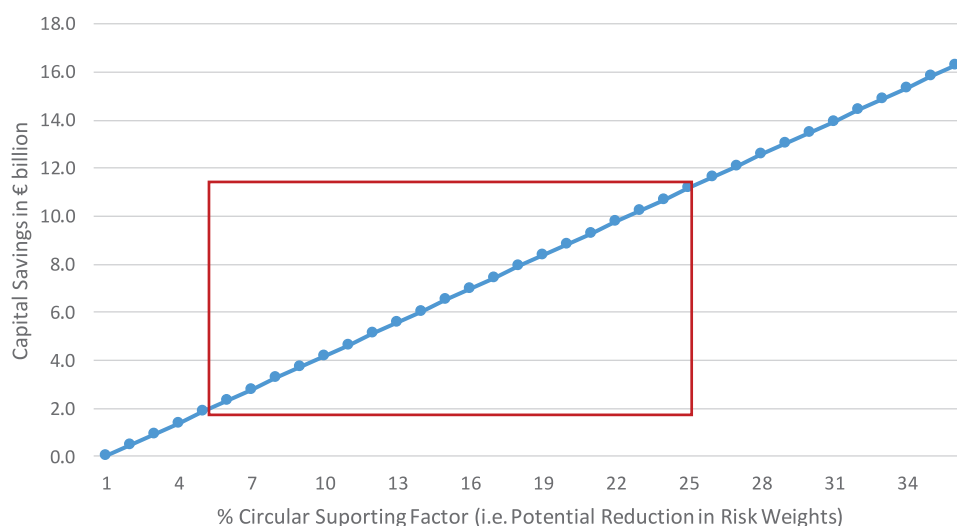
And last but not least, the reduction of capital requirements for circular assets could eventually create a "circular bubble" in the market. That means projects without real economic value or proper evaluation of their risks might end up being approved only because of the capital relief. This bubble could lead to the development of "circular washing", where any project with a minimum level of sustainability would try and attract the capital requirement bonus. In order to quantify the impact of a Circular Supporting Factor on the capital of EU banks, we use information available from the European Central Bank. Table 1 presents asset breakdown on banks' balance sheets by type of instrument including appropriate risk weights. For the purpose of this article, the share of "circular" and "linear" assets within each of these instruments was assumed. The risk-weighted value of the respective assets is estimated at roughly €734.5bn, implying a current total capital charge of €58.8bn (assuming an 8 per cent total capital charge). The total impact of a CSF in the range between 5-25 per cent is estimated to be between €2.3-11.6bn in capital savings (Figure 1).

II. In response to the CSF, the idea of introducing Linear Penalising Factor (LPF) instead has been put forward by others. The mechanism of the LPF is very similar to the CSF and it would be included as a component in the calculation of the risk-weight assets of linear loans. the LPF would be added up to the current risk-weight and

Estimated selected financial assets of European banks

Type of instrument	Total (in billion €)	Risk Weight (in billion €)	RWA	Circular share (%)	Linear share %	RWA circular (in billion €)
Loans financial corporations	1,047.0	20.0	209.4	0	0	0
Loans non-financial corporations (large)	2,848.0	100.0	2,848.0	10	30	284.8
Loans non-financial corporations (SMEs)	1,500.0	100.0	1,500.0	5	10	75
Consumer credit	654.0	100.0	654.0	0	0	0
Loans - house purchase	4,220.0	50.0	2,110.0	0	0	0
Other loans - household	723.0	100.0	723.0	0	0	0
Loans government	1,016.0	100.0	1,016.0	0	0	0
Loans non-euro area residents	2,898.0	100.0	2,898.0	5	10	144.9
Equity funds	1,532.0	300.0	4,596.0	5	10	229.8
Government debt securities	1,505.0	20.0	301.0	0	0	0
MFI debt securities	970.0	20.0	194.0	0	0	0
Debt securities - non-euro area residents	2,151.0	100.0	2,151.0	0	0	0
TOTAL	21,064.0		19,200.4			734.5
CAPITAL DIFFERENCE			1,536.0			58.8

Figure 1. Estimated impact of application of a CSF



increase the RWAs of this class of loans as shown by the example of the simplified equation below.

Second, by penalising a certain group of assets, the measure is not considered to be forward looking

$$CAR_{linear}^t = \frac{\text{Bank's Capital}_t}{RWA_t} = \frac{\text{Bank's Capital}_t}{(\alpha_{linear} - LPF) \cdot L_t^{linear} + \alpha_{circular} \cdot L_t^{circular}} \geq \beta$$

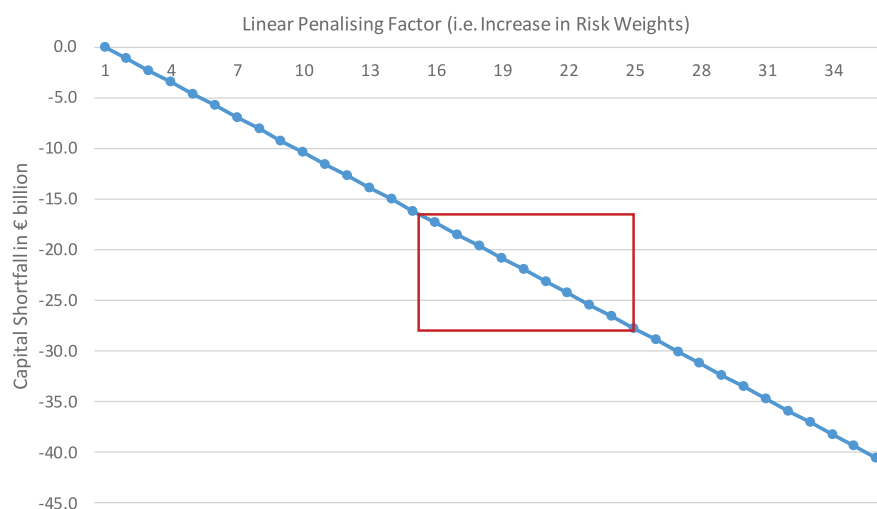
The Linear Penalising Factor could reduce credits to linear activities and help banks to bear losses from the materialisation of linear risks.

However, the LPF has also attracted several criticisms. First, from a political acceptability perspective the adoption of a LPF could be challenging. As the name implies, it punishes linear activities, so reaching a political consensus to adopt a methodology that penalises major economic sectors would not be an easy task.

concerning the transition to circular economy.

Third, the LPF would not stimulate the financial system to invest in technologies and ideas that will contribute to mitigate linear risks or increase resilience to it. Indeed, even if a reduction in credit to linear activities is obtained, a LPF would not necessarily support circular credits which are needed to finance the transition to a circular economy but also benefit to any other type of activities.

Figure 2. Estimated impact of a linear penalising factor on capital of EU banks



Fourth, a study based on interviews with regulators evidenced that higher capital requirements are likely to have a marginal influence on bank lending. In other words, a LPF would not necessarily significantly decrease the volume of lending to linear activities if banks are enough capitalised to comply with the prudential requirements.

Figure 2 shows the potential capital shortfall in billion euros under various levels of “penalty” imposed to linear loans. As shown above, the idea of the CSF or the LPF is still controversial. In short, while by applying the CSF we would risk funding too many project that could be declaratively “circular”, but could end up in a default as a consequence of adverse selection, the opposite could happen by applying the LPF, which would discourage lending to potentially sound projects.

3. Change of paradigm, change of perspective on risk

For this reason, a third option is also considered which implies an **integral approach**. Its logic is based on the fact that by recognising linear and circular risks in the economy, we adopt the change of perspective on the evaluation of business risks all together.

One single, integral factor would therefore “adjust” risk assessments currently in use and would subsequently “adjust” banks’ capital requirements. This solution would create at the same time a bonus and a penalty factor, with the aim of shifting credit allocation from linear to circular activities. From a risk perspective, this integral factor would make more sense than each taken separately. For example, an observed firm can the same time positively or negatively impact linear and circular aspects of risk. In general, we can assume that some correlation exists between linear and circular aspects of risks in every examined case. In other

words, when we change the perspective and recognise the degree of a firm’s circularity, every component of risk changes. Consequently, when assessing the risk of a financing proposal, or a project to be assumed by the observed firm, we have to re-evaluate all its risk components. Capital requirements should in this case be readjusted to accurately reflect the risk of the underlying exposure.

By linear or circular risks, we understand risks connected with linear or circular business models and not necessarily new types of risk. To better illustrate the change of perspective, let us have an overview of circular and linear risks in the Table 2 below.

A mechanism which incorporates in essence the idea of combining the benefits of both the CSF and LPF into a single, integrative factor, would simply be superimposed to the current calculation of capital requirement for all assets instead of substituting the current methodology only for a part of them. These leads to single **Integral Factor**⁴ which adjusts the capital allocation to the degree of sustainability of each asset according to its circular and linear impacts. To cover a range of shades from linear to circular risks with different risk level associated to each asset, the CAS model (model quantifies level of circularity) could be upgraded and used.

When a firm is deemed circular?

A circular business model articulates the logic of how an organisation creates, offers, and delivers value to its broader range of stakeholders while minimising environmental and social costs by following the principles of circularity aiming at slowing narrowing and closing the loops.

⁴ By the term «**Integral Factor**» we understand a single, «**Circular Weighting Factor**», which derives from an integral approach of circularity assessment and could be applied in a combined way, both as a linear penalising factor and as a circular supporting factor in the manner as explained above.

Table 2: Circular and linear risks

Circular risk	Linear risk
Shift of mindset 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, page 74. The Netherlands, March 2016.

Link (Ellen MacArthur Foundation): <https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/FinanCE.pdf>

Conceptually, a firm is incentivized to balance its linear and circular risks by undergoing a business model transformation from the linear to the circular. By doing so it increases its degree of **circularity**. “Value Hill” reference is often made to three circular business model categories, each of which focuses on a different phase of a **value chain of a firm (or an industry)**: (a) the design and manufacturing phase; (b) the use phase; and (c) the value recovery phase. These different CE business models can be presented as a Value Hill. Table 3 illustrates a widely accepted typology of circular business models.

Unlike the economy as a whole, for a firm to be considered circular, that is, to practice a circular business model, it does not need to maximise its capability to recover and regenerate resources deployed within its own value-creating processes. Circularity as a firm’s strategic orientation, exercised through the functioning of an organisation according to circular business models, is manifested by a set of criteria demonstrating to that extent a firm uses its capabilities to contribute to the circular economy.

We assume that advancing in the circular business model transformation is an innovation process with the purpose to increase their value creation and diminish business risk, while increasing their environmental and social level of sustainability. In order to evaluate the relationship between the circular transformation of a business model and the value creation in a firm, we must consider the composite nature of the circular transformation and its long-term impact on the economic value creation.

The circularity of a firm assessed through its application of a circular business model is manifested by its potential to

sustainably contribute to the circular economy and capabilities of a firm to seize it.

To evaluate the degree of circularity, we apply a **Circularity Assessment Score (CAS)** - a composite measure of multiple criteria, allowing to assess the potential and the ability of closing, narrowing or slowing the loops, based on a standardised and validated questionnaire.

How does the Circularity Assessment Score work?

Circularity assessment model, or **Circularity Assessment Score (CAS)** is a composite measurement tool which supports the assessment of the level of maturity of target firms for the circular transformation. It is a composite measure based on multiple criteria, allowing to assess the potential and the ability of closing, narrowing or slowing the loops. It is based on a standardised and validated questionnaire, by which we can evaluate the degree of circularity of a SME’s business model.

Circularity Assessment Score (CAS) is based on an in-company business review made by the use of a questionnaire survey. CAS is a two-dimensional measurement, which on one hand evaluates the **circularity potential** of the currently deployed business model in a firm, while on the other hand it assess the level of exploitation of this potential, or the firm’s actual level of **commitment** to the seize this circular potential. **A sum of both partial scores shows the level of advancement of the firm in the circular transformation process⁵.**

⁵ A quick version of the CAS questionnaire is freely available here: <https://www.circularbusiness.academy/#score>.

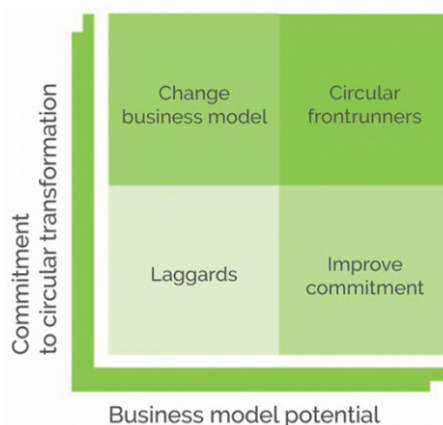
Table 3: Typology of circular business models

<p>Circular Design Models focus on the development of existing or new products, services and processes that seek to optimize circularity. Products are designed to last longer and/or be easy to maintain, repair, upgrade, refurbish, re-manufacture or recycle. New materials are developed and sourced, being either bio based, less resource intensive, or fully reusable. Risks related to financing such innovations are similar to those of financing Research, Development and Innovation (RDI) projects or innovative early-stage firms.</p>	<p>Optimal Use Models aim to increase the value and use of a product during an extended life. These business models often build on retained ownership of a product, e.g. by providing a service rather than selling a product (product-to-service systems, or PSS), and define responsibility for the product throughout its useful life either by producer or by customer, e.g. through maintenance services, or add-ons to extend the life of a product. Such product-to-service models have financial implications coming from, for instance, the changing nature of cash flows, with increasing working capital to pre-finance clients, balance sheet extension, and re-evaluation of residual value. Related challenges lie in product tracking and legal issues surrounding ownership of collateral and its value, what impacts the risk assessment of this type of circular business models.</p>
<p>Circular Support Models focus on the management and coordination of circular value networks and resource flows and optimizing incentives and other supporting activities in a circular network. These models also include the development or deployment of key enabling technologies supporting, enabling and facilitating the other business models.</p>	<p>Value Recovery Models focus on maximizing value from recovery and reuse of products and materials after the end of their life by transforming them into inputs for new products and services or decompose them and reuse their resources in order to reduce waste and conservation. The development of reverse logistics, i.e. the return from point of consumption to point of production, is essential for this model. A difference can be made between downcycling, which results in lesser quality and reduced functionality, and upcycling, which involves transforming by-products and waste into new materials or products of higher quality or better environmental value.</p>

Source: Elisa Achterberg, Jeroen Hinfelaar, Nancy Bocken: *The Value Hill Business Model Tool: identifying gaps and opportunities in a circular network*.

Link: <https://www.scienceandtheenergychallenge.nl/sites/default/files/workshops/attachments/NOW%20Sc4CE%20-%20Workshop%20Business%20Models%20-%20Paper%20on%20Circular%20Business%20Models.pdf>

Picture 1: The CAS Matrix



Source: Circular Business Academy; Link: <https://www.circularbusiness.academy/>

The CAS survey enables to define **the type of the circular business model** by returning its profile and exposes the challenges ahead of the company. It represents a practical, yet universally representative measurement of the ability to closing, narrowing or slowing the loops. Such ability is manifested by a consistent set of competencies, relations, organisational and management practices, aiming at such a desired effect.

Circularity potential represented by the CAS's x-axis is based on the assessment of a firm's business model along the value chain. The CAS's partial score represented on the

y-axis is a result of an assessment of several aspects of **commitment**, which derive from the organisational competencies and managerial practices.

CAS partial scores (Circular business model potential and Commitment to circular model transformation) are normalised to 50 points each. So, the total CAS score as a sum of both partial scores equals a maximum of 100 points. When score is summed up, CAS may be used to monitor the progress of a single firm, an entire industry segment, a cluster or an industry sector as a whole. It may therefore be used at the aggregate level by different participants in the

circular transition, who assume different roles in the transformation process. While executives and general managers or business consultants are more focused on the advancement of single businesses or a group of companies collaborating within the same value chain, researchers, technology experts, communication and exploitation professionals, product and project managers or policy-makers may use CAS to monitor progress at different composite levels.

Applying CAS as Integral Factor

CAS can be deployed as a tool for the assessment of companies' maturity to advance in the transformation towards the increased circularity and helps monitoring a firm's progress in the circular transformation process. So, not only it can be applied as the **Integral Factor** by which we can adjust risk assessment of observed companies and projects under scrutiny in our banking or investment portfolio. It can just as well be applied as a monitoring measurement in the period of contract fulfilment.

More precisely, to do so, apart from assessing the risks to which a firm is exposed as such, before undertaking a new project, we need to understand the effects that this project, which we are considering to finance, may have on the firm's – and the lender's – risk exposure. So, first, we assess the firm's circular maturity by evaluation its CAS score before undertaking the project. Next, we must establish, what effects on the firm's CAS score would the financing project have. This means that we proceed with the evaluation of the effects that the CAS score will have on the firm's circularity. Will the project, if undertaken, contribute to an improvement of the CAS score, and will therefore have an effect of the Circular Supporting Factor? And vice versa, if the effect is a decrease in the CAS score, this can affect capital requirements in the same way as demonstrated before for the Linear Penalising Factor.

Challenges

The major challenge in the application of CAS arises from its complexity. Undoubtedly, CAS aims at evaluating a firm's circular maturity in a comprehensive and practical way. It focuses on a business model transformation and this is a complex and forward-looking process. Particularly, assessing the circularity potential of a business model, even at different hypothetical circumstances – of a certain project is undertaken or not – requires a significant amount of conceptual thinking and thorough financial analysis. This leads to the second challenge, to the need to develop a new competence in the lending (credit) process. A bank should develop a capability to observe its clients' business model transformations and should actively support these

processes through systematic analysis, assessment, monitoring activities and corrective measures, if needed. This is much more like advisory job along with the lenders' one and is turning into banks' competitive advantage. Circularity is not a niche topic anymore, it is becoming a mainstream, so an investment into such competence should well pay off. Needless to emphasise, though, that the development of such a competence requires a conscious strategic shift and persistent effort from every single bank. Such a learning process needs to be supported by the regulatory environment, and banks should be instructed and guided in this process by the regulator.

Beyond the choice of which mechanism should be enforced (CSF, LPF, or IF) lies the issue of developing a risk metrics to overcome the fundamental uncertainty that challenges the banking industry with respect to the transition to a more circular economy: the capital adequacy. Could a shift in perspective on risk mean that we have been disregarding certain components of risk?

Actually, not. The recognition of circular and linear risks does not mean that we have been disregarding a certain type of risk. They affect our understanding of all business risks. In other words, paying a fair recognition to circular and linear risks does not mean that the banking industry, as a whole, is undercapitalised. It is possible, however, that risk exposure is inadequately assessed and that banks' capital requirements today are skewed as they may favour lending to "linear" project over "circular" ones as a consequence of inadequate risk assessment models currently in use.

It's time for a shift, otherwise we will continue supporting linear incumbents at the expense of penalising circular frontrunners. A more adequate risk assessment should, on average, not result in an increase of capital requirements, but can save banks from losses in the future.

In theory, a part of the assets (notably the "linear" ones) would potentially bear additional risks and therefore require additional capital. Another part of the assets would not bear additional risks in relation with circularity and/or linearity and should not require additional capital. To achieve that the more "circular" part of assets require less capital it is necessary to upgrade the credit-risk assessment methodology in order to be more sensitive to the specific nature of the risks posed by the circular/linear component of projects or entire projects. In such a way we will be able to identify and recognise the remaining risks components of in the linear model, value the benefits/risk mitigants of circularity and ultimately reduce the barriers preventing access to finance for circular businesses and projects.

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NLB Group on the Road to Sustainable Banking - Experiences and Challenges of Introducing Sustainability into the Bank's Business Model

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Moving to a sustainable economy is no doubt the challenge of our time. Ever-increasing greenhouse gas emissions are warming the planet, changing the climate, and threatening human life. With the Coronavirus crisis, it became even clearer that banks need to accelerate financing of a low-carbon economy and at the same time develop a vision of what a climate-progressive bank should look like.

In 2020, the NLB Group embarked on a path of more intensive integration of sustainability into banking operations. If until this year it was possible to detect the activities of banks in the Slovenian financial sector in the direction of more socially and ecologically acceptable operations, the Covid-19 pandemic strengthened banking agendas related to climate risk management and thus more comprehensive implementation of the ESG (Environmental, Social, Governance) factors. This presents a new challenge for banks, as it has become more than evident that a CSR (Corporate Social Responsibility) policy extended to the field of environmental protection alone will simply not be enough. The transition to sustainable banking requires the adaptation of most banking processes, as well as changes in the banking culture.

1. Upgrading NLB Group's Corporate Social Responsibility with UN Sustainable Development Goals

The NLB Group's social role has been stipulated in its Social and Environmental Policy, which has paved the way for more than a decade's work on sustainability.¹ However, the bank's ambition is to increasingly focus on ESG integration and translate it into real value-added.

In 2020, the NLB Group's CSR has been continuously upgraded with projects which follow the United Nations Sustainability Development Goals² (UN SDG). The first NLB Group regional CSR project following UN SDG was launched in spring 2020. "Help Frame Project" intensively addresses the bank's environmental and social role in all markets of the NLB Group, as the goal is to establish a regional sustainability platform. The project provides advertising space to selected local entrepreneurs, farmers, as well as micro and small companies, thus helping their

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¹ <https://www.nlb.si/social-responsibility>.

² As defined by UN, the Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice. The 17 Goals are all interconnected, and in order to leave no one behind, it is important that we achieve them all by 2030 (referring to Agenda 2030).



Source: <https://news.un.org/en/story/2016/03/524202-un-statistical-body-agrees-global-indicators-measure-sustainable-development>.

business to recover from the Covid-19 pandemic. NLB Group plans to continue carrying out the CSR activities in accordance with UN SDG.

2. International regulatory environment

Most of the developments in the field of sustainability regulation in banking are taking place at the level of the EU institutions. The harmonisation of national legislation is expected to follow suit with a certain delay. However, this does not mean that the NLB Group is waiting passively. The NLB Group systematically follows the emerging regulations in the field of sustainability, and at the same time regularly monitors recommendations and guidelines from leading financial institutions and authorities. Plans, how to integrate the new regulation into the NLB Group's operations, are prepared, thus credibly meeting the expectations of key stakeholders. In May 2020, the European Central Bank (ECB) published the document "Guide on climate-related and environmental risks", which among others aims to encourage banks to take a timely approach to managing ESG risks. In the guidelines, the ECB expects banks to comprehensively define the framework for the inclusion of ESG factors in their business strategy, and afterwards to integrate it into their risk management and business decision-making. The green transition also brings many business opportunities. Therefore, banks are preparing for the implementation of the EU Sustainable Finance Taxonomy, which will standardise definitions of sustainable investments. It can be argued with great certainty that the lack of standardisation of definitions and processes in recent years is very likely to have hampered the growth of sustainable investments. The abundance of overlapping non-binding

standards inhibited a meaningful comparison between investments.

Now, the EU is finally introducing standardised definitions through its recently published EU Taxonomy³. It is also adopting standardised processes through its Sustainable Finance Disclosure Regulation (SFDR)⁴. This binding regulation forms part of an ESG initiative designed to channel funding to genuinely sustainable rather than greenwashed investments, thereby facilitating compliance with Paris Agreement climate targets and the EU commitment to UN SDG.

3. Performance standards and requirements of international financial institutions

The shareholders of the NLB Group are reputable international financial institutions that are aware of the importance of sustainable development and therefore encourage and expect it. One of them, the European Bank for Reconstruction and Development (EBRD) has a significant impact in implementing sustainability to the NLB Group. The EBRD-financed projects are expected to be designed and operated in compliance with good international practices relating to sustainable development. The EBRD has defined ten performance requirements covering the key areas of environmental and social issues and impacts. The 10 EBRD Performance Requirements (PRs) are:

- PR 1: Assessment and Management of Environmental and Social Impacts and Issues
- PR 2: Labour and Working Conditions
- PR 3: Resource Efficiency and Pollution Prevention and Control

³ <https://eur-lex.europa.eu/eli/reg/2020/852/oj#document1>.

⁴ <https://eur-lex.europa.eu/eli/reg/2019/2088/oj>.

- PR 4: Health and Safety
- PR 5: Land Acquisition, Involuntary Resettlement and Economic Displacement
- PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PR 7: Indigenous Peoples
- PR 8: Cultural Heritage
- PR 9: Financial Intermediaries
- PR 10: Information Disclosure and Stakeholder Engagement

In the following years, the NLB Group is expected to meet the relevant requirements from the above list. In doing this it enjoys the support of the EBRD in several ways, especially with extensive knowledge and experience in designing policies and processes for successful management of climate and environmental risks. The EBRD's requirements and recommendations are clear, in-depth, detailed, and comprehensive.

What is more, the EBRD and other important international financial institutions encourage the NLB Group to set up the so-called Environmental and Social Management System (ESMS). The ESMS represents one of the most important and comprehensive steps in integrating sustainability into banking operations.

4. Development and implementation of an Environmental and Social Management System (ESMS)

We can find numerous environmental and social codes and standards, which define the rules and the objectives for companies to follow. But the real challenge is in the implementation. An ESMS helps companies to integrate the rules and objectives into core business operations, through a set of clearly defined, repeatable processes. It helps businesses to become more effective in reducing its impact on the environment, its communities, its employees, and other external stakeholders. It does not need to be big; however, it should be scaled to the type and size of a company. According to the World Bank Group, there are obvious direct and tangible business benefits stemming from the implementation of an ESMS:

- an effective assessment and management of a company's environmental and social challenges in the market, where it operates and makes business,
- conserving and using energy more efficiently, reducing material inputs, minimize waste, reducing costs of waste disposal due to recycling, which all improves competitiveness and profitability of a company,
- the suppliers with better social compliance most often score higher in key performance indicators such as on-time delivery and quality,

- transparent human resource policies and procedures improve communication between workers and managers, which helps to anticipate and avoid labour-related problems,
- effective occupational health and safety management procedures help to identify workplace and process hazards, ...

A carefully developed, detailed ESMS is only valuable if it is well-implemented. One could think a management system is a bunch of documents. However, that is only a part of it. The most important part is an implementation of a system and above all its continual improvement.

4.1. ESMS as part of a comprehensive management system within the bank

Banks are driven to improve their environmental and social (E&S) risk management capacity to reduce credit and liability risks arising from environmental and social issues. A number of banks have publicly committed themselves to sustainable banking (reference to United Nations Principles for Responsible Banking⁵), and many have voluntarily adopted the principles established under various sustainability initiatives.

A bank can manage its exposure to E&S risks by developing an ESMS. This helps a bank to decrease its exposure to overall risk. In case of a bank an ESMS consists of components, such as bank's E&S policy, procedures, management commitment and designated staff with clear responsibilities for implementation. A bank should follow a firm and up to date guidance to review and manage the E&S issues and risks associated with its investments.

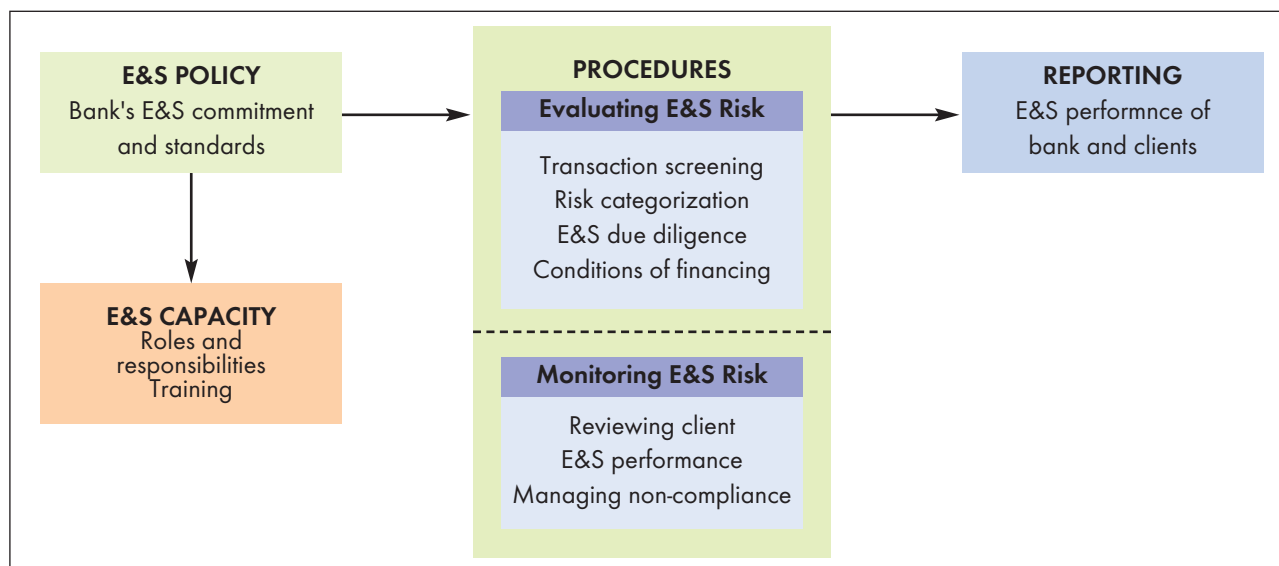
A) E&S Policy:

An E&S policy states a bank's vision and mission with respect to the environment, society, and contributions to sustainable development.

B) E&S Capacity

For an ESMS to function properly, it is essential that roles and responsibilities for carrying out the necessary procedures and making decisions are clearly defined. A following staff of a bank are involved with implementing different aspects of the ESMS, although each bank should assign responsibilities in the manner that makes most sense according to its own structure: senior management, ESMS Officer, ESMS Coordinator, Loan Officers and Relationship Managers, Credit and/or Investment Analysts, Credit and/or Investment Committee, Legal Department.

⁵ <https://www.unepfi.org/banking/bankingprinciples/>.



Source: <https://firstforsustainability.org>.

C) Procedures

The following bank's procedures are introduced by the implementation of an ESMS:

- I. Screening transactions,
- II. Categorising transactions based on their environmental and social risk,
- III. Conducting environmental and social due diligence,
- IV. Decision-making process,
- V. Monitoring a client's environmental and social performance, and
- VI. Managing a client's non-compliance with the bank's environmental and social standards.

D) Monitoring Client E&S Performance

The purpose of monitoring a client's environmental and social performance is to assess existing and emerging environmental and social risks associated with a client's operations during the duration of a transaction.

E) Managing Non-Compliance

In cases of a client's non-compliance with the bank's environmental and social standards that are stipulated in a contractual relationship, the client will have a timeframe for resolving the issue.

F) Internal and External Reporting

A bank's ESMS should include periodic reporting on the environmental and social performance of transactions and measures taken to reduce its overall exposure to environmental and social risk.

5. NLB Group and the sustainability governance

Introducing sustainability into banking certainly requires new knowledge and additional processes. The introduction of innovations and changes, in principle, always brings some resistance to established patterns of operation, as

well as purely justified concerns. Thus, for example, the expected introduction of the ESMS represents an important change for NLB Group in the established loans approval process.

From HR point of view, the introduction of sustainability will require new banking profiles, such as: ESG or Sustainability Coordinator and the ESMS Officer. New structures and decision-making bodies, such as Sustainability Committee, will be needed as well. There is also an increasing need for the internationally standardized role of the so-called Chief Sustainability Officer.

6. Conclusion

The NLB Group customers are curious and demand the best – both in providing services tailored to their needs and in managing our business. This further encourages us to introduce sustainable principles into our business. Demand for sustainable financial products in Slovenia may still be modest, but we expect it to increase. The green transition - as the name suggests - is just happening. Consequences for banks will be different, depending on the flexibility of management teams. The question of ethics and morality also arises. If we really want to work constructively, responsibly and effectively in creating a better environment and society where we live and work, then we must not be afraid to introduce sustainability. Even if this means that we in some cases may be more limited in our search for business opportunities. On the other hand, our environmentally and socially aware activities attract new projects where we deal with companies and teams of visionaries who demand an environmentally and climate-advanced bank.