



## BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"  
Hryhorii Skovoroda lane, 10,  
Sumy, 40022, Ukraine  
[www.businessperspectives.org](http://www.businessperspectives.org)

**Received on:** 28<sup>th</sup> of December, 2022  
**Accepted on:** 9<sup>th</sup> of February, 2023  
**Published on:** 9<sup>th</sup> of March, 2023

© Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tózsér, 2023

Anita Boros, Ph.D., Professor, Circular Economy Analysis Center, Hungarian University of Agriculture and Life Sciences (MATE), Hungary; MKB Bank, Hungary.

Csaba Lentner, Professor, Széll Kálmán Public Finance Lab, Faculty of Public Governance and International Studies, University of Public Service (UPS), Hungary. (Corresponding author)

Vitéz Nagy, Ph.D., Department of Infocommunication, Corvinus University of Budapest, Hungary, Széll Kálmán Public Finance Lab, UPS, Hungary.

Dávid Tózsér, Ph.D., Department of Ecology, Faculty of Science and Technology, University of Debrecen, Hungary; MKB Bank, Hungary.



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Conflict of interest statement:**  
Author(s) reported no conflict of interest

Anita Boros (Hungary), Csaba Lentner (Hungary), Vitéz Nagy (Hungary), Dávid Tózsér (Hungary)

# PERSPECTIVES BY GREEN FINANCIAL INSTRUMENTS – A CASE STUDY IN THE HUNGARIAN BANKING SECTOR DURING COVID-19

## Abstract

Recently, the management of the green financial sector has been widely influenced by global socio-economic concerns such as the COVID-19 pandemic and the energy crisis. The purpose of this paper is to evaluate, besides their environmental attitude, what opinions and experiences the affected stakeholders have about the sustainability-related processes in the Hungarian banking sector in the early 2020s. To assess this subject extensively, two questionnaire surveys were conducted in two consecutive years (2020/2021 and 2021/2022), involving 600 and 1,600 participants randomly chosen from banking databases, respectively. The results indicate that both residential and corporate participants have various but broadening knowledge of green financial instruments. Hungarian residential customers have pointed out the inconveniences of the most popular green loan product (Green Home Program), while there appears a distinct difference in green investment preferences between the two groups of respondents. Hungarian stakeholders are quite eco-conscious, and so are banks adopting sustainability and climate risk assessment actions, however, the implementations have much potential to exploit. Respondents also identify the energy crisis-related risks, while their trust in the banking system remains high even under volatile circumstances. These findings demonstrate that the Hungarian green banking sector has a high degree of crisis resistance with residential and corporate stakeholders behind giving trust and thereby the driving force toward the successful green transition.

## Keywords

sustainable finance, green bonds and funds, green mortgage debentures, COVID-19

## JEL Classification

F65, G15, G21

## INTRODUCTION

Green financial management in the banking system has been receiving increased interest on an international scale. Due to the appearance and distribution of sustainable financial instruments, stakeholders with environmental commitment and attitude have the opportunity to take advantage of green bank products and, by the guidelines and preferences of the European Union, the competitive edge their use and implementation offer (Cao et al., 2022). Further, the positive effects of green financial activities on general economic growth have also been proven, indicating its legitimacy even under recent circumstances burdened by the COVID-19 pandemic (Ngo et al., 2021).

Within this afore pattern of green transition, the Hungarian market for bank-related green financial instruments is in its initial state but has been intensively rising with huge potential, aiming to explore and reasonably adopt international innovations within a short time (Boros & Huszár, 2021). Recently, this market has been given new and, in some cases, contradictory impetus by the international regulatory

environment and various crises. Between 2015 and 2019, Hungary's economy expanded by an average of 4.1 percent per year, which was more dynamic than the Czech and Slovak growth and exceeded the average expansion of the euro area (Smit et al., 2020). However, due to the epidemic situation, a contraction broke in: the economy fell by more than 14.5 percent in the second quarter of 2020 (HSCO, 2020). The COVID-19 pandemic had many adverse individual and economic consequences: more than 2 million people contracted the disease and nearly 50,000 people lost their lives (WHO, 2022). (Magyar Nemzeti Bank – MNB, hereinafter: CBH, 2019), which – in its Green Financial Report (hereinafter: CBH Report; CBH, 2022a) – refers to the domestic biological deficit emerging in recent decades, which suggests that the ecological footprint exceeded the available biocapacity.

Besides being negatively concerned by crises (e.g., triggered by the COVID-19 pandemic and the energy crisis), collateral changes in the short- and mid-term preferences and the attitude of those actively involved are also justifiable in many cases. Therefore, regional and global economic conditions indicate the need for the continuous assessment of the affected bodies (e.g., residential and corporate stakeholders) acutely, which enables the depiction of the actual situation reports from various perspectives (Boiko et al., 2022; Sharabati et al., 2022).

## 1. LITERATURE REVIEW

Sustainable development-supporting actions on the international scale can be learned from several publications, in which recent crisis-based (green) economic losses were also focused. According to Moon and Hasan (2022), generally vulnerable states (e.g., Bangladesh) suffer the consequences of the pandemic situation the most, thereby hindering or even stopping the green market expansion. This phenomenon was also observed by other authors as a general trend, complemented by increased volatility in green financing and stock prices while making the recovery from this situation a long-term process with the possibility of the appearance of unforeseeable collateral consequences (Ferreira & Morais, 2022; Tan et al., 2022; Versal & Sholoiko, 2022). These unexpected crises resulted in lower consumption, which affected supply chains and demand (Donthu & Gustafsson, 2020; Kostenko et al., 2022). Additionally, the long-term adverse effects of the COVID-19 pandemic can be seen in the adaptation of 60% of the UN Sustainable Development Goals (SDG) (Naidoo & Brendan, 2020).

Available papers describing green market products with special respect to the Hungarian banking aspects are scarce, however, some precious works can be enlisted. The green instrument portfolio in the European market has been assessed by Boros and Huszár (2021), who emphasized an intensive running up of these bank products also in the Hungarian banking sector after 2019. This

headway can be explained by the guidelines of the European Union, while the Hungarian adaptation of these is also effective. Deák (2021) underlined, that the coordination of the domestic implementation framework is carried out by the CBH, which – besides its green initiatives – presents various publications regarding the sustainable transition of the banking sector. These publications of CBH have been disclosed since the late 2010s and cover a broad range of best practice actions needed for sector greening (CBH, 2022a; 2022b; 2022c; 2022d; 2022e; 2022f).

On the other hand, a huge number of publications deal with the reception of green instruments from customers, integrating several environmental aspects into survey-based research in many cases. In their paper, Ibe-enwo et al. (2019) indicated a strong relationship between green banking practices and bank loyalty, which makes green instruments a reliability tool.

Not only customers but bank staff have also been surveyed in this regard: Chen et al. (2022) stated that employees' effectiveness significantly promotes the success of green products. However, Satheesh Kumar (2017) underlined that in countries ahead of the major green transition (e.g., India), further education is needed to exploit bank staff contribution potential more.

In the case of corporate leader respondents, Cao et al. (2022) identified that an increase can be iden-

tified by their environmental commitment, which helps make their businesses greener, forming a higher demand for green banking instruments as sustainable development tools. Based on a survey involving more than 400 corporate members, Khan et al. (2021) pointed out that making use of green banking instruments not only supports the sustainable transition of the company but also enhances the formation of a positive corporate image, which then ends in an elevated demand for the company's services.

In general, Risal and Joshi (2018) named the banks and the government as the main responsibility takers in raising awareness and establishing motivation, which then leads to the prosperity of green banking. Moreover, considering the current economic processes, new approaches to economic policy and transformation of the economy were mentioned as reasonable (Velenturf & Purnell, 2021), for which – according to Widyawati (2019), and Shkarupa et al. (2021) – the capital allocation must be provided by the financial system, and increasingly more prominently by the spread of green financial instruments.

The purpose of this study is to evaluate the opinion and observations of residential and corporate respondents about green banking and the acts taken by the Hungarian banking system within the green transition process, assessed during two data collection intervals by questionnaire survey method.

According to this afore and previous literature information, the following hypotheses are formed:

- 1) Residential and corporate respondents have a growing knowledge of green banking products.
- 2) Residential and corporate respondents become progressively more eco-conscious and how is it reflected in their investment attitude.
- 3) Apparent measures are taken in the banking sector toward green transition.
- 4) Residential and corporate respondents are cautious about the estimated volume of energy crises.

## 2. METHODS AND DATA SOURCES

This study is based on two questionnaire surveys to assess the opinion and observations of stakeholders about green banking and the acts taken by the Hungarian banking system within the green transition process. The survey was conducted in two separate time intervals: between June 2020 and June 2021, 500 residential and 100 corporate customers were asked about their sustainability/environmental awareness attitude and green financial knowledge using self-established questionnaires (hereinafter: 2020/21 survey), while between June 2021 and June 2022, a total number of 1,500 residential and 100 corporate customers were surveyed using the same method (hereinafter: 2021/22 survey).

The representativeness of the questionnaire survey is supported by several factors. First of all, the lists of those interviewed in both the 2020/21 and 2021/22 surveys were randomly selected from bank databases, thus those conducting the questionnaire survey had no influence on the identity of the respondents. The questionnaires were also completed voluntarily, without any compensation. The questionnaires were recorded anonymously, so those who completed them could be sure that they were neither advantaged nor disadvantaged by the quality of their answers to the questions. Furthermore, the number of participants in the surveys can be considered a large sample, which further strengthens its representativeness.

Regarding the topics of the surveys, the questions were mainly focusing on the following:

- level of awareness of available green instruments;
- willingness to invest in green investment opportunities;
- their attitude on environmental consciousness;
- about the respondents' (entrepreneurs') willingness to switch to green solutions and the prerequisites of this transformation;
- about their opinion and changing their investment policies in light of the energy crisis.

When evaluating the collected information, the results of the two sampling periods were compared, while in case the CBH Report discussed an issue similar to the ones presented in our questionnaires, relevant results were evaluated and compared against the ones from the 2021/22 survey.

Data comparison and graphical presentation of results were performed in Microsoft Excel Version 2210 Build 16.0.15726.20188.

### 3. RESULTS

#### 3.1. Evaluation of green financial instruments

As for the reception of the Hungarian green capital market products, based on the surveys, residential customers knew green bonds the most, while corporate customers knew bonds and funds in a similar moderate way. The general information of respondents on green mortgage debentures is sporadic. It is visible, however, that in the one year be-

tween the two surveys, the general knowledge of the residential respondents expanded, while corporate awareness of green products followed an irregular pattern (Figure 1).

#### 3.2. The role of other popular green products

##### 3.2.1. Green loans

It was also investigated in this paper whether the most popular green loan product (Green Home Program, hereinafter: GHP) is suitable for the energy-efficient renovation of the Hungarian housing stock. In addition, the customer's opinion about the banking process, and general visible problems in connection with the GHP construction were also drawn. According to the customers involved, the most important problems mentioned affecting the scheme were the restricted credit limit, the complexity of the preparatory documents and procedures required for taking out a loan, as well as the initial information gaps of the commercial banks (Figure 2).

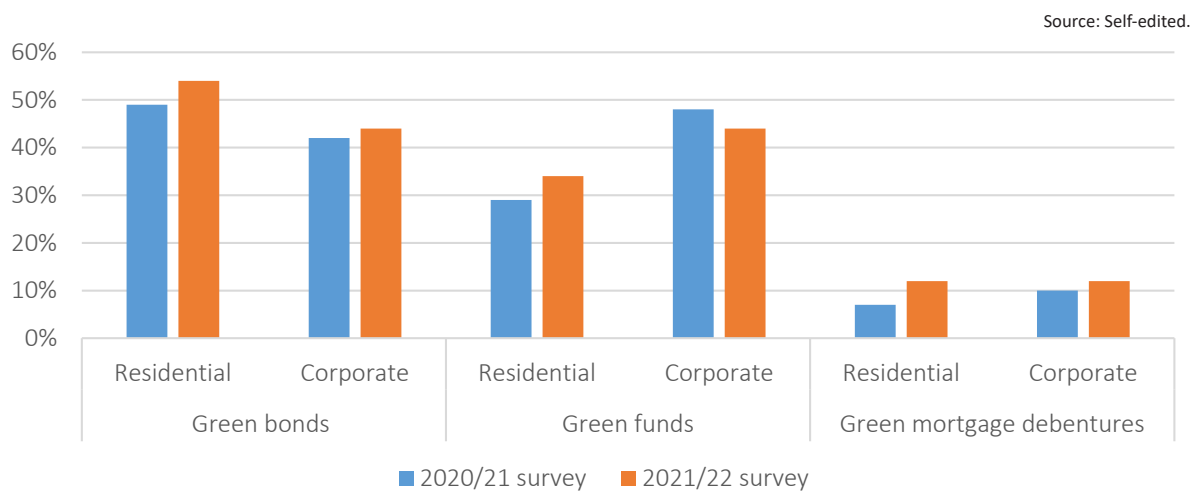


Figure 1. Residential and corporate knowledge of green financial products

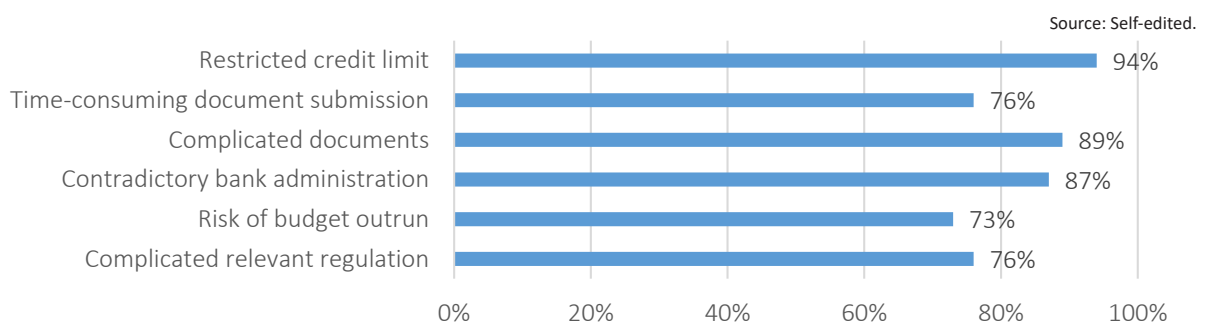
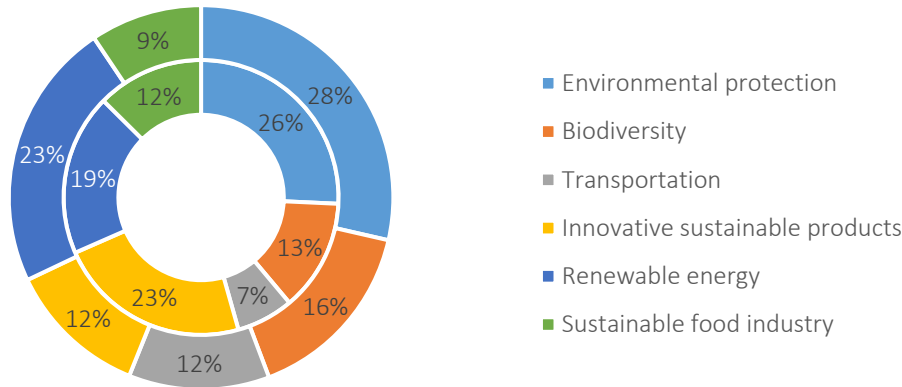


Figure 2. The problems of GHP from the customers' point of view as of June 2022

Source: Self-edited.



**Figure 3.** Sectoral investment interest of residential (outer arc) and corporate (inner arc) respondents (June 2022)

### 3.2.2. Green investments

A group of residents and entrepreneurs were asked which of the green areas they would invest in. According to Figure 3, the most attractive in both segments is environmental protection in general, while they would also favor investing in projects supporting renewable energies.

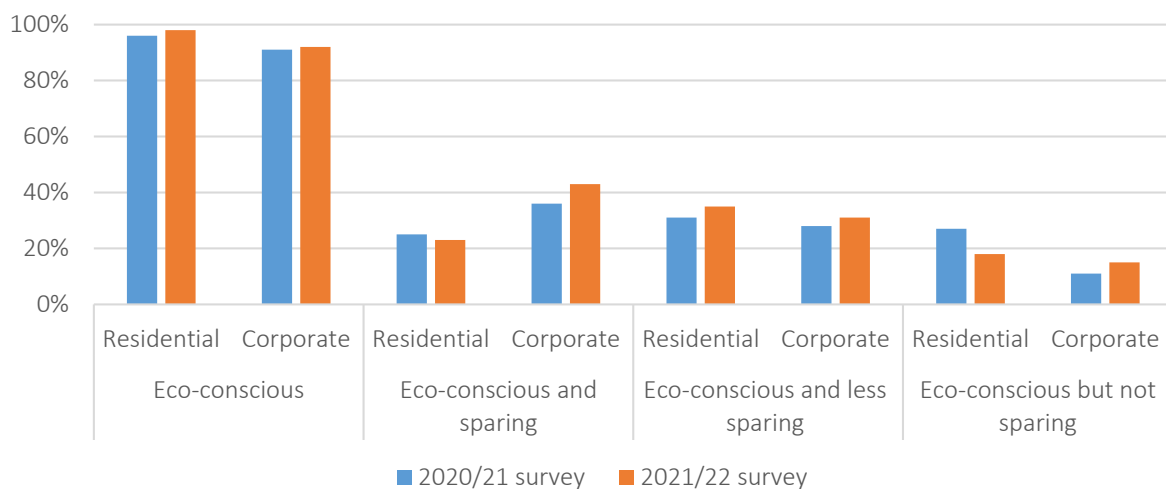
### 3.3. Sustainability attitude of residential and corporate respondents

The sustainability attitude and environmental awareness of the respondents were assessed. 98% of the public respondents claimed to be environmentally conscious, and 23% claimed to be both environmentally conscious and sparing, while the proportion of those who are sparing but less en-

vironmentally conscious is much higher (35 percent). 18 percent of the surveyed residents are not sparing at all. Compared with the results of our 2020/21 survey, the change in the proportion of respondents is various, however, the proportion of general environmental awareness improved by 2 percentage points (Figure 4).

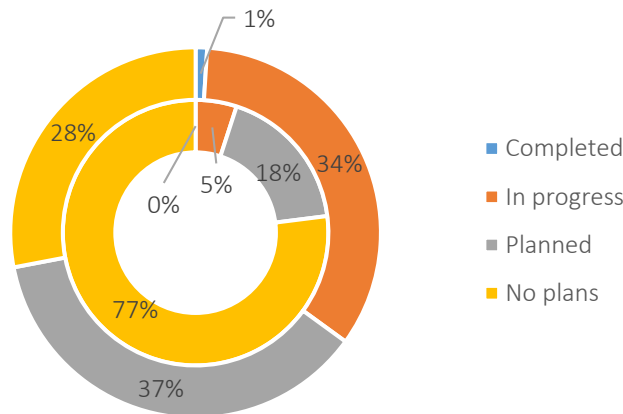
The surveys for companies show more favorable results: 92% of the asked company managers (thus companies) claimed to be environmentally conscious, and 43% declared themselves to be environmentally conscious and sparing at the same time, while the proportion of those who are sparing but less environmentally conscious is much lower (31 percent). 15 percent of the surveyed corporate respondents are not sparing at all. It is a significant improvement (excluding those with not sparing attitude) that the participants of our

Source: Self-edited.



**Figure 4.** Eco-consciousness of residential and corporate respondents

Source: Self-edited.



Note: Outer arc – 2021/22 survey; inner arc – CBH, 2022a.

**Figure 5.** The activity of banks related to the establishment of a green transition plan with climate goals

more recent research represented themselves in a higher proportion in the categories than the respondents of our 2020/21 survey; it should be emphasized that in addition to a positive change of 1 percentage point in general environmental awareness, a 7 percentage point improvement in the ratio of environmentally conscious and at the same time sparing company (managerial) behavior can be observed (Figure 4).

picture by 2022 than that from the CBH's results for 2021 (Figure 5).

As a sequence for that presented in the CBH Report, representatives of Hungarian banks were asked about their sustainable credit risk plans a year later. It was indicated that bank tendencies presented in the CBH's 2021 questionnaire survey became more favorable by 2022 (Figure 6).

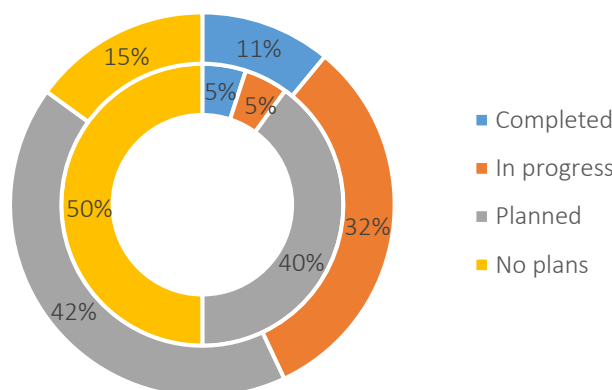
### 3.4. Green transition risks in the Hungarian banking sector

During this study, representatives of Hungarian banks were also interviewed in 2022 about their green transition plan. According to this previous, the transition structure depicts a more favorable

### 3.5. Recent challenges caused by the energy crisis

During the 2021/22 survey, respondents were asked how they evaluate the issue of the energy crisis in relation to the development of the Hungarian green market. According to 96% of the participants, the

Source: Self-edited.



Note: Outer arc – 2021/22 survey; inner arc – CBH, 2022a.

**Figure 6.** The activity of banks related to the establishment of sustainable credit risk plans at the end of 2021



energy crisis is considered an extraordinary risk. According to 87% of the respondents, energy supply security is the most worrying issue. 97% of the respondents consider that the solution would be the development of green financial products that would support the introduction, domestic production, and stabilization of other technologies on the market that eliminate energy dependence. 36% of those asked have already taken steps to introduce energy-efficient solutions, while 67% are unsure about the future. 35% of the respondents would not change their current investment policy, however, the proportion of those who are unsure is significant (52%). Both residential customers (56%) and domestic corporate customers (67%) trust the stability and lending ability of the Hungarian banking system.

## 4. DISCUSSION

It was found in this paper that residential and corporate knowledge of green instruments is expanding, with minor differences between the two groups of respondents. In the Hungarian green market, since early 2019, several green initiatives have been launched, the basis of which is the Green Program of the Central Bank of Hungary (CBH, 2022a). Deák (2022) found that in the same period, bonds and funds have been intensively and increasingly promoted by the government on various platforms, which triggered better visibility and increased purchase propensity of these products; this latter relationship was also observed by Wang et al. (2019) in an international level. As a result, the share of green bonds in the Hungarian bond portfolio was 14 percent at the end of 2021, which was a significant improvement compared to the 5.6 percent recorded in the same period of the year prior to that (CBH, 2021). These explain the general increase in the degree of knowledge even within one year shown in this paper. However, improvement in green knowledge from one year to the next is not unprecedented; it was presented for other countries as well with the remark that the gap is progressively narrowing in terms of green banking attitudes between residents of countries from eastern and ones from western states (Kuchinka et al., 2018).

It was demonstrated by assessing the most popular green loan product (Green Home Program) in detail that residential bank customers perceive sever-

al factors hindering its implementation. In accordance with the results in this paper, Nachammai and Manju (2019) also found that required general lead time, complicated documentation, and administration issues are among the main concerns of the lending process. According to Bao and He (2022), bank management and loan preferences can extensively alter the implementation efficiency of green loans, which, at the same time, fundamentally influences the customer's perception of the whole process. Based on the results, stakeholders are suggested to focus on the limitations presented, by which not only the lending experience could be improved but the general customer perception of green banking would be enhanced.

A more favorable image was built regarding the field of investments: residential investments are mainly directed to environmental, biodiversity, and renewable segments. Since 2021, as major incentives, climate-friendly and environmental aspects have already appeared in private investment funds, as well as in private and venture capital funds. According to the CBH, there are currently four private and venture capital funds in Hungary, which were created specifically for sustainability (HVCA, 2022). According to Herath and Wanninayke (2009), investment preferences are highly dependent on education level and income. Beyond this previous, the driving forces determining investment directions (e.g.: business strategies, and future greening plans) are so complex and interrelated that multiple analyses are needed to make proven statements (Chițimiea et al., 2021). The differences in investment directions between residential and corporate respondents can be related to these previous; promoted issues such as environmental protection, biodiversity, transportation, and renewables are subject to higher interest on a personal scale compared to innovative sustainable products and the sustainable food industry, which are more closely related to corporate activity preferences.

The sustainability attitude assessment of both residential and corporate survey participants resulted in an over 90 percent share of generally eco-conscious respondents, even with a slight improvement from one year to the next. The CBH Report pointed out that there is a correlation between environmental awareness and the households' fi-

nancial attitude, just as mutual positive feedback can be assumed between the market presence of green financial products and the sustainability attitude of the stakeholders; financially conscious households make more environmentally friendly consumer decisions, based mainly on savings considerations. Among the environmentally conscious actions, the population takes those that have tangible financial benefits even in the short term (CBH, 2022a). The very high level of eco-consciousness from residential and corporate customers is a beneficial sign for the Hungarian green market, while it was previously found that this attitude has a great influence on customers' intention to take green products (Milicevic et al., 2023). It can be assumed by these results that propagation of green attitude interrelates with the spread of green financial products in Hungary, thereby fostering the persistent development of each other.

As can be seen, major improvement occurred during the course of only one year in terms of the bank's establishment of a green transition plan with both climate goals and a sustainable credit risk plan. It appears that more and more institutions realize that it is of key importance that the banks identify the risks arising from climate change to be able to manage the factors threatening sustainable operation (Semieniuk et al., 2020). As a further potential driving force, Ritter (2022) found that the Hungarian banking sector is, based on its geographical characteristics, exposed to climate change-related risks more than other member states of the European Union. Further, the effects of active presentation of green transition requirements on an international and national scale seems to be verified by the findings of this research; banks adopt an increasing number of actions toward achieving green goals, shown especially for the share increase of ongoing sustainability-based procedures.

The CBH Report highlights that nearly 20 percent of the surveyed banks were able to assess and quantify the effects of credit risk and climate risk, underlining that about 40 percent of the banks have already included a certain form of ESG risk assessment in their customer and transaction due diligence procedures and lending policies (CBH, 2022a). This is largely in line with the practice typical of large banks in eurozone countries based on

the ECB's survey (ECB, 2022). These afore statements and the findings of this research show that, in relation to the EU state best practices, an intensive closing up of the Hungarian green banking preferences has been started in 2022. Additionally, however, operational-based factors such as market-, physical-, reputational-, and legal risks are frequently named as relevant risks in terms of credit risk and climate change, but their effective measurement is still considered insufficient even in international respect (Park & Kim, 2020). To get a more comprehensive view of the risk integration of Hungarian banking practices, the (survey-based) evaluation and analyses of afore operational risks should be reasonable, thereby giving further impetus to the development of the domestic green banking system and establishing schemes to be followed toward the minimization of vulnerability caused by unrevealed concerns.

As presented, respondents are determined that the current energy crisis is a major risk with energy supply security being the greatest concern. As the manifestation of these results, Borowski (2022) found that recent EU efforts towards a zero-carbon economy can be suppressed by the fact that several member states are compelled to prioritize fossil resources previously set aside. In the case of Hungary, this phenomenon bears the risk of further, at least temporarily, increasing energy dependency, which is supported by the relatively low share of renewable-based energy production (Szabo et al., 2021). It is, however, counteracted by the initiatives of the Hungarian government previously demonstrated to support the green transition in and out of the banking sector; among others, the emphasis placed on the exploitation of solar energy can be considered the way out (Kumar et al., 2021). This sustainable approach of the government seems to be adopted by households, that – aside from a minor share of respondents – support the employment of novel green solutions at least by intention. In other words, endeavors from the Hungarian government to mitigate the risks and negative impacts of the energy crisis are salient, which tend to help customers trust in the stability of the banking system even under volatile circumstances; although statistical confirmation of the real impact of the government's influence on personal opinion would be substantial in further studies.



## CONCLUSIONS

The purpose of this study was to assess the opinions and observations of residential and corporate bank customers on the Hungarian green financial market and its characteristics in response to the green transition and energy crisis in the early 2020s. To evaluate these parameters, two questionnaire surveys were conducted for two consecutive years. Moderate and various knowledge was demonstrated on green financial instruments with minor differences between residential and corporate respondents. Several concerns were reported regarding the implementation of other green products (e.g.: GHP loan), while the investment preferences were found to be different between residential and corporate interested members, with environmental protection being the most favored investment for both groups. The general eco-consciousness of the two groups is high. It was also indicated that banks realize the importance of sustainability and climate risk assessment, however, effective progress steps are still unfolding. Respondents also identify the risks related to the energy crisis, while their trust in the banking system remains even under volatile circumstances. Undoubtedly, future studies must focus on the in-depth analysis of afore issues, complemented by the involvement of other variables influencing the green market and the assessment of a wider range of factors affecting the green transition on Hungary.

## AUTHOR CONTRIBUTIONS

Conceptualization: Anita Boros, Csaba Lentner.

Data curation: Anita Boros.

Formal analysis: Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tőzsér.

Investigation: Anita Boros, Csaba Lentner.

Methodology: Anita Boros.

Project administration: Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tőzsér.

Supervision: Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tőzsér.

Validation: Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tőzsér.

Visualization: Anita Boros, Dávid Tőzsér.

Writing – original draft: Anita Boros, Dávid Tőzsér.

Writing – review & editing: Anita Boros, Csaba Lentner, Vitéz Nagy, Dávid Tőzsér.

## REFERENCES

- Bao, J., & He, M. (2022). Does green credit promote green sustainable development in regional economies? – Empirical evidence from 280 cities in China. *PlosOne*, 17(11), e0277569. <https://doi.org/10.1371/journal.pone.0277569>
- Boiko, A., Umantsiv, Y., Cherlenjak, I., Prikhodko, V., & Shkuro-padska, D. (2022). Policy measures for economic resilience of Visegrad Group and Ukraine during the pandemic. *Problems and Perspectives in Management*, 20(2), 71-83. [https://doi.org/10.21511/ppm.20\(2\).2022.07](https://doi.org/10.21511/ppm.20(2).2022.07)
- Boros, A., & Huszár, B. E. (2021). Green financial products in the European banks' portfolio – with a Hungarian perspective. *Civic Review*, 17, 141-152. <https://doi.org/10.24307/psz.2021.0010>
- Borowski, P. F. (2022). Mitigating climate change and the development of green energy versus a return to fossil fuels due to the energy crisis in 2022. *Energies*, 15(24), 9289. <https://doi.org/10.3390/en15249289>
- Cao, C., Tong, X., Chen, Y., & Zhang, Y. (2022). How top management's environmental awareness affect corporate green competitive advantage: evidence from China. *Kybernetes*, 51(3), 1250-1279. <https://doi.org/10.1108/K-01-2021-0065>
- CBH. (2019). *Act CXXXIX of 2013 on the Magyar Nemzeti Bank*. (In Hungarian). Retrieved from <https://www.mnb.hu/letoltes/mnb-torveny-2019-04-05-en.pdf>
- CBH. (2021). *Zöld Pénzügyi Jelentés, Helyzetkép a magyar pénzügyi rendszer környezeti fenntarthatóságáról [Green Financial Report, Situation on the environmental sustainability of the Hungarian financial system]*. (In Hungarian). Retrieved from <https://www.mnb.hu/letoltes/20210303-zold-penzugyi-jelentes.pdf>
- CBH. (2022a). *Zöld Pénzügyi Jelentés [Green Financial Report]*. (In Hungarian). Retrieved from <https://www.mnb.hu/letoltes/zold-penzugyi-jelentes-2022-2.pdf>
- CBH. (2022b). *Családi Zöld Pénzügyek [Family Green Finances]*. (In Hungarian). Retrieved from [http://dx.doi.org/10.21511/bbs.18\(1\).2023.10](http://dx.doi.org/10.21511/bbs.18(1).2023.10)

- <https://www.mnb.hu/fogyasztovedelem/csaladi-zold-penzugyek>
10. CBH. (2022c). *Tájékoztató a lakáscélú Zöld Tőkekövetelménykedvezmény Program módosított feltételeiről [Information on the modified conditions of the Green Capital Requirement Discount Program for residential purposes]*. (In Hungarian). Retrieved from <https://www.mnb.hu/letoltes/tajekoztato-lakascelu-zold-tokekedvezmeny.pdf>
  11. CBH. (2022d). *Tájékoztató a zöld vállalati és önkormányzati tőkekövetelménykedvezmény kiegészítéséről [Information on the addition of the Green Corporate and Local Government Capital Requirement Discount Program]*. (In Hungarian). Retrieved from <https://mnb.hu/letoltes/zold-vallalati-es-onkormanyzati-tokekovetelmeny-kedvezmeny.pdf>
  12. CBH. (2022e). *NHP Zöld Otthon Program. [FGS Green Home Program]*. (In Hungarian). Retrieved from <https://www.mnb.hu/zold-otthon-program>
  13. CBH. (2022f). *Az MNB zöld jelzáloglevelek jövőbeni kibocsátását és a zöld jelzáloghitelek elterjedését támogatja a forint lejáratú összhangra vonatkozó szabályozás módosításával [The CBH supports the future issuance of green mortgage bonds and the spread of green mortgage loans by amending the regulations on forint maturity harmonization]*. (In Hungarian). Retrieved from <https://www.mnb.hu/sajto-szoba/sajtokozlemenyek/2021-evi-sajtokozlemenyek/az-mnb-zold-jelzalogvelek-jovobeni-kibocsatasat-es-a-zold-jelzaloghitelek-elterjedeset-tamogatja-a-forint-lejarati-osszhangra-vonatkozoz-szabalyozas-modositasaval>
  14. Chen, J., Siddik, A. B., Zheng, G. W., Masukujjaman, M., & Bekhzod, S. (2022). The effect of green banking practices on banks' environmental performance and green financing: An empirical study. *Energies*, 15(4), 1292. <https://doi.org/10.3390/en15041292>
  15. Chițimiea, A., Minciu, M., Manta, A. M., Ciocoiu, C. N., & Veith, C. (2021). The drivers of green investment: A bibliometric and systematic review. *Sustainability*, 13(6), 3507. <https://doi.org/10.3390/su13063507>
  16. Deák, V. (2021). The MNB' Green Programme. *Civic Review*, 17, 153-163. <https://doi.org/10.24307/psz.2021.0011>
  17. Donthu, N., & Gustafsson, A. (2020). Effects of COVID-19 on business and research. *Journal of Business Research*, 117, 284-289. <https://doi.org/10.1016/j.jbusres.2020.06.008>
  18. ECB. (2022). *Az EKB éghajlattal kapcsolatos programja 2022-ben [The ECB's climate agenda for 2022]*. (In Hungarian). Retrieved from [https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr220704\\_annex~cb39c2dcbb.hu.pdf](https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr220704_annex~cb39c2dcbb.hu.pdf)
  19. EEMI. (2022). *The Energy Efficient Mortgages Initiative at a glance*. Retrieved from <https://energyefficientmortgages.eu>
  20. Eurostat. (2008). *NACE Rev. 2, Statistical classification of economic activities in the European Community*. Retrieved from <https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF.pdf/dd5443f5-b886-40e4-920d-9df03590ff91>
  21. Ferreira, J., & Morais, F. (2022). Does the Coronavirus Crash affect green equity markets' efficiency? A multifractal analysis. *Journal of Sustainable Finance & Investment*. <https://doi.org/10.1080/20430795.2022.2105787>
  22. Government Debt Management Agency Pte. Ltd. (AKK). (2021). *Hungary Green Bond Allocation Report 2020*. Retrieved from <https://akk.hu/download?path=d8776dc8-62b1-4f60-8ae4-4a2727529d02.pdf>
  23. Herath, R. R., & Wanninayke, W. M. C. B. (2009). The attitudes of customers towards green investments. *Journal of Management*, 5(1), 22-30. <http://repository.kln.ac.lk/handle/123456789/11109>
  24. HSCO. (2020). *Magyarország, 2020. I–III. negyedév [Hungary, 2020. Q1–Q3]*. Retrieved from <https://www.ksh.hu/docs/hun/xftp/idoszaki/mone/20203/index.html>
  25. HSCO. (2021). *Beruházások – A beruházások volumenváltozása anyagi-műszaki összetétel szerint [Changes in the volume of investments according to material and technical composition]*. (In Hungarian). Retrieved from <https://ksh.hu/s/helyzetkep-2021/#/kiadvany/beruhazas>
  26. HSCO. (2022). *A fenntartható fejlődés indikátorai Magyarországon, 2021 [Indicators of sustainable development in Hungary, 2021]*. (In Hungarian). Retrieved from [https://www.ksh.hu/docs/hun/xftp/idoszaki/fenntartfejl/2021/fenntarthatos\\_fejlodes\\_indikatorai\\_2021.pdf](https://www.ksh.hu/docs/hun/xftp/idoszaki/fenntartfejl/2021/fenntarthatos_fejlodes_indikatorai_2021.pdf)
  27. HVCA. (2022). *Venture Capital and Private Equity update Hungary – Q1 2022*, Retrieved from [https://www.hvca.hu/documents/HVCA\\_Investment\\_monitoring\\_report\\_Q1\\_2022\\_KK\\_v2final.pdf](https://www.hvca.hu/documents/HVCA_Investment_monitoring_report_Q1_2022_KK_v2final.pdf)
  28. Ibe-enwo, G., Igbudu, N., Garantie, Z., & Popoola, T. (2019). Assessing the relevance of green banking practice on bank loyalty: The mediating effect of green image and bank trust. *Sustainability*, 11(17), 4651. <https://doi.org/10.3390/su11174651>
  29. Khan, S. A. R., Yu, Z., & Umar, M. (2021). How environmental awareness and corporate social responsibility practices benefit the enterprise? An empirical study in the context of emerging economy. *Management of Environmental Quality*, 32(5), 863-885. <https://doi.org/10.1108/MEQ-08-2020-0178>
  30. Kostenko, A., Kozyntseva, T., Opanasiuk, V., Kubatko, O., & Kuppenko, O. (2022). Social resilience management of Ukrainian territorial communities during the Covid-19 pandemic. *Problems and Perspectives in Management*, 20(3), 1-11. [https://doi.org/10.21511/ppm.20\(3\).2022.01](https://doi.org/10.21511/ppm.20(3).2022.01)
  31. Kuchinka, D. G. J., Balazs, S., Gavriletea, M. D., & Djokic, B. B. (2018). Consumer attitudes toward sustainable development and risk to brand loyalty. *Sustainability*, 10(4), 997. <https://doi.org/10.3390/su10040997>

32. Kumar, B., Szepesi, G., Čonka, Z., Kolcun, M., Péter, Z., Berényi, L., & Szamosi, Z. (2021). Trend-line assessment of solar energy potential in Hungary and current scenario of renewable energy in the Visegrád Countries for future sustainability. *Sustainability*, 13(10), 5462. <https://doi.org/10.3390/su13105462>
33. Milicevic, N., Djokic, N., Mirovic, V., Djokic, I., & Kalas, B. (2023). Banking support for energy security: The customer aspect. *Sustainability*, 15(1), 112. <https://doi.org/10.3390/su15010112>
34. Moon, Z. H., & Hasan, M. M. (2022). Impact of COVID-19 on green financial practices of banks and financial institutions in Bangladesh. *Journal of Business and Social Sciences Research*, 7(1), 21-40. <https://doi.org/10.3126/jbssr.v7i1.47682>
35. Nachammai, S., & Manju, N. (2019). Problems faced by the customers regarding the borrowing of the loan in State Bank of India – An analysis. *Journal of Emerging Technologies and Innovative Research*, 6(11), 978-981. Retrieved from [https://www.academia.edu/42081926/PROBLEMS\\_FACED\\_BY\\_THE\\_CUSTOMERS\\_REGARDING\\_THE\\_BORROWING\\_OF\\_THE\\_LOAN\\_IN\\_STATE\\_BANK\\_OF\\_INDIA\\_AN\\_ANALYSIS](https://www.academia.edu/42081926/PROBLEMS_FACED_BY_THE_CUSTOMERS_REGARDING_THE_BORROWING_OF_THE_LOAN_IN_STATE_BANK_OF_INDIA_AN_ANALYSIS)
36. Naidoo, R., & Brendan, F. (2020). Reset sustainable development goals for a pandemic world. *Nature*, 583, 198-201. <https://doi.org/10.1038/d41586-020-01999-x>
37. Ngo, T. Q., Doan, P. N., Vo, L. T., Tran, H. T. T., & Nguyen, D. N. (2021). The influence of green finance on economic growth: A COVID-19 pandemic effects on Vietnam Economy. *Cogent Business & Management*, 8(1), 2003008. <https://doi.org/10.1080/23311975.2021.2003008>
38. OTP Bank. (2021). *A hazai piacon elsőként zöld jelzaloglevelet hozott forgalomba az OTP Csoport [The OTP Group was the first to introduce green mortgage bonds on the domestic market]*. (In Hungarian). Retrieved from [https://www.otpbank.hu/portal/hu/Hirek/Zold\\_jelzaloglevel](https://www.otpbank.hu/portal/hu/Hirek/Zold_jelzaloglevel)
39. Park, H., & Kim, J. D. (2020). Transition towards green banking: role of financial regulators and financial institutions. *Asian Journal of Sustainability and Social Responsibility*, 5, 5. <https://doi.org/10.1186/s41180-020-00034-3>
40. Risal, N., & Joshi, S. K. (2018). Measuring green banking practices on bank's environmental performance: Empirical evidence from Kathmandu valley. *Journal of Business and Social Sciences*, 2(1), 44-56. <https://doi.org/10.3126/jbss.v2i1.22827>
41. Ritter, R. (2022). Banking sector exposures to climate risks – Overview of transitional risks in the Hungarian corporate loan portfolio. *Financial and Economic Review*, 21(1), 32-55. <https://doi.org/10.33893/FER.21.1.32>
42. Satheesh Kumar, C. (2017). A study on customers awareness on green banking initiatives in selected private sector banks with reference to Kunnankulam Municipality. *SSRG International Journal of Economics and Management Studies*, 4(3), 40-42. <https://doi.org/10.14445/23939125/IJEMS-V4I3P109>
43. Semieniuk, G., Campiglio, E., Mercure, J. F., Volz, U., & Edwards, N. R. (2020). Low-carbon transition risks for finance. *WIREs Climate Change*, 12(1), e678. <https://doi.org/10.1002/wcc.678>
44. Sharabati, A. A. A., Al-Haddad, S., Judeh, M., & Al-Badawi, B. (2022). Brand extension and purchase intention of Jordanian banks' clients. *Innovative Marketing*, 18(2), 60-71. [https://doi.org/10.21511/im.18\(2\).2022.06](https://doi.org/10.21511/im.18(2).2022.06)
45. Shkarupa, O., Vlasenko, D., Vesperis, S., Treus, A., & Juhaszova, Z. (2021). Strategic management or sustainable decisions in business: A case of greening the transport companies. *Problems and Perspectives in Management*, 19(4), 311-324. [https://doi.org/10.21511/ppm.19\(4\).2021.25](https://doi.org/10.21511/ppm.19(4).2021.25)
46. Smit, S., Jánoskúti, L., Havas, A., Puskás, P., & Békés, M. (2020). *Repülőrajt – A magyar gazdaság növekedési pályája 2030-ig [Take off – The growth trajectory of the Hungarian economy until 2030]*. (In Hungarian). Retrieved from <https://www.mckinsey.com/hu/~media/McKinsey/Locations/Europe%20and%20Middle%20East/Hungary/Our%20Insights/Flying%20start%20Powering%20up%20Hungary%20for%20a%20decade%20of%20growth/McK-Hungary-2030-Report-HU.pdf>
47. Szabo, J., Weiner, C., & Deák, A. (2021) Energy Governance in Hungary. In M. Knodt & J. Kemmerzell (Eds.), *Handbook of Energy Governance in Europe* (pp. 1-32). Cham: Springer. [https://doi.org/10.1007/978-3-319-73526-9\\_13-2](https://doi.org/10.1007/978-3-319-73526-9_13-2)
48. Tan, L. P., Sadiq, M., Aldeehani, T. M., Ehsanullah, S., Mutira, P., & Vu, H. M. (2022). How COVID-19 induced panic on stock price and green finance markets: global economic recovery nexus from volatility dynamics. *Environmental Science and Pollution Research*, 29(18), 26322-26335. <https://doi.org/10.1007/s11356-021-17774-y>
49. Velenturf, A. P., & Purnell, P. (2021). Principles for a sustainable circular economy. *Sustainable Production and Consumption*, 27, 1437-1457. <https://doi.org/10.1016/j.spc.2021.02.018>
50. Versal, N., & Sholoiko, A. (2022). Green bonds of supranational financial institutions: On the road to sustainable development. *Investment Management and Financial Innovations*, 19(1), 91-105. [https://doi.org/10.21511/imfi.19\(1\).2022.07](https://doi.org/10.21511/imfi.19(1).2022.07)
51. Wang, H., Ma, B., & Bai, R. (2019). How does green product knowledge effectively promote purchase intention? *Sustainability*, 11(4), 1193. <https://doi.org/10.3390/su11041193>
52. WHO. (2022). *Hungary Situation*. Retrieved from <https://covid19.who.int/region/euro/country/hu>
53. Widyawati, L. (2019). A systematic literature review of socially responsible investment and environmental social governance metrics. *Business Strategy and the Environment*, 29(2), 619-637. <https://doi.org/10.1002/bse.2393>