

Experiences from the MNB's Green Preferential Capital Requirement Programme and the Extension of the Programme*

Donát Kim  – Eszter Raciborski  – Bálint Várgedő 

The study examines the Green Preferential Capital Requirement Programmes of the Magyar Nemzeti Bank, with a special focus on their extension, and presents the information on which the decision is based, the theoretical background of the programmes, the international regulatory environment, the mechanism of the preferential capital requirement and the results of the programmes. The results and feedback from market participants suggest that the preferential capital requirement programmes have a market and institutional development impact across the financial institutions system. From a prudential perspective, the green preferential capital requirement programmes did not have a material negative impact: they reduced banks' capital requirements by up to 0.31 per cent only. In view of the positive results, having been extended for a uniform period, these programmes are expected to continue to encourage green lending.

1. Motivations and main features of the programme

Climate and environmental risks are challenging for credit institutions in several regards, for example, because of their time horizon and the increasing magnitude of the risks concerned. In such an environment, the timing of regulatory and supervisory action is also a key factor in nudging the economy onto a path of orderly transition. Based on these considerations, the Magyar Nemzeti Bank (central bank of Hungary, MNB) introduced its preferential capital requirement programme in 2020. Within the framework of these programmes, the MNB reduces the Pillar 2 capital requirements of participating institutions.

Green preferential capital requirement programmes are relevant instruments in the MNB's green toolkit, both for managing environmental risks and for mobilising green resources. In terms of risk considerations, the MNB's objective when introducing the programmes was to shift, to the extent possible, banks' portfolios towards

* The papers in this issue contain the views of the authors which are not necessarily the same as the official views of the Magyar Nemzeti Bank.

Donát Kim: Magyar Nemzeti Bank, Head of Department; Corvinus University of Budapest, PhD Student. Email: kimdo@mnbb.hu

Eszter Raciborski: Magyar Nemzeti Bank, Supervisory Advisor. Email: raciborskie@mnbb.hu

Bálint Várgedő: Magyar Nemzeti Bank, Analyst; Corvinus University of Budapest, PhD Student.

Email: vargedob@mnbb.hu

green activities, customers and industries, thus reducing institutional and systemic transition risks. In addition, the database accumulated during the programme – which is unprecedented even by international standards – can also contribute to the future management of environmental risks. While the programme is a positive incentive for the banking system in itself, through its *Green Recommendation (MNB 2023)* the MNB has also required banks to adopt increasingly prudent environmental risk management practices in recent years.

The programmes provide incentives for banks to offer increased financing to green participants in the real economy, thus indirectly promoting the green transition. These incentives can potentially give green market participants access to more advantageous financing opportunities, for example, through lower cost of capital or larger credit amounts. Another important objective of the programmes related to financing the green transition was the creation of a green credit market in Hungary. The green definitions that followed the EU taxonomy became a guideline for market participants, and several subsequent central bank measures were based on the framework. The launch of GCC¹ and GCR² was also intended to raise awareness of the importance of environmental sustainability in finance. Subsequently, these measures have led to the accumulation of organic green financial insight across the sector as a whole. In addition, among the MNB's green instruments they represent tools that can be used continuously across economic and credit cycles by nature.

In this paper, we also cover the theoretical basis of the programme, the scope and operation of the preferential capital requirement and the regulatory environment. Finally, the impact mechanism of the programme is illustrated with calculation examples, and the main indicators and results of the programme are also reviewed.

2. Theoretical overview of the programme

The two groups of differentiated capital requirement frameworks that respond to climate change and environmental risks are the regulatory tools referred to as the green supporting factor (GSF) and the dirty penalising factor (DPF). GCC and GCR programmes are classified into the former, supporting group. *Kim and Várgedő (2024)* provide an overview of green microprudential measures, which is briefly summarised below.

According to *Dafermos and Nikolaidi (2021)*, the introduction of the GSF and DPF reduces global warming and hence physical risks by increasing the appeal of green instruments for the purposes of lending. However, the introduction of the DPF reduces the volume of lending due to higher capital requirements for banks, which

¹ Green preferential capital requirement for corporates and municipalities

² Green preferential capital requirement for retail customers

has a negative impact on economic output and, *ceteris paribus*, increases loan default rates. The downside of the GSF is that it increases banks' leverage, which might jeopardise financial stability. From the perspective of the climate, however, it can be concluded that the combined use of the GSF and DPF contributes to reducing emissions. The study of the authors demonstrates that their effects on the real economy and financial stability offset one another. The impact of these instruments is minor in itself, but it may strengthen when combined with green fiscal policy.

According to *Lamperti et al. (2021)*, the GSF increases the credit portfolio, but it nudges lending towards riskier loans and thus increases credit losses. The authors found that the introduction of the GSF did not significantly reduce emissions due to its stimulating effect on the real economy. Optimal regulation can be achieved through a combination of green financing instruments, such as guarantees and carbon-related risk instruments. In addition to the GSF, *Dunz et al. (2021)* also stress the need for additional instruments, such as a carbon tax.

Oehmke and Opp (2022) argue that although the GSF and the DPF ensure optimal regulation, without a broader toolkit they are insufficient to meet the green mandate. The authors warn against the introduction of an exclusive DPF as it may crowd out lending to green firms. In addition to risk factors, the impact of capital requirements on financing is a key issue for policymakers.

Admati and Hellwig (2014) pointed out that the capital structure of banks did not necessarily affect lending activity, as they issue capital by adjusting leverage. In the short term, it may be difficult to raise external capital, but in the long run banks may achieve higher capital levels. Empirical studies, however, question this argument. In Belgium, *De Jonghe et al. (2020)* found that even though higher capital requirements entailed a lower credit supply, their impact on aggregate bank lending was rather moderate. Similar observations were made in the Swiss mortgage market (*Basten 2020*). Based on the findings of *Benetton et al. (2021)*, mortgage interest rates declined in the UK following a reduction of capital requirements.

The SME supporting factor introduced in the EU generated mixed results for the analysis of the GSF. The European Banking Authority (*EBA 2016*) did not find an increase in SME financing, while *Dietsch et al. (2019)* identified a positive effect. Few empirical results are available on the introduction of the GSF and the DPF. In Brazil, environmental risks have been integrated into the annual internal capital adequacy assessment process and review (ICAAP) for large banks since 2017. Examining the impact of regulation, *Miguel et al. (2022)* found that large banks had shifted their loans away from sectors with high environmental risk. The impact of the new regulation on the real economy and on greenhouse gas emissions was moderate.

3. Preferential capital requirement in Hungary

The MNB is in a unique position in Europe, as its green ambitions are also supported by the sustainability mandate adopted by the Parliament on 28 May 2021. The mandate was published in the Hungarian Official Gazette on 2 June 2021 and entered into force on 2 August 2021. Since then, the MNB has launched a number of green initiatives in a wide range of central bank oversight areas, such as monetary policy (*Kolozsi et al. 2022a*), foreign exchange reserve management (*Kolozsi et al. 2022b*) and financial stability (*Ritter 2022; Várgedő 2022*). One of the first steps was the introduction of green preferential capital requirement programmes from early 2020. The programmes were open to the green loan exposures of banks for contracts signed after 1 January 2020. By international standards, this instrument puts the MNB at the forefront of green finance, as among the central banks/supervisory authorities of the EU the MNB is the first European authority to facilitate the green transition through bank capital regulation as well.

The preferential capital requirement applied by the MNB essentially means that the authority reduces the credit institution's Pillar 2 capital requirement for a given year under the ICAAP. The reduction amount is 5 or 7 per cent of the gross value of green exposures. The reduction may result in a negative Pillar 2 add-on for individual green transactions, but at the level of retail and corporate portfolios, the capital cannot be reduced below the Pillar 1 capital requirement. The maximum rate of the discount is 1.5 per cent of the credit institution's total risk exposure amount (TREA). In addition, if a transaction becomes non-performing, it is removed from the programme. The preferential capital requirement is available to credit institutions and their subsidiaries established in Hungary, and to the subsidiaries of financial enterprises providing financial lease services. In the case of foreign subsidiaries, the Hungarian parent bank can claim the discount on a consolidated basis. Taking recourse to the programmes is voluntary and subject to data disclosure.

GCC, which originally covered investment or project loans, bond exposures and green bond exposures financing renewable energy production, was expanded from 31 August 2021 to cover financing under electromobility, sustainable eco-farming and food processing (including bee pasture plantation and habitat development), energy efficiency investment, acquisition of green business equity and green finance frameworks, and from December 2021 to cover sustainable real estate investment. At the same time, as the term of the programme was extended, the range of activities covered was expanded further in autumn 2023. Green bonds issued under the Green Bond Principles or Climate Bonds Standards are also eligible. Similarly, the GCR was amended in August 2021 and June 2022. Loan purposes that fully comply with the EU taxonomy criteria receive a discount of 7 per cent, while those that cannot provide full, documented evidence of taxonomy compliance (together with a significant contribution to the environmental target, avoiding significant damage

and meeting minimum social standards) but fulfil the other criteria set out in the programme receive a 5-per cent discount.

4. International regulatory environment and the leeway of domestic supervision

One may wonder why the MNB applied the GSF procedure to the Pillar 2 capital requirement. Examining the different aspects of the capital regulation clearly reveals that certain regulatory instruments fall under regulatory competence above the national competence. One example is the issue of modification in the case of risk weights. In their definition, some initiatives around 2020 (*Finance Watch 2020*) advocated the use of “one-for-one risk weighting”, which proposed a 1,250-per cent risk weighting for exposures related to new fossil fuel projects. As a result, financial institutions would have to finance these transactions 100 per cent from their own capital (=1,250 per cent * 8 per cent), which would eliminate the contagion effect spreading to foreign sources. *Finance Watch (2022)* recommended less ambitious risk weights of 150 per cent.

Given the limited national competence, it is important to review the approach of supranational organisations. To sum up briefly, the international financial supervisory authorities and working groups currently take a subdued position on these types of regulations, issuing neither a clear recommendation nor a clear prohibition. Further analysis will be undertaken in the coming years to demonstrate the direction and strength of the links between sustainability and riskiness. The EBA recommends, in general, that for all similar schemes the regulator’s exit option should be maintained through the use of a “sunset clause”³ or a built-in phase-out mechanism.

In the area of prudential regulation, the EBA has taken the initiative to examine whether it would be appropriate to modify the current prudential treatment of exposures to take account of environmental and social considerations (under Pillar 1). At present, *EBA (2023)* does not recommend the use of either supporting or penalising factors under Pillar 1 until data pertaining to a sufficient quantity and quality of defaults or the probability of default justify it. However, the text includes a clause stating that it is not only the Pillar 1 capital regulation that is suitable to address environmental and social risks. In addition, it lists a number of options in the current Pillar 1 framework where the impact of environmental risks could be incorporated even in the short and medium term. For example, support for the inclusion of environmental and social factors in credit risk ratings in the models of external credit rating agencies, which banks can use to complement their internal risk analysis.

³ A provision in a regulation to the effect that the regulation automatically expires on a particular date, provided that the date in the clause has not been changed or another regulation with the same content has not been adopted before that particular date.

In contrast to the green supporting factor, the introduction of the dirty penalising factor was not made possible by existing data disclosures and information collection. It is important to underline that the preferential capital requirement is available to institutions subject to reporting requirements, where the credit institution is responsible for verifying the green loan purpose and providing the necessary documentation. The introduction of a DPF, while theoretically possible, would require significantly more complex and longer timeframes to implement in practice. The MNB is exploring the possibility of similar measures to ensure the resilience of the banking system.

As can be seen from the literature review, one common criticism of GSF programmes is that there is insufficient historical basis for such a differentiation of risks. In the prudential framework, a predominantly statistical approach to risk is used, while GSF schemes take into account additional aspects when determining capital requirements. The standard approach to risk assessment is based on the predominance of historical information (e.g. financial performance) and only to a lesser extent on forward-looking estimates (e.g. assessment of refinancing risk). However, transition risks, such as regulatory and technological risks, are inherently difficult to quantify on the basis of historical information and can be assessed using forward-looking methods.

Another important aspect is that, due to the nature of the transition risks, these effects manifest over the longer term. In addition, the mobilisation of green resources is time-bound. The first major milestone in the green transition will be 2030. Most of the European Union's interim green economy development targets for achieving climate neutrality by 2050 are linked to 2030. However, the transition is a process and is expected to take place both before and after the target dates. GCC and GCR are intended to provide incentives for the bank financing of these activities by reducing the costs of capital. As the green transition process will require significant financing over the next six years to meet the 2030 climate targets, the programme will support lending activities that serve green objectives to be implemented in the medium to long term.

5. The impact of capital requirement calculation through an example

The following example illustrates the calculation of the green supporting factor (*Table 1*). Assume that for a project exposure compliance with the capital requirements programme can be ensured at 50 per cent; this is called the *green ratio*. Assume also that it meets the taxonomy criteria and therefore qualifies for a 7-per cent discount at 50 per cent. In the fictitious example, the gross exposure value is HUF 100 and the risk weight assigned to the exposure type is 80 per cent.

Table 1		
Calculation example of the preferential capital requirement at transaction level		
Gross exposure	HUF 100	
Green ratio	50%	
Rate of discount	7%	
Risk weight	80%	
<i>P2 add-on (above 8%) without discount</i>	5%	
Risk-weighted exposure (RWA)	HUF 80	= HUF 100 * 0.8
Capital requirement for P1	HUF 6.4	= HUF 80 * 0.08
<i>P2 capital requirement without discount</i>	HUF 4	= HUF 80 * 0.05
<i>Capital requirement discount (upper limit)</i>	HUF 3.5	= HUF 100 * 0.5 * 0.07
<i>P2 capital requirement with discount</i>	HUF 0.5	= HUF 4 – HUF 3.5
<i>P1 + P2 capital requirement without discount</i>	HUF 10.4	= HUF 6.4 + HUF 4
<i>P1 + P2 capital requirement with discount</i>	HUF 6.9	= HUF 6.4 + HUF 0.5

For this transaction, the Pillar 1 capital requirement is 8 per cent of the risk-weighted exposure (RWA); therefore, an additional capital allocation of HUF 6.4 is required under Pillar 1. For the sake of simplicity, let us assume that the supervisory authority has set a 13-per cent SREP capital requirement for the transaction type, of which 8 per cent is the capital requirement under Pillar 1 and 5 per cent is the add-on under Pillar 2. Therefore, additional capital of HUF 4 ($100 * \text{HUF } 0.8 * 0.05$) is required under Pillar 2 after the transaction. This can be reduced by the preferential capital requirement, which is the gross exposure (HUF 100) multiplied by the green ratio (50 per cent) and the discount rate (7 per cent). Accordingly, the discount will be up to HUF 3.5, as the portfolio level limits may still reduce this value. Thus, the transaction will have a Pillar 1 and Pillar 2 capital requirement of HUF 6.9, instead of the HUF 10.4 calculated without the discount, and the total capital requirement (lower limit) on the RWA will be 8.625 per cent instead of 13 per cent.

The calculation of portfolio-level discounts can also be illustrated with an example. Suppose a bank has a corporate and retail portfolio of HUF 100,000 and HUF 150,000, respectively, with green holdings of 6 and 10 per cent, and the corresponding risk weights are 80 and 50 per cent for the two segments (Table 2). Furthermore, the discount rate is 5 per cent for corporate and 7 per cent for retail green loans, and suppose that the supervisory Pillar 2 additional capital requirements are HUF 3,200 and HUF 750, respectively. It can then be seen that the amount of Pillar 1 and Pillar 2 capital requirements are reduced from 12 to 11.63 per cent for the retail part and from 9 to 8 per cent for the corporate part (in proportion to RWA). For the retail portfolio, the preferential capital requirement is constrained by the fact that the total capital requirement cannot fall below the Pillar 1 requirement. Therefore, the applicable rule becomes an active limitation.

The Pillar 1 and Pillar 2 requirements for the entire loan portfolio amount to 10.55 per cent of the RWA without the discount and 9.87 per cent with the discount. Since the difference between the two is less than 1.5 per cent, the upper limit is not activated; thus the 9.87 per cent is the final figure.

Table 2			
Calculation example of the preferential capital requirement at the portfolio level			
	Corporate loan portfolio		
Corporate	Gross corporate loan exposure	HUF 100,000	
	of which gross green exposure (6%)	HUF 6,000	= 100,000 * 0.06
	Risk-weighted assets (80%)	HUF 80,000	= 100,000 * 0.8
	Discount (5%)	HUF 300	= 6,000 * 0.05
	Capital requirement for P1	HUF 6,400	= 80,000 * 0.08
	P2 add-on without discount	HUF 3,200	
	P1 + P2 capital requirement without discount	HUF 9,600	= 6,400 + 3,200
	P1+ P2 capital requirement rate without discount	12%	= 9,600 / 80,000
	P1 + P2 capital requirement with discount	HUF 9,300	= 6,400 + max(0; 3,200 – 300)
	P1 + P2 capital requirement rate with discount	11.63%	= 9,300 / 80,000
	Retail loan portfolio		
Retail	Gross retail loan exposure	HUF 150,000	
	of which gross green exposure (10%)	HUF 15,000	= 150,000 * 0.1
	Risk-weighted assets (50%)	HUF 75,000	= 150,000 * 0.5
	Discount (7%)	HUF 1,050	= 15,000 * 0.07
	Capital requirement for P1	HUF 6,000	= 75,000 * 0.08
	P2 add-on without discount	HUF 750	
	P1 + P2 capital requirement without discount	HUF 6,750	= 6,000 + 750
	P1+ P2 capital requirement rate without discount	9%	= 6,750 / 75,000
	P1 + P2 capital requirement with discount	HUF 6,000	= 6,000 + max(0; 750 – 1,050)
	P1 + P2 capital requirement rate with discount	8%	= 6,000 / 75,000
	Total portfolio		
Total	P1 + P2 capital requirement without discount	HUF 16,350	= 9,600 + 6,750
	P1+ P2 capital requirement rate without discount	10.55%	= 16,350 / (80,000 + 75,000)
	P1 + P2 capital requirement with discount	HUF 15,300	= 9,300 + 6,000
	P1 + P2 capital requirement rate with discount	9.87%	= 15,300 / (80,000 + 75,000)
	Capital requirement discount rate	0.68%	= min(10.55% – 9.87%; 1.5%)

The calculation example is simplified in several respects: it partly ignores a number of rules, such as capital buffers and capital guidance. We also assumed that a uniform discount rate and homogeneous risk weight values were used. The total calculation shows that the institution's TSCR (total SREP capital requirement, i.e.

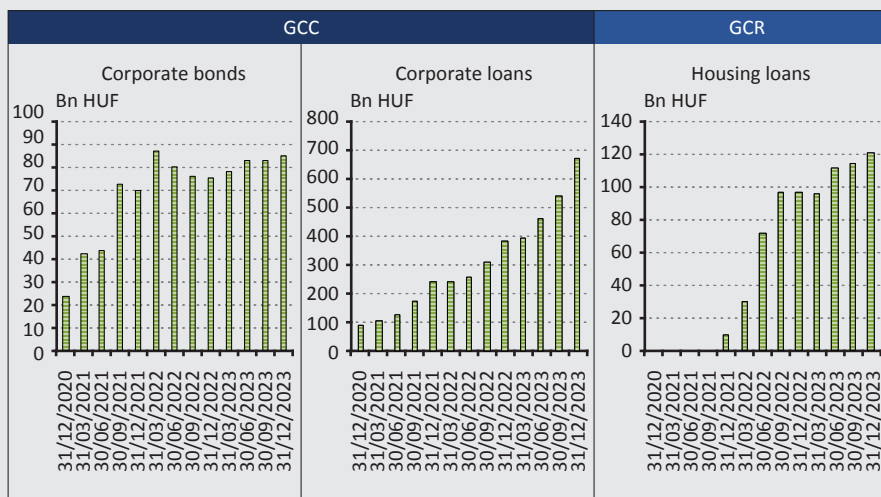
the sum of Pillar 1 and Pillar 2 capital requirements) for the following year will decrease by 0.68 per cent.

Experience from recent years shows that, from a prudential perspective, the green preferential capital requirement programmes have not had a material negative impact on banks' capital adequacy. At the end of 2023, the TSCR-reducing effect of capital requirement discounts ranged between 0.07 and 0.31 percentage points for the institutions participating in the programme. In other words, the discount had a much smaller impact than shown in the fictitious example. It should also be noted that the capital adequacy of Hungarian financial enterprises is stable and is not affected negatively by GCC/GCR to a material degree.

6. Results of the programmes

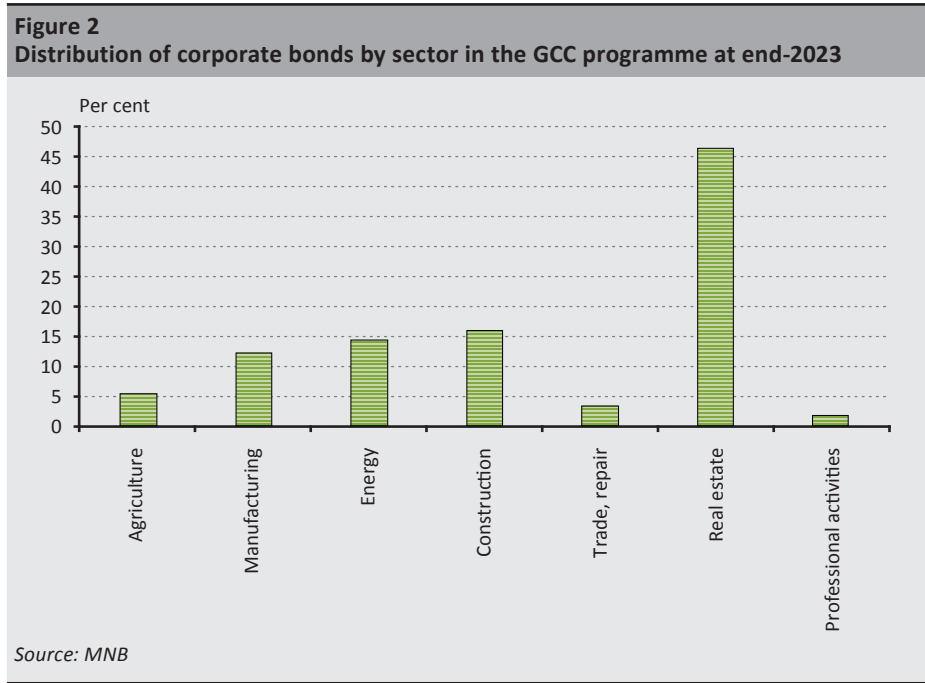
The preferential capital requirement programmes have expanded significantly since their initial announcement. As at 31 December 2023, capital requirement discounts were claimed for bank exposures amounting to HUF 880 billion in total. Of this amount, HUF 85 billion represented bond exposures, HUF 673 billion were corporate loan exposures and HUF 122 billion housing loan exposures (*Figure 1*).

Figure 1
Historical evolution of end-quarter GCC and GCR portfolios



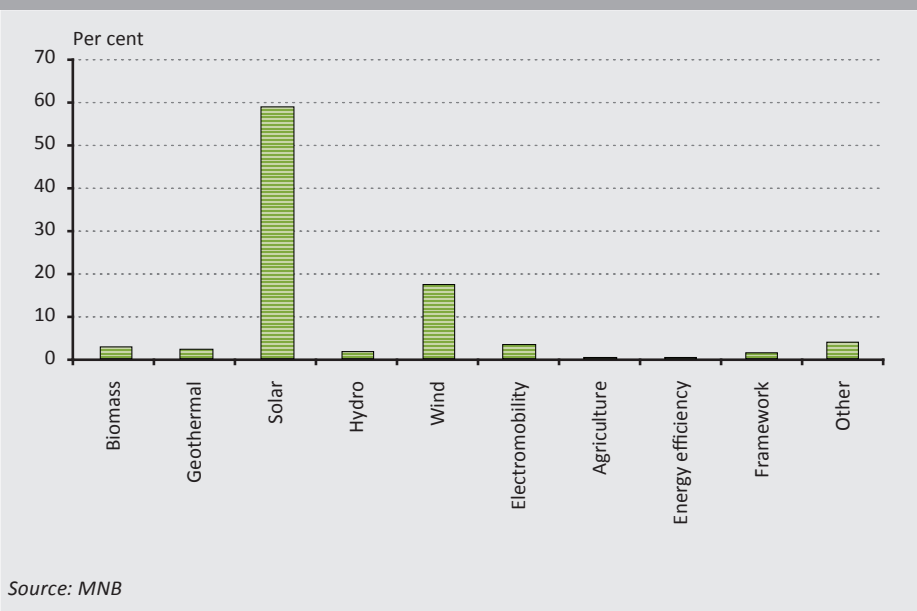
Source: MNB

In the case of bonds, banks mainly claim discounts regarding the transactions of borrowers with real estate investments that meet energy efficiency criteria (construction and real estate companies), and to a lesser extent the transactions of borrowers engaged in manufacturing or energy supply activities (*Figure 2*).



At present, corporate loans eligible for the green discount are heavily dominated by loans for the installation of solar farms (59 per cent), which by all international standards are considered a significant contribution to climate change mitigation, similar to wind and geothermal energy, which are also present, albeit to a lesser extent (*Figure 3*). Transactions for the financing of the acquisition and operation of electric vehicles and financing under the Green Framework have also started to appear. To date, the discount has not been applied to municipal loans.

Figure 3
Distribution of loan purposes for corporate loans in the GCC programme at end-2023



In the case of GCR, as well, a concentration in newly-built real estate can be observed. A significant proportion of these loans are loans disbursed under the Green Home Programme (ZOP). It should be noted, however, that as the programmes were extended and amended in a staggered manner while maintaining the original deadline in several cases, the possibility of diversification was limited at the outset by the original, tight deadline of the programmes (31 December 2024).

As regards the maturity structure, it can be observed that credit institutions typically apply the green discount for long-term transactions in the case of all three instruments. Bonds have a maturity of 5–10 years, most corporate loans have a maturity of over 10 years with only a smaller proportion maturing in 5–10 years, while housing loans are disbursed, almost exclusively, at a maturity of over 10 years.

In addition to the quantified results, it should be noted that programmes have had a market- and institution-building impact on the financial institution system as a whole. Evidence indicates that the programmes provided a basis for the design of the green finance frameworks of Hungarian financial enterprises and for their product developments aimed at green finance. Several domestic banks have green finance frameworks in place already, and the programme has also induced dedicated product development at numerous institutions, for example, in the case of products designed to finance green home renovation and electromobility. In April 2023, the

terms and conditions of Certified Consumer-friendly Housing Loans (CCHL) were also amended, with the introduction of the Green CCHL scheme, under which creditors may waive the disbursement fee, waive the fee for a certified energy certificate and may offer additional green interest rate discounts.

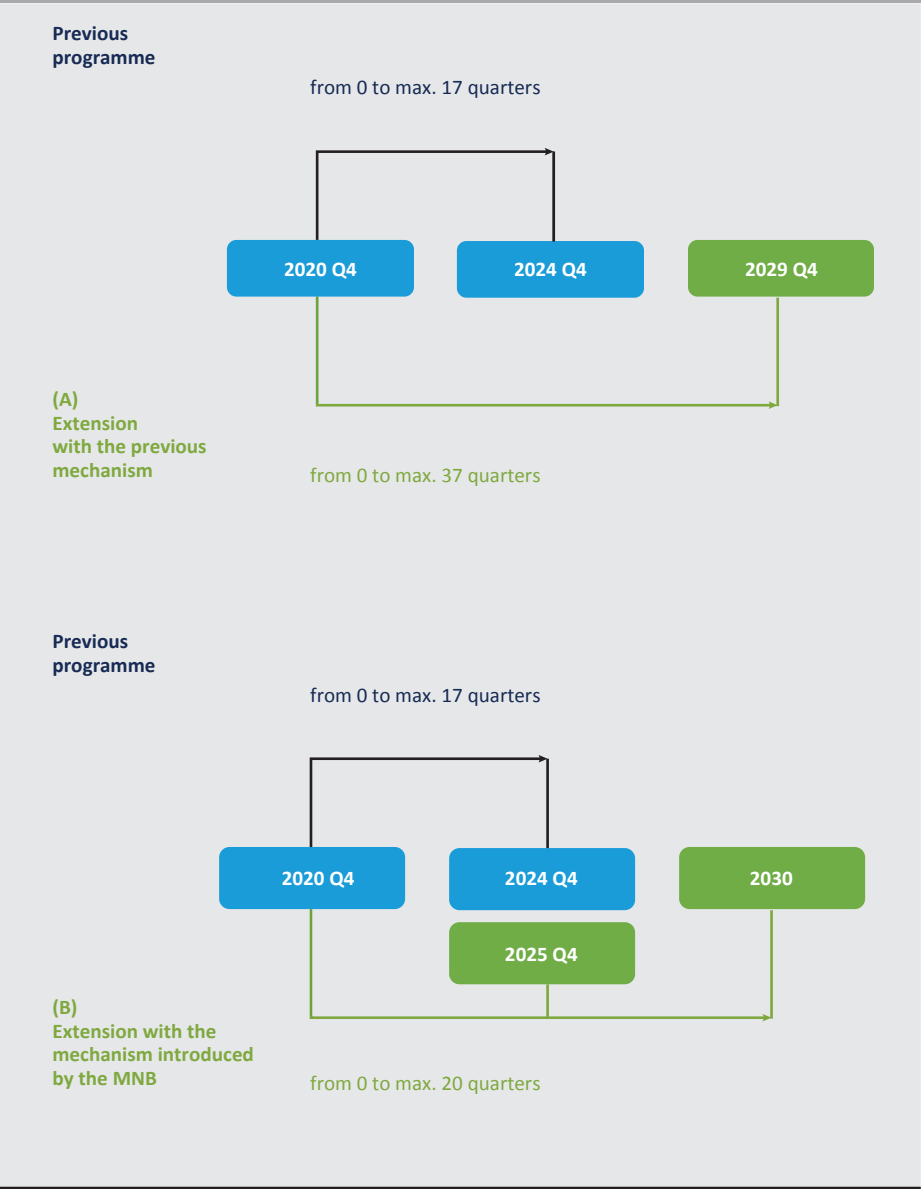
7. Method and effect of the extension of the term

In order to understand the practical application of capital incentives, the MNB conducted in-depth interviews with several market institutions on the institutional processes involved in green finance and the transactions financed. All of the banks agreed that the preferential capital requirement programmes had a strong market development effect and that an extension of the programmes would support the growth of the green credit market in Hungary. Several banks indicated that they were in the process of developing new green credit products at their institution, building on the preferential capital requirement programmes. The definitions of green loan purposes provide a bridge between EU taxonomy and Hungarian lending practice that is ambitious and forward-looking, but at the same time achievable and can be incorporated into the lending practice. The MNB's criteria system has become a best practice standard in the market, generally recognised and accepted by foreign parent banks as well.

Feedback from market participants suggests that the programmes also contribute to the adaptation of green guidelines and standards to the domestic market, as they act as a guideline for financial institutions and participants of the real economy, taking into account the structural characteristics of the Hungarian economy (e.g. loan purposes aligned with the Hungarian energy strategy, ecological agricultural strategy, construction quality requirements). The programmes also required the development of green finance competences and practices that contribute to financial institutions' compliance with the Green Recommendation. The capital requirement discount also plays a role in compensating for the administrative burdens and costs (e.g. additional risk assessment, loan purpose verification) associated with the prudent operation of green finance. It also supports other central bank initiatives (e.g. the expansion of certified consumer-friendly housing loans).

The MNB considered two mechanisms as an option for extending the deadline: firstly, to maintain the previous mechanism and modify the deadline for the programmes until 31 December 2029 (*Option A*). Secondly, to apply a modified mechanism whereby the programmes expire on 31 December 2025, with the proviso that all transactions concluded by 31 December 2025 benefit from the capital requirement discount (including existing transactions) for the first five calendar years of the term (*Option B*). *Figure 4* shows a comparison of the (maximum) benefit periods under the two extension options.

Figure 4
Schematic presentation of the maximum time horizons for benefiting from the preferential capital requirement under the previous mechanism and under the extension alternatives



Under *Option A*, all transactions previously included in the programmes would benefit from the preferential capital requirement until the end of the lifetime of the programmes, i.e. until the 2030 ICAAP review at the latest. However, for new transactions concluded from 2026, the period during which the ICAAP discount could be claimed would fall below the 5-year period that is considered effective, i.e. the stimulating effect of the programmes would become degressive. Thus, from an incentive point of view, this extension mechanism runs the risk of over-rewarding the current portfolio while not providing sufficient incentives for new transactions. By contrast, *Option B* removes the degenerativity of the stimulating effect over the entire time horizon, because the preferential capital requirement can be applied for five years even for transactions concluded on the last day of the term (for 2030 at the latest during the 2031 ICAAP reviews).

The theoretical higher saturation risk (i.e. that the bank would exhaust 1.5 per cent of the TREA) also argued against *Option A*; however, since the current utilisation of the programmes varies between 4.72 per cent and 20.55 per cent per bank only (as at 31 December 2023), keeping the existing portfolio in the programme for such a long period would not pose a threat of crowding-out effects for the time being. In the event of a possible phase-out, it would be in favour of *Option B* that it is closer in spirit to the “sunset clause” proposed by the EBA. Environmentally and socially adjusted capital regulation is a developing field. As the database accumulates, we will obtain a more accurate view of the optimal regulation. It is therefore justified to maintain, for the time being, a “sunset clause”, with a view to considering an extension of the programme in the event of further positive experiences. Another argument in favour of *Option B* is that it enables banks to make simpler calculations from a pricing point of view. Predictability is an important factor in product development; consequently, it is preferable to have a generally uniform period from the disbursement of the loans for claiming the preferential capital requirement.

In summary, in order to maintain the stimulating impact effective over the full time horizon, to avoid over-rewarding the existing portfolio and to provide a stronger incentive for new transactions, the MNB extended the terms of the GCC and GCR programmes under *Option B*. The programme has also been expanded to cover three new loan purposes in the case of green corporate and municipal capital requirements: energy storage, greening of district heating systems and electric grid development.

8. Conclusion

Overall, all banks considered the MNB's green preferential capital requirement programmes to be successful and useful. The extension of the term of the programmes is important to maintain the initial momentum of green finance and to enable it to gain ground in more segments of corporate and retail lending. The green financial market and institutional development impact of the programmes is visible. In addition to the successful incentives, the discount schemes do not have a material adverse impact on the capital adequacy of banks, which is key to financial stability. The internationally unique database that will be accumulated thanks to the programmes will also provide the means for the assessment of the green hypothesis, i.e. sustainability and credit risk. Extended in the light of their results, the programmes may continue to encourage the further development of green financial markets and the growth of the share of green finance.

References

- Admati, A.R. – Hellwig, M. (2014): *The Bankers' New Clothes: What's Wrong with Banking and What to Do about It*. Princeton: Princeton University Press. <https://doi.org/10.1515/9781400851195>
- Basten, C. (2020): *Higher Bank Capital Requirements and Mortgage Pricing: Evidence from the Counter-Cyclical Capital Buffer*. *Review of Finance*, 24(2): 453–495. <https://doi.org/10.1093/rof/rfz009>
- Benetton, M. – Eckley, P. – Garbarino, N. – Kirwin, L. – Latsi, G. (2021): *Capital requirements and mortgage pricing: Evidence from Basel II*. *Journal of Financial Intermediation*, 48, 100883. <https://doi.org/10.1016/j.jfi.2020.100883>
- Dafermos, Y. – Nikolaidi, M. (2021): *How can green differentiated capital requirements affect climate risks? A dynamic macrofinancial analysis*. *Journal of Financial Stability*, 54, 100871. <https://doi.org/10.1016/j.jfs.2021.100871>
- De Jonghe, O. – Dewachter, H – Ongena, S. (2020): *Bank capital (requirements) and credit supply: Evidence from pillar 2 decisions*. *Journal of Corporate Finance*, 60, 101518. <https://doi.org/10.1016/j.jcorpfin.2019.101518>
- Dietsch, M. – Fraisse, H. – Lé, M. – Lecarpentier, S. (2019): *Lower bank capital requirements as a policy tool to support credit to SMEs: evidence from a policy experiment*. *EconomiX Working Papers 2019–12*, University of Paris Nanterre. <https://hal.science/hal-04141885>

- Dunz, N. – Naqvi, A. – Monasterolo, I. (2021): *Climate sentiments, transition risk, and financial stability in a stock-flow consistent model*. Journal of Financial Stability, 54, 100872. <https://doi.org/10.1016/j.jfs.2021.100872>
- EBA (2016): *Report on SMEs and SME supporting factor*. EBA/OP/2016/04, 23 March. <https://www.eba.europa.eu/sites/default/files/documents/10180/1359456/602d5c61-b501-4df9-8c89-71e32ab1bf84/EBA-Op-2016-04%20%20Report%20on%20SMEs%20and%20SME%20supporting%20factor.pdf>
- EBA (2023): *Report on the role of environmental and social risks in the prudential framework*. EBA/REP/2023/34, October. https://www.eba.europa.eu/sites/default/files/document_library/Publications/Reports/2023/1062711/Report%20on%20the%20role%20of%20environmental%20and%20social%20risks%20in%20the%20prudential%20framework.pdf
- Finance Watch (2020): *Breaking the climate-finance doom loop – How banking prudential regulation can tackle the link between climate change and financial instability*. A Finance Watch report, June. https://www.finance-watch.org/wp-content/uploads/2020/06/Breaking-the-climate-finance-doom-loop_Finance-Watch-report.pdf
- Finance Watch (2022): *Report – A safer transition for fossil banking: Quantifying capital needed to reflect transition risk*. Finance Watch, 3 October. <https://www.finance-watch.org/policy-portal/sustainable-finance/report-a-safer-transition-for-fossil-banking-quantifying-capital-needed-to-reflect-transition-risk/>
- Kim, D. – Várgedő, B. (2024): *A zöld tőkekövetelmények elmélete, hazai megvalósítása és tapasztalatai (The theory, domestic implementation and experiences of green capital requirements)*. In: Kocziszky, G.: *A Jövő Fenntarthatósága – A Fenntarthatóság Jövője (Sustainability of the Future – The Future of Sustainability)*. Metropolitan Egyetem, pp. 231–249.
- Kolozsi, P.P. – Horváth, B.I. – Csutiné Baranyai, J. – Tengely, V. (2022a): *Monetary Policy and Green Transition*. Financial and Economic Review, 21(4): 7–28. <https://doi.org/10.33893/FER.21.4.7>
- Kolozsi, P.P. – Ladányi, S. – Straubinger, A. (2022b): *Measuring the Climate Risk Exposure of Financial Assets – Methodological Challenges and Central Bank Practices*. Financial and Economic Review, 21(1): 113–140. <https://doi.org/10.33893/FER.21.1.113>
- Lamperti, F. – Bosetti, V. – Roventini, A. – Tavoni, M. – Treibich, T. (2021): *Three green financial policies to address climate risks*. Journal of Financial Stability, 54, 100875. <https://doi.org/10.1016/j.jfs.2021.100875>
- Miguel, F. – Pedraza, A. – Ruiz-Ortega, C. (2024): *Climate Change Regulations: Bank Lending and Real Effects*. Journal of Financial Stability, 70, 101212. <https://doi.org/10.1016/j.jfs.2023.101212>

MNB (2023): *Recommendation No 10/2022. (VIII.2.) of the Magyar Nemzeti Bank on climate-related and environmental risks and the integration of environmental sustainability considerations into the activities of credit institutions*. <https://www.mnb.hu/letoltes/green-recommendation-vol2-no-10-2022-viii2.pdf>

Oehmke, M. – Opp, M.M. (2022): *Green Capital Requirements*. Swedish House of Finance Research Paper No. 22–16. <https://doi.org/10.2139/ssrn.4040098>

Ritter, R. (2022): *Banking Sector Exposures to Climate Risks – Overview of Transition Risks in the Hungarian Corporate Loan Portfolio*. *Financial and Economic Review*, 21(1): 32–55. <https://doi.org/10.33893/FER.21.1.32>

Várgedő, B. (2022): *Climate Stress Test: The Impact of Carbon Price Shock on the Probability of Default in the Hungarian Banking System*. *Financial and Economic Review*, 21(4): 57–82. <https://doi.org/10.33893/FER.21.4.57>