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SMART STRUCTURING AND MONITORING OF CAUSAL DYNAMICS BETWEEN GUIDELINES AND PRIORITIES OF BANCO DE PORTUGAL UNDER THE 2021-25 STRATEGIC PLAN

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Abstract. In 2021, Banco de Portugal started a new cycle of strategic planning. The Banco de Portugal's fourth strategic plan (i.e., PE21-25) was published at the institutional website, and defines 35 priorities/objectives grouped into five strategic guidelines. The interrelationships and causal dynamics of those guidelines and priorities are the core of the current research. The main purpose is to develop a set of actions aiming at producing recommendations for prioritizing the 35 strategic objectives using the Decision MAking Trial and Evaluation Laboratory (DEMATEL) method. The objective is to develop a constructivist procedure that, with the direct collaboration of a panel of relevant decision makers, grants the analysis objectivity and empirical substance for making recommendations at the strategic level. Contributing to the literature on central banking strategic planning is an additional objective. The results of the DEMATEL application include the identification of three priorities as central factors (i.e., high prominence and high relationship), and a hierarchical list of the PE21-25 strategic priorities analyzed, including their cause-and-effect relationships.

Keywords: central banking strategic planning, DEMATEL, multiple criteria decision analysis (MCDA), SMART prioritization, strategy, Banco de Portugal.

JEL Classification: L10, L20, M10.

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Introduction

Central banks' mandates contain statutory and comprehensive objectives coming from outside. As Bryson (1988, p. 116) refers, *"mandates are imposed from the outsider and may be considered the "musts" that the organization is required to do"*. Conceptually, a strategic plan is established by the management board and may define some specific priorities for the medium term, usually within the horizon of the planning exercise. The possibility that all the main tasks of a central bank are made explicit in the strategic plan is an indication that the strategic plan was – or is being – defined too broadly.

In 2021, Banco de Portugal began its fourth cycle of strategic planning, with the motto: *Promoting proximity and strengthening trust*. Banco de Portugal's (2021) strategic plan 2021–2025 (hereafter, SP21-25) defines 35 priorities/objectives by 2025, which are aggregated in five strategic guidelines. This study specifically addresses the interrelations and causal dynamics between the five strategic guidelines and the 35 priorities of the SP21-25. It aims to provide new insights on the simplification of contents of the central bank's strategic plans. The simplification of content refers to a reduction or prioritization of strategic objectives that will bring focus and benefits to the implementation phases. In other words, the more comprehensive the strategic plan is, the easier it will be to control and to evaluate its implementation. In this background, this study addresses techniques associated with the Multiple Criteria Decision Analysis (MCDA) approach, specifically the DEcision MAking Trial and Evaluation Laboratory (DEMATEL) technique (Gabus & Fontela, 1972). This technique is known for fostering more informed and conscious decision making based on variable-change analysis (*cf.* Milici et al., 2023). In fact, two of DEMATEL's key features are the capacity to include qualitative and quantitative criteria and accommodate their interdependence when analyzing cause-and-effect relationships. The main purpose is to reach recommendations, with objectivity and empirical substance, on a hierarchical list of the priorities of the SP21-25.

Given the idiosyncratic nature of central banks and the limitation of the literature on central banks' strategic plans, this research applies a constructivist and collaborative approach to attain a set of specific medium term strategic priorities (i.e., to develop a set of actions for hierarchizing the SP21-25 strategic priorities), considering the participation and experience of relevant decision makers. We have found no prior research using the DEMATEL technique to improving the decision-making process in the specific case on the strategic priorities of the SP21-25. This allowed for an innovative, very interesting holistic view of the decision situation through easy-to-interpret diagrams.

The first section is dedicated to the literature review and research gap, with a theoretical framework on the concepts of corporate strategy and strategic planning, as well as its suitability to central banks' activities. Section two describes the methodological framework, with a general contextualization of Problem Structuring Methods (PSMs) (Rosenhead, 1989) and detailed explanation of the DEMATEL technique. Section three comprises the development of the empirical component of the study, mainly the processing of the influences discussed by decision-makers under DEMATEL technique. The last section sums up the overall conclusions and presents suggestions for future research.

1. Literature review and research gap

There are numerous definitions of Strategy. Grant's (2018) definition is perhaps one of the simplest. According to the author, *"in its broadest sense, strategy is the means by which individuals or organizations achieve their objectives"* (p. 14). In very wide terms, from a historical evolution perspective, strategy concepts can be divided into two moments (i.e., before and after the end of the 80s of the twentieth century). The first moment relies on the importance of the external environment, and consequently the results of a company depend intrinsically on the ability to deal with the opportunities and challenges of the environment. As Porter (1980, p. 4) points out, *"the goal of competitive strategy for a business unit in an industry is to find a position in the industry where the company can best defend itself against these competitive forces or can influence them in its favor"*. Organizations had to achieve a certain competitive advantage (Porter, 1985) and, in this sense, the main development of strategic analysis was based on the link between strategy and the external environment. The second moment endorses the importance of internal resources in the differentiation of business performance. The resource-based vision (Barney, 1991) considers internal resources and capabilities, tangible and intangible, as determinant factors for succeeding. Capabilities that can overcome changes in the external environment are known as "dynamic capabilities". *"The term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment"* (Teece et al., 1997, p. 7). Furthermore, the 21st century has added more challenges to strategic management, notably due to globalization, financial crises and a very rapid and significant technological transformation (*"digital transformation is not about technology – it is about strategy and new ways of thinking* […] *Digital transformation requires a holistic view of business strategy"* (Rogers, 2016)). On the path of innovation, Kim and Mauborgne (2004, 2009), and Kim (2005) conceptualize the "red oceans" and the "blue oceans" for the business universe, in which the latter represent what (still) does not exist – i.e., the unknown market – in which demand is created (and not disputed).

When focusing the literature on strategic planning for central banks, as non-private organizations, which do not intend to maintain competitive advantages over competition (in fact, they have no competitors), the output is scarce, although central banks have responsibilities to stakeholders and are subject to public scrutiny. The principles and tools of strategic planning have been settled primarily for private and profit driven organizations but are conceptually applicable cross-sectors (Bivainis & Tunčikiene, 2005; Poister, 2010; Grant, 2018). Therefore, the main steps for the development of strategic plans, as defined by Hunger and Wheelen (1995), are also valid. That is: (1) environmental scanning; (2) strategy formulation; (3) strategy implementation; and (4) evaluation and control.

Although there is well-established literature on topics of central banks' missions and issues related to economic growth and public policies, little consideration has been given to the literature on strategic planning at central banks. Another gap is the lack of empirical research on the strategic formulation at central banks, even considering benchmark exercises. The comparison between central banks can easily be biased by the differences in the mandates,

by the non-disclosing of the strategic plans (or their details), by the differences of maturity or terminologies used.

Sevet and de la Cuesta (2021) provided an appropriate analysis on the developments in the strategy function in central banks and supervisors in 2020. On the content of the strategy, 85% of central banks have up to 5 pillars or guidelines, of which 69% address statutory and transversal themes. Regarding the number of strategic objectives/priorities, 25% of participating central banks have more than 20 objectives per strategic cycle. The outcome were summed up as follows: *"*(*i*) *The journey towards an effective Strategy function will remain a long and challenging one*; (*ii*) *The tipping point for many institutions will be to clarify the purpose and streamline the content of their strategic plan*; (*iii*) *Gradually yet irreversibly, central banks will recognise the unique purpose and value of Strategy – a powerful instrument helping them to sail through unique circumstances within an ever-changing world, and therefore a great opportunity to remain true to their mandates*" (Sevet & de la Cuesta, 2021, p. 17).

As there is dearth of studies on central banking strategic planning, the purpose of this paper is also to expand the understanding of methodological approaches that can be applied for analyzing the formulation of priorities in upcoming exercises.

2. Methodological framework

The inference of the causation dynamics between the strategic orientations and the priorities structured within the scope of the SP21-25 constitutes a constructivist epistemological approach (*cf.* Belton & Stewart, 2002), which combines the specific central banks' features and the experience of the panel participants on the workgroup session. According to Barger et al. (2018, p. 3), *"constructivism generally refers to a philosophical viewpoint that assumes no single objective reality exists* [...], *and that truth must be constructed* [...]*"*, which can mean that the constructivist and collaborative approach can bring gains in the level of the creation of new knowledge (i.e., truth construction).

2.1. Problem structuring methods

Problem Structuring Methods (PSMs) are methods of structuring complex decision-making problems developed in operational research (OR). *"*[...U]*ntil the* [*19*]*60s, operational research was dominated by the paradigm of the search for the optimal*" (Ferreira, 2011, p. 68–69). The concept of mathematical optimum, also called a *hard approach*, is closely linked to the application of mathematical models whose sole purpose is the optimization of a significant amount of data. The second concept – i.e., *soft approach* – appears as an alternative to optimization mechanics, accepting the inclusion of subjective elements with the active participation of people in the decision-making process. This soft approach is complementary to traditional procedures (Mingers & Brocklesby, 1997; Mingers & Rosenhead, 2004). The evolution from hard to soft approaches configures two multicriteria methods to support decision-making, namely: (1) Multiple Criteria Decision Making (MCDM); and (2) Multiple Criteria Decision Analysis (MCDA), respectively (Belton & Stewart, 2002).

The PSM approach is systemic and seeks to identify the causal relationships between the elements under analysis. The PSMs aim to build understanding and commitment among stakeholders involved in the decision-making process, through the development of workshops with the help of a facilitator. Some of the existing PSMs were analyzed by Rosenhead (1989) and reviewed by Rosenhead and Mingers (2001), namely: (1) Strategic Options Development and Analysis (SODA); (2) Soft Systems Methodology (SSM); (3) Strategic Choice Approach (SCA); (4) Robustness Analysis; and (5) Drama Theory. The PSMs can be complemented with techniques that make its application more robust. The underlying logic of PSMs is that problems must be solved with the active participation of those involved in their construction (Rosenhead & Mingers, 2001). The soft approach requires the following three phases: (1) structuring; (2) evaluation; and (3) recommendation (Belton & Stewart, 2002; Natividade et al., 2021; Rosário et al., 2021).

In this study, the strategic priorities are already structured in the five strategic guidelines, which eases the application of DEMATEL technique for the evaluation and production of recommendations.

2.2. DEMATEL

The DEMATEL technique was developed by Fontela and Gabus, between 1972 and 1976, at the Geneva Battelle Memorial Institute, with the main objective of solving complex problems in the identification of cause-effect relationships between the different variables (*cf.* Fontela & Gabus, 1976; Gabus & Fontela, 1972). The application of the DEMATEL technique has been diversifying into different areas of knowledge (Braga et al., 2021; Estiri et al., 2021), being recognized for the ability to examine the causes and effects of the relationships between factors (i.e., accepts the interdependence of concepts) and by organizing the elements in order of importance (Chen et al., 2018; Lin et al., 2021; Pinto et al., 2022; Yazdi et al., 2020).

The application of this multi-criteria technique consists in the conversion of cause-effect relationships through matrices and returns an illustration of the diagram impact relationship – i.e., information on the intensity of the relationships between causes and effects (i.e., prominence) and on their direction. According to Chen et al. (2019), Si et al. (2018) and Sumrit and Anuntavoranich (2013), the application of the DEMATEL technique is usually carried out in six steps, which can be converted into five. The present study considers the DEMATEL application carried out in five steps presented in Figure 1.

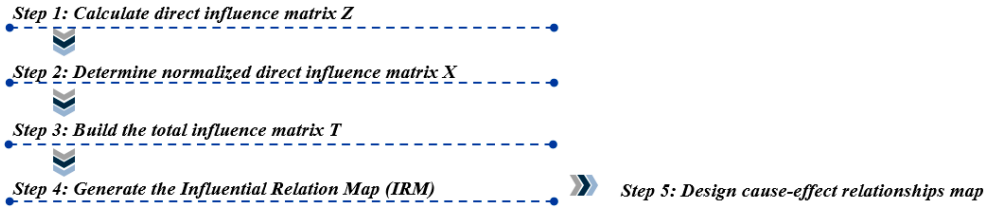

Figure 1. DEMATEL application steps (source: Adapted from Si et al., 2018)

2.2.1. Step 1: Calculate direct influence matrix *Z*

The direct influence matrix is created based on the opinion of the m decision makers in decision panel $D=\{D_1,D_2,D_3,\ldots,m\}$, with n factors $F=\{F_1,F_2,F_3,\ldots,F_n\}$. The direct influence of factor F_i on factor F_j is the degree of influence of F_i on F_j according to the following scale: 0 – no influence; 1 – low influence; 2 – average influence; 3 – high influence; and 4 – very high influence (Si et al., 2018). The direct influence matrix $Z^k=\left[z_{ij}^k\right]_{n\times n}$ considers the average weightings of the decision-makers opinion (k) and is given by the following Eq. (1):

$$Z_{ij}=\frac{1}{m}\sum_{k=1}^{m}z_{ij}^k, \text{ in which } i,j=1,2,\ldots,n. \tag{1}$$

2.2.2. Step 2: Determine normalized direct influence matrix *X*

The normalized direct influence matrix X arises from the multiplication of the direct influence matrix Z by the coefficient 1/s as shown in Eq. (2):

$$X=\frac{Z}{s}, \tag{2}$$

where s is the maximum of the total values in line or column of matrix Z (see Eq. (3)):

$$s=\max\left(\max_{1\le i\le n}\sum_{j=1}^{n}Z_{ij},\max_{1\le j\le n}\sum_{i=1}^{n}Z_{ij}\right). \tag{3}$$

2.2.3. Step 3: Build the total influence matrix *T*

The total influence matrix T computes all direct and indirect effects and is constructed from the inverse matrix $(I-X)^{-1}$. I denotes the Identity matrix. Identity matrix is a given square matrix which contains on its main diagonal elements with value of one, while the rest of the matrix elements are zero. The matrix T corresponds to Eq. (4):

$$T=(I-X)^{-1}. \tag{4}$$

It is worth noting that each cell in matrix T provides information about how factor i affects factor j. This an important step of the process because it allows for the sum of direct and indirect effects of factor i on the other factors (and vice-versa). This will then be used to provide an index of the strength of influences given and received for each factor and establish the respective coordinates in the IRM diagram.

2.2.4. Step 4: Generate the Influential Relation Map (IRM)

For the IRM, the vectors R and C represent, respectively, the sum of the total rows and the sum of the total columns of the total influence matrix T, according to Eqs. (5) and (6):

$$R=\left[\sum_{j=1}^{n}t_{ij}\right]_{n\times 1}=\left[r_i\right]_{n\times 1}=\left(r_1,\ldots,r_i,\ldots,r_n\right); \tag{5}$$

$$C=\left[\sum_{i=1}^{n}t_{ij}\right]_{1\times n}^{'}=\left[c_j\right]_{1\times n}^{'}=\left(c_1,\ldots,c_j,\ldots,c_n\right), \tag{6}$$

when r_i is the sum of the i^{th} line of the T matrix and indicates the influence value that the

factor F_i has on the other factors. The c_j is the sum of the j^{th} column of the T matrix and represents the influence value that factor F_j receives from the rest, either directly or indirectly. If $j = i$, the horizontal axis vector (R + C) indicates the total effects given and received. That is, the prominence of the model. The vertical axis vector (R − C) represents the degree of relationship – positive or negative – (i.e., if the factor F_i is in the cause or in the effect group, respectively).

As shown in Figure 2, the IRM is divided into four quadrants (Qs): 1, 2, 3, and 4. Although each Q corresponds to a specific type of factor, factors included in Q1 and Q2 are considered causes, while factors included in Q3 and Q4 are seen as effects. Specifically, Q1 contains central factors (i.e., cause criteria perceived as valuable) that are quite prominent and that have strong relationships. Q2 includes determinant factors that have little prominence but strong relationships. Q3 includes independent factors that have little prominence and weak relationships. Finally, Q4 consists of impact factors that are quite prominent but have weak relationships.

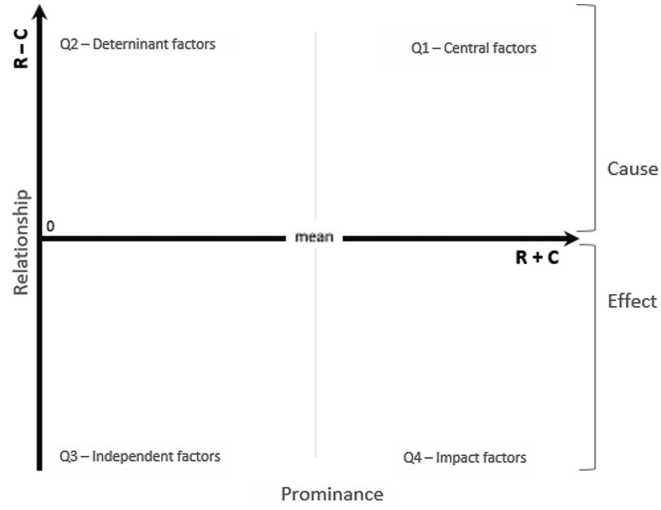

Figure 2. IRM quadrants | DEMATEL (source: Adapted from Si et al., 2018)

2.2.5. Step 5: Design cause-effect relationship map

The map of cause-effect relationships (see Figure 2) considers the combination of the pairs of coordinates (R+C) and (R–C), in which each quadrant corresponds to a certain type of factors, namely: (Q.1) central factors – high prominence and relationship; (Q.2) determinant factors – low prominence and high relationship; (Q.3) independent factors – low prominence and relationship; and, finally, (Q.4) impact factors – high prominence and low relationship. The last step is to design the relationships referring to the most significant effects from IRM map (i.e., above the threshold α value that is average of the values in the matrix T).

After setting up the main features of the DEMATEL technique, the main advantages and limitations have to be considered. According to Ho et al. (2011, p. 3), *"the technique has been successfully applied in many situations such as* [...], *development strategies*, [...] *knowl-*

edge management". This means that the DEMATEL technique helps decision makers make better decisions within uncertain environments. It is also noteworthy that it is a technique very accessible to the various actors involved in the analysis of mutual influences, direct or indirect, and in the visualization of complex decision problems (Lo et al., 2020; Singh & Sarkar, 2020; Huynh et al., 2021). The ability to visualize diagrams with the interrelationships between factors – identification of factors that have mutual influence between them or on others – as well as the identification of critical factors, constitute advantages of this technique (Si et al., 2018; Yazdi et al., 2020; Dwijendra et al., 2021). According to Chen et al. (2020), the DEMATEL technique is the most effective and viable to evaluate the cause-and-effect relationships of the factors and prioritize these factors in order of importance. Contrarily, the main limitations pointed out have to do with the possible exclusion of important factors for the decision-making process, as well as the fact that it does not consider the relative weight of decision-makers or their search for alternatives (Si et al., 2018; Costa et al., 2021; Rocha et al., 2022; Liu & Liu, 2022).

Whereas there are no limitation-free methodologies, the rationale of choosing this technique applied to the strategic priorities of the SP1-25 was a combination of: (1) it is a technique with recognized evidence in multi-criteria decision problem analyses; (2) the strategic guidelines constitute clusters and strategic priorities are the criteria or factors (no need for further structuring of the problem); (3) the application is easy for participants (no training needed); (4) the technique incorporates the contributions of the participants, since it operates by iterations; (5) a number of panelists can be considered between 5 and 7 elements (Bana e Costa et al., 2002); and (6) allows for the identification of partial improvement points and basis for reflection, instead of returning a global solution that could imply merging different points of view.

3. Application and results

This section embodies the empirical component of the study. The main objective is, through a multicriteria, constructivist and collaborative approach, to develop a set of actions that will allow to make recommendations on the SP21-25 priorities, organizing them for their relevance. *"MCDA methods have a constructivist epistemological basis and facilitate the combination of objective and subjective elements in complex and multidimensional decision problems*" (Milici et al., 2023, p. 496). Thus, starting from the structure established in PE21-25 (i.e., priorities aggregated in the five strategic guidelines), the application of the DEMATEL technique will take place followed by the analysis of the results; and, finally, the consolidation of the results and recommendations.

The first stage was to set up a panel of experts/decision-makers. There is no indication of an ideal number in the literature (i.e., *"the expert panel number is quite difficult to establish, and no study has been conclusive with respect to it"* (Salmeron, 2009, p. 276)). For the working group session, the panel was composed of six top managers of Banco de Portugal, namely: two members of the Board of Directors and four heads of department/directorate (with direct reporting to the Board).

3.1. DEMATEL application

The next step was the realization of a working session, held online, using the Zoom platform (https://zoom.us/). Since the structure of priorities defined in the SP21-25 (i.e., the 35 priorities are grouped by the five strategic guidelines (SG)), there was no need to proceed to the structuring phase of the decision-making process. However, given the asymmetric distribution of priorities by the SG, the multi-voting technique was applied to streamline the dispersion and obtain a maximum of criteria per cluster (i.e., priorities by strategic guideline). This is a well-established procedure for group consensus that encourages contributions from everyone and facilitates quick agreement on the relative importance of issues, problems or solutions. The final list arising from the multi-voting application is shown in Table 1.

Table 1. Most influential criteria/strategic priorities according to decision panel (source: Banco de Portugal, 2021)

Clusters/Strategic guidelines	Criteria/Strategic priorities
C1/SG1 Financial system robustness	1.1. To contribute to a discussion on the strategy, the long-term framework and the implementation of the Eurosystem's monetary policy.
	1.2. To assess the implications for the Eurosystem of issuing a central bank digital currency and to engage in designing and implementing it.
	1.3. To re-examine and develop internal methodologies to assess new risks with repercussions on financial stability and monetary policy.
	1.4. To monitor the implications of climate change and energy transition for monetary policy and financial stability.
	1.5. To influence regulatory developments in the financial system, notably the macro- and micro-prudential, conduct and resolution aspects as well as the Banking Union's architecture.
C2/SG2 Protection of the Banking market	2.2. To promote adequate governance, conduct and internal control of supervised institutions.
	2.3. To monitor developments and the sustainability of institutions' business models, focusing on digital transformation, operational resilience and environmental risk management.
	2.5. To bolster the supervisory effectiveness of entities operating with virtual assets.
	2.6. To promote the general public's accessibility to the various payment solutions available, making the retail payments market in Portugal more secure, efficient and innovative.
	2.7. To assess and bolster the quality of reporting by institutions and strengthen internal information on bank accounts and payments.
	2.10. To develop mechanisms to accelerate proceedings in the discharge of the enforcement function.
	2.11. To streamline a medium/long-term digital financial literacy strategy for Portugal, promoting financial inclusion via proper, secure use of digital channels to access retail banking product.

End of Table 1

Clusters/Strategic guidelines	Criteria/Strategic priorities
C_3/SG_3 Recovery and resilience of the economy	3.2. To invest in data compilation and production to support the analyses and studies required for advising on economic agents' behavior.
	3.3. To promote and support projects in the field of data science.
	3.4. To deepen cooperation with other Portuguese statistical authorities.
	3.5. To foster dialogue with relevant economic sectors on statistical production and economic analyses published.
C_4/SG_4 Confidence and Influence on Society	4.1. To foster economic literacy by explaining the bank's activities and tasks, focusing on its role within the European framework, creating confidence and understanding of its mission.
	4.2. To regularly interact with firms and society as a whole, bringing the Bank closer to the community.
	4.3. To enhance social responsibility and sustainability in terms of environmental, social and corporate governance parameters (ESG).
C5/SG5 Governance and internal management	5.1. To maximize the further advancement of its staff by providing the organization and its people with the necessary skills and competences, thereby diversifying development opportunities and promoting mobility.
	5.3. To consolidate the integrated information management project, while advancing on information governance models and data architecture.
	5.4. To reinforce the Bank's technological and digital capacity: to identify opportunities for automation by rolling out projects with the various business areas.
	5.5. To establish the innovation management model associated with the digital transformation process.
	5.6. To advance the project to concentrate the Bank's services dispersed across Lisbon in a new building.
	5.9. To diversify assets under management, taking into account profitability and risk vectors.
	5.10. To set an adequate balance sheet financial buffer level.

Once the streamlining exercise was completed, the DEMATEL technique could be applied to assess the cause-and-effect relationships between the 26 strategic priorities of the SP21-25 (Table 1). Six support matrices were built with the decision panel (i.e., one on the five strategic guidelines – clusters – and one for each of the five clusters). For the matrices' completion, the panel was asked to perform the causation analyses of each matrix, punctuating the relationships based on the traditional DEMATEL scale, where 0 – no influence and 4 – very high influence, with decimal values being allowed. All the data used in our study were directly provided and approved by the panel members after intense collective discussion and negotiation. Tables 1 to 8 show the results obtained, in line with the first step described in Section 2.2.1.

3.1.1. Step 1: Calculate initial direct influence matrix *Z*

The first matrix reflects the inter-cluster influence, meaning the influence that the strategic guidelines have on each other (see Table 2).

Table 2. Direct influence matrix for inter-cluster relationships (inter-strategic guidelines)

	SG1	SG2	SG3	SG4	SG5	**Total**
SG1	0.0000	4.0000	3.0000	4.0000	1.0000	**12.0000**
SG2	3.0000	0.0000	2.5000	3.0000	1.0000	**9.5000**
SG3	4.0000	2.5000	0.0000	3.0000	1.0000	**10.5000**
SG4	3.0000	3.0000	2.0000	0.0000	2.5000	**10.5000**
SG5	3.0000	4.0000	3.0000	4.0000	0.0000	**14.0000**
Total	**13.0000**	**13.5000**	**10.5000**	**14.0000**	**5.5000**	

Table 2 shows that the influences of the first three strategic guidelines (i.e., SG1, SG2 and SG3) on SG5 is 1.0000 (i.e., low influence). With a very high influence relationship, for example, SG1 is identified on SG2 and SG4, SG3 on SG1, as well as SG5 on SG2 and SG4. Overall, SG4 is more influenced and SG5 is the least influenced. The latter – SG5 – is also the one with the greatest influence over the others.

The same exercise of direct influence assessment was carried out within each cluster (i.e., intra-*each strategic guideline*). The results for SG1 are shown in Table 3, namely the effects of criteria/priorities 1.1, 1.2, 1.3, 1.4 and 1.5 on each other.

Table 3. Direct influence matrix for SG1 – Financial system robustness

	1.1	1.2	1.3	1.4	1.5	**Total**
1.1	0.0000	2.5000	2.5000	3.0000	1.5000	**9.5000**
1.2	3.0000	0.0000	2.5000	1.5000	1.5000	**8.5000**
1.3	2.5000	1.5000	0.0000	3.5000	3.0000	**10.5000**
1.4	3.5000	1.5000	3.5000	0.0000	4.0000	**12.5000**
1.5	3.0000	1.5000	2.5000	3.0000	0.0000	**10.0000**
Total	**12.0000**	**7.0000**	**11.0000**	**11.0000**	**10.0000**	

The results presented in Table 3 show only one very high influence relationship (i.e., 1.4 on 1.5) and that, overall, 1.2 is the priority that presents less relative influence in both directions.

The third matrix is shown in Table 4. It concerns the relationship of influence between the seven priorities of the second cluster – SG2 (i.e., 2.2, 2.3, 2.5, 2.6, 2.7, 2.10 and 2.11).

Table 4. Direct influence matrix for SG2 – Protection of the banking market

	2.2	2.3	2.5	2.6	2.7	2.10	2.11	**Total**
2.2	0.0000	4.0000	3.5000	2.5000	3.0000	1.0000	1.0000	**15.0000**
2.3	2.0000	0.0000	3.0000	3.0000	3.0000	1.0000	2.0000	**14.0000**
2.5	3.0000	1.5000	0.0000	1.5000	1.5000	2.0000	2.0000	**11.5000**
2.6	1.0000	2.0000	1.0000	0.0000	1.0000	1.0000	2.5000	**8.5000**
2.7	3.0000	2.0000	3.5000	1.0000	0.0000	2.0000	2.5000	**14.0000**
2.10	3.0000	2.5000	3.0000	1.0000	3.0000	0.0000	1.0000	**13.5000**
2.11	1.0000	2.0000	2.5000	4.0000	1.0000	1.0000	0.0000	**11.5000**
Total	**13.0000**	**14.0000**	**16.5000**	**13.0000**	**12.5000**	**8.0000**	**11.0000**	

Table 4 shows 13 relationships of low influence (1.0000), four of which were from 2.6 on 2.2, 2.5, 2.7 and 2.10. The sum of the influence values highlights 2.10 as the one least influenced by the others, although it has a high influence on 2.2, 2.5 and 2.7. The highest rated influence ratio in this cluster (4.0000) are 2.2 over 2.3. and 2.11 over 2.6.

The matrix represented in Table 5 concerns SG3 under the angle of influence of four priorities (i.e., 3.2, 3.3, 3.4 and 3.5).

Table 5. Direct influence matrix for SG3 – Recovery and resilience of the economy

	3.2	3.3	3.4	3.5	**Total**
3.2	0.0000	3.5000	3.5000	3.5000	**10.5000**
3.3	3.5000	0.0000	2.0000	3.0000	**8.5000**
3.4	3.5000	1.0000	0.0000	2.5000	**7.0000**
3.5	3.5000	1.5000	3.0000	0.0000	**8.0000**
Total	**10.5000**	**6.0000**	**8.5000**	**9.0000**	

Table 5 highlights the high influences for 3.2, which presents six relationships scored at 3.5000 (i.e., a midpoint between high and very high influence). This means that priority 3.2 is mutually influential and influenced. By the sum of the values of influence, 3.3 is the least influenced, especially due to the influence from 3.4 (1.0000).

The results for SG4 are shown in Table 6. This cluster is smaller and its three criteria/priorities – 4.1, 4.2 and 4.3 – are according the original SP21-25 structure (i.e., were not subject to multi-voting):

Table 6. Direct influence matrix for SG4 – Confidence and influence on society

	4.1	4.2	4.3	**Total**
4.1	0.0000	4.0000	2.0000	**6.0000**
4.2	4.0000	0.0000	2.0000	**6.0000**
4.3	2.0000	2.0000	0.0000	**4.0000**
Total	**6.0000**	**6.0000**	**4.0000**	

Table 6 provides information on relationships of symmetrical interdependence between the priorities, and the strong (4.0000) and reciprocal relationships of 4.1 and 4.2. while the relations of influence of 4.3 is medium (2.0000).

The last direct influence matrix refers to SG5, which was a cluster of ten, before multi-voting application. The results for the seven priorities identified (i.e., 5.1, 5.3, 5.4, 5.5, 5.6, 5.9 and 5.10) are presented in Table 7.

As shown in Table 7, there are 24 influence relationships scored with 1.0000 (i.e., low influence), with some highlights: 5.6 is the least influenced, as verified by the sum of the total column values; and 5.9 and 5.10 have a relatively low influence with the others, but the interdependence between them is high (3.0000) and reciprocal.

Table 7. Direct influence matrix for SG5 – Governance and internal management

	5.1	5.3	5.4	5.5	5.6	5.9	5.10	**Total**
5.1	0.0000	2.0000	2.5000	2.0000	1.5000	1.0000	1.0000	**10.0000**
5.3	3.5000	0.0000	3.0000	1.0000	1.0000	1.0000	1.0000	**10.5000**
5.4	2.5000	4.0000	0.0000	1.5000	1.0000	1.0000	1.0000	**11.0000**
5.5	3.0000	1.5000	3.5000	0.0000	1.0000	1.0000	1.0000	**11.0000**
5.6	4.0000	2.0000	3.0000	1.0000	0.0000	1.0000	1.0000	**12.0000**
5.9	1.0000	2.0000	1.0000	1.0000	1.0000	0.0000	3.0000	**9.0000**
5.10	1.0000	1.0000	1.0000	1.0000	1.0000	3.0000	0.0000	**8.0000**
Total	**15.0000**	**12.5000**	**14.0000**	**7.5000**	**6.5000**	**8.0000**	**8.0000**	

After this first step was completed, the remaining DEMATEL steps depart from the scores of the six matrices of direct influence, until reaching the final matrices T and designing the diagrams of cause-effect relationships. The following step determines the normalized direct influence matrix X for inter-clusters relationships.

3.1.2. Step 2: Determine normalized direct matrix *X*

The inter-cluster (i.e., strategic guidelines) normalized direct influence matrix *X* arises from the multiplication of the inter-cluster direct influence matrix *Z* by the coefficient 1/s, where *s* is the maximum of the total values in line or column of direct influence matrix *Z*. Being the maximum = 14 (see Table 2), 1/s = 0.0714, the results of its multiplication are presented in Table 8.

Table 8. Normalized direct influence matrix *X* for inter-cluster/strategic guidelines

	SG1	SG2	SG3	SG4	SG5
SG1	0.0000	0.2857	0.2143	0.2857	0.0714
SG2	0.2143	0.0000	0.1786	0.2143	0.0714
SG3	0.2857	0.1786	0.0000	0.2143	0.0714
SG4	0.2143	0.2143	0.1429	0.0000	0.1786
SG5	0.2143	0.2857	0.2143	0.2857	0.0000

The next step builds the total influence matrix *T*. The totals per row and column (*R* and *C* vectors, respectively) will originate the axes of the DEMATEL diagram.

3.1.3. Step 3: Build the total influence matrix *T*

The building of the total influence matrix *T* starts with the identity matrix *I* (see Table 9). Then matrix (*I* – *X*) (see Table 10) results from the difference of matrix *I* and the normalized direct influence matrix *X* (see Table 8).

Table 9. Identity matrix I for inter-cluster/strategic guidelines

	SG1	SG2	SG3	SG4	SG5
SG1	1.0000	0.0000	0.0000	0.0000	0.0000
SG2	0.0000	1.0000	0.0000	0.0000	0.0000
SG3	0.0000	0.0000	1.0000	0.0000	0.0000
SG4	0.0000	0.0000	0.0000	1.0000	0.0000
SG5	0.0000	0.0000	0.0000	0.0000	1.0000

Table 10. Matrix $(I - X)$ for inter-cluster relationships

	SG1	SG2	SG3	SG4	SG5
SG1	1.0000	–0.2857	–0.2143	–0.2857	–0.0714
SG2	–0.2143	1.0000	–0.1786	–0.2143	–0.0714
SG3	–0.2857	–0.1786	1.0000	–0.2143	–0.0714
SG4	–0.2143	–0.2143	–0.1429	1.0000	–0.1786
SG5	–0.2143	–0.2857	–0.2143	–0.2857	1.0000

The total influence matrix T is constructed from the inverse matrix $(I - X)^{-1}$ (see Table 11) and the inter-cluster results from the computation of all direct and indirect effects of the strategic guidelines are presented in the total influence matrix T (see Table 12).

Table 11. Matrix $(I - X)^{-1}$ for inter-cluster/strategic guidelines

	SG1	SG2	SG3	SG4	SG5
SG1	1.7324	0.9672	0.7765	0.9901	0.4251
SG2	0.7863	1.6199	0.6523	0.8156	0.3641
SG3	0.8913	0.8301	1.5478	0.8756	0.3899
SG4	0.8510	0.8687	0.6844	1.7124	0.4775
SG5	1.0300	1.0962	0.8800	1.1221	1.4151

Table 12. Total influence matrix T for inter-cluster relationships

	SG1	SG2	SG3	SG4	SG5
SG1	0.7324	0.9672	0.7765	0.9901	0.4251
SG2	0.7863	0.6199	0.6523	0.8156	0.3641
SG3	0.8913	0.8301	0.5478	0.8756	0.3899
SG4	0.8510	0.8687	0.6844	0.7124	0.4775
SG5	1.0300	1.0962	0.8800	1.1221	0.4151

For the application of step 4, the total influence matrix T displays the values higher than the threshold α (i.e., 0.7521) gray shaded. The threshold α corresponds to the average value of the T matrix. Therefore, the gray shaded values are the effects with greater relevance between inter-clusters.

3.1.4. Step 4: Generate the Influential Relation Map (IRM)

The IRM axes are calculated from the total influence matrix *T* (see Table 12), namely by the sum of the rows and columns that correspond to the *R* and *C* vectors, respectively. For the structure of the diagram (see Table 13), the horizontal axis is given by the expression (R + C) and the vertical axis is given by the expression (R – C).

Table 13. Axes pairs (R + C) and (R – C) for inter-cluster relationships

	R	C	**R + C**	**R – C**
SG1	3.8912	4.2909	**8.1821**	**–0.3997**
SG2	3.2383	4.3821	**7.6204**	**–1.1439**
SG3	3.5347	3.5410	**7.0757**	**–0.0063**
SG4	3.5940	4.5157	**8.1097**	**–0.9217**
SG5	4.5433	2.0717	**6.6150**	**2.4717**

3.1.5. Step 5: Design cause-effect relationship map

The DEMATEL diagram for inter-cluster analysis considers the axes pairs from step 4 and is filled by the values marked in gray in the Total influence matrix *T* (Table 12). The upshot is the inter-cluster relationships map in Figure 3.

The horizontal axis (R + C) presents the five clusters/SG in terms of importance. In turn, the vertical axis (R – C) divides the clusters into two groups (i.e., one of causes and the other of effects). Above the line, there is the group of causes (i.e., (R – C) is positive), where are the clusters that exert direct influence on others. Below the line, there is the effects' group (i.e., (R – C) is negative), where the clusters are influenced.

The further analysis of this DEMATEL inter-cluster relationship diagram, as well as the findings for the priorities on each of the five clusters, based on the direct influence matrices defined in the working group section (Tables 2 to 7) are presented in the next subsection.

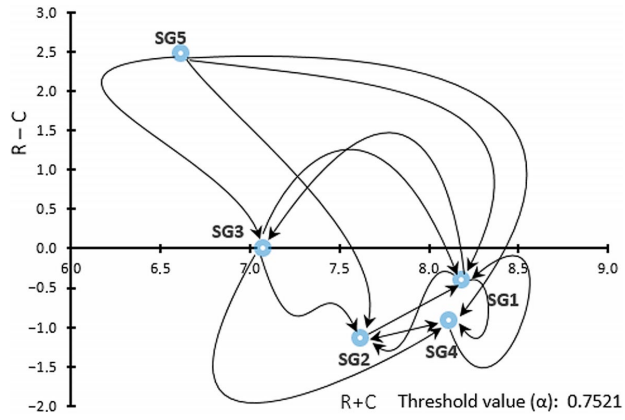

Figure 3. DEMATEL inter-cluster relationship diagram

3.2. Main results

The DEMATEL inter-cluster relationship map in Figure 3 shows that SG1 is the most important SG with the highest value (i.e., 8.1821). In reverse, SG5 shows the lowest value of this axis (i.e., 6.6150). The complete sort, in descending order of importance is SG1, SG4, SG2, SG3 and SG5. Regarding the influential relationship, SG5 influences the others. That is, SG1, SG2, SG3 and SG4 are influenced by SG5, although SG3 is very close to the axis (i.e., –0.0063). SG5 does not receive any influence from the others. The demonstration and analysis of the priorities on each of the five clusters follow the order of the clusters (i.e., the strategic guidelines), namely: SG1 – Financial system robustness, with five criteria/priorities; SG2 – Protection of the Banking Market, with seven criteria; SG3 – Recovery and Resilience of the Economy, with four criteria; SG4 – Trust and Influence in Society; and SG5 – Governance and Internal Organization, with seven criteria. The gray shaded values in *T* matrices embody the values above the average of each array. The results obtained within cluster 1 (i.e., intra strategic guideline SG1) are exposed in Table 14 and Figure 4.

Table 14. Total influence matrix *T* with vectors R&C for SG1 – *Financial system robustness*

	1.1	1.2	1.3	1.4	1.5	**R**
1.1	0.8538	0.7114	0.9679	1.0084	0.8628	**4.4043**
1.2	0.9529	0.4891	0.8775	0.8384	0.7719	**3.9298**
1.3	1.1092	0.7068	0.8846	1.1260	1.0305	**4.8570**
1.4	1.2932	0.7938	1.2269	1.0363	1.1965	**5.5468**
1.5	1.0915	0.6813	1.0090	1.0565	0.7930	**4.6313**
C	**5.3005**	**3.3825**	**4.9659**	**5.0656**	**4.6548**	

Figure 4 reveals that priority 1.4 holds the highest importance within the SG1 cluster, with a value of (R + C) = 10.6124. Conversely, priority 1.2, with a value of (R + C) = 7.3123, has the lowest prominence within the SG1 cluster. The result of prioritizing this first cluster of SP21-25 is as follows: 1.4, 1.3, 1.1, 1.5 and 1.2. Above the line on the vertical axis (R – C),

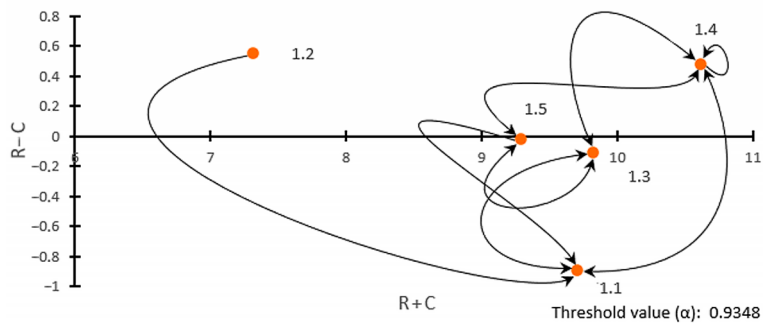

Figure 4. DEMATEL relationship diagram for SG1 – Financial system robustness

there is the group of causes, which contains 1.4 and 1.2, considered as influencers of the others that appear in the effects group (i.e., 1.1, 1.3 and 1.5 are influenced). Combining the prominence and relationship dimensions for the first cluster of the SP21-25, the DEMATEL diagram returns the following assessment: (Q1) Central Factors – 1.4; (Q2) Determinant factors – 1.2; and (Q4) Impact factors – 1.1, 1.3 and 1.5. The next cluster refers to SG2 *Protection of the Banking market*, which results are exposed in Table 15 and Figure 5.

Table 15. Total influence matrix *T* with vectors R&C for SG2 – *Protection of the banking market*

	2.2	2.3	2.5	2.6	2.7	2.10	2.11	**R**
2.2	0.4345	0.6548	0.7074	0.5635	0.5675	0.3422	0.4442	**3.7141**
2.3	0.5027	0.4152	0.6372	0.5547	0.5263	0.3189	0.4624	**3.4174**
2.5	0.4997	0.4522	0.4237	0.4308	0.4134	0.3311	0.4056	**2.9565**
2.6	0.3029	0.3719	0.3648	0.2643	0.2940	0.2190	0.3570	**2.1740**
2.7	0.5710	0.5436	0.6868	0.4737	0.3922	0.3779	0.4894	**3.5345**
2.10	0.5722	0.5636	0.6617	0.4597	0.5502	0.2686	0.4131	**3.4891**
2.11	0.3663	0.4370	0.5060	0.5297	0.3498	0.2624	0.2857	**2.7370**
C	**3.2493**	**3.4384**	**3.9875**	**3.2765**	**3.0933**	**2.1202**	**2.8573**	

The results for SG2 shows priorities 2.2, 2.5, 2.3 and 2.7 as the relatively most prominent in this cluster (i.e., with values of (R + C) above average). The remainder, in descending order of importance, are 2.11, 2.10 and 2.6. Furthermore, 2.10, 2.2 and 2.7 constitute the group of causes (with (R – C) positive), and the remaining four, in the effects group, are influenced. In terms of quadrants of the DEMATEL diagram, there is the following distribution: (Q1) Central factors – 2.2 and 2.7; (Q2) Determinant factors – 2.10; (Q3) Independent factors – 2.11 and 2.6; and (Q4) Impact factors – 2.3 and 2.5 (see Figure 5). The third cluster of SP21-25 refers to SG3 – *Recovery and resilience of the economy* and its results are presented in Table 16 and Figure 6.

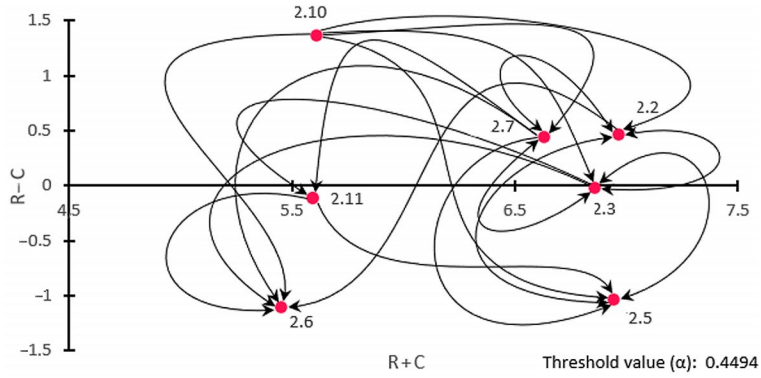

Figure 5. DEMATEL relationships diagram for SG2 – Protection of the banking market

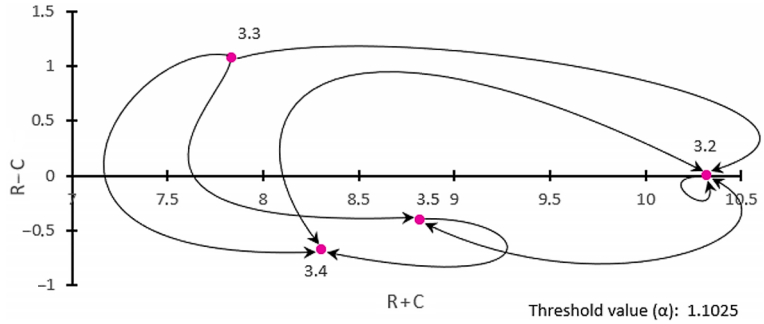

Figure 6. DEMATEL relationships diagram for SG3 – Recovery and resilience of the economy

Table 16. Total influence matrix *T* with vectors R&C for SG3 – *Recovery and resilience of the economy*

	3.2	3.3	3.4	3.5	**R**
3.2	1.2900	1.0944	1.3726	1.4028	**5.1598**
3.3	1.3645	0.7374	1.1348	1.2214	**4.4581**
3.4	1.2033	0.7256	0.8382	1.0461	**3.8131**
3.5	1.3020	0.8203	1.1448	0.9410	**4.2082**
C	**5.1598**	**3.3778**	**4.4904**	**4.6113**	

The DEMATEL diagram for SG3 shows that priority 3.2 is the most prominent, with (R + C) = 10.3196, followed by 3.5 with (R + C) = 8.8195, marginally above the midpoint. Regarding cause-effect relationships, only priority 3.3 influences the remaining three (i.e., (R − C) positive). Priority 3.2, with a (R − C) = 0, is in a position that does not influence or is influenced. Thus, the distribution is: (Q.2) Determinant factors – 3.3; (Q.3) Independent factors – 3.4; and (Q.4) Impact factors – 3.5. The fourth cluster of SP21-25 refers to SG4 – Confidence and influence on society which outcome is presented in Table 17 and Figure 7.

Table 17. Total influence matrix *T* with vectors R&C for SG4 – *Confidence and influence on society*

	4.1	4.2	4.3	**R**
4.1	3.8000	4.2000	3.0000	**11.0000**
4.2	4.2000	3.8000	3.0000	**11.0000**
4.3	3.0000	3.0000	2.0000	**8.0000**
C	**11.0000**	**11.0000**	**8.0000**	

Figure 7 reflects a symmetric total influence matrix, which means that the interdependence relationships between priorities 4.1, 4.2, and 4.3 are nil (i.e., (R − C) = 0). In this context, it is only possible to organize the SG4's priorities in descending order of importance: 4.1 and 4.2 with the same value (R + C) = 22, while 4.3, with (R + C) =16, is the less important in this cluster. The fifth and last cluster of SP21-25 refers to SG5 – Governance and internal management. The upshots are presented in Table 18 and Figure 8.

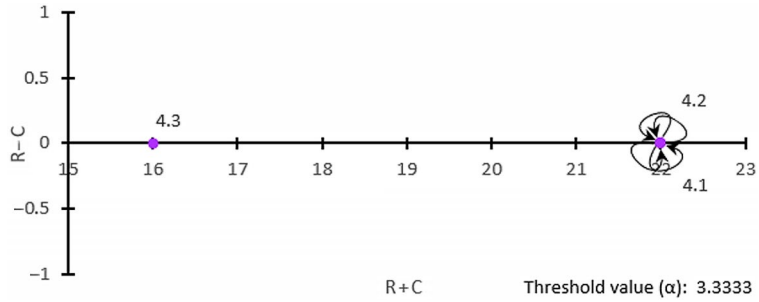

Figure 7. DEMATEL relationships diagram for SG4 – Confidence and influence on society

Table 18. Total influence matrix *T* with vectors R&C for SG5 – *Governance and internal management*

	5.1	5.3	5.4	5.5	5.6	5.9	5.10	**R**
5.1	0.3200	0.4010	0.4462	0.2932	0.2380	0.2249	0.2249	**2.1483**
5.3	0.5210	0.2971	0.4786	0.2490	0.2178	0.2303	0.2303	**2.2242**
5.4	0.4908	0.5248	0.3282	0.2797	0.2229	0.2372	0.2372	**2.3209**
5.5	0.5114	0.4040	0.5212	0.1939	0.2241	0.2379	0.2379	**2.3303**
5.6	0.5948	0.4532	0.5225	0.2738	0.1763	0.2517	0.2517	**2.5241**
5.9	0.3227	0.3468	0.3080	0.2081	0.1884	0.1562	0.3228	**1.8529**
5.10	0.2937	0.2747	0.2814	0.1943	0.1763	0.3100	0.1434	**1.6738**
C	**3.0546**	**2.7016**	**2.8861**	**1.6920**	**1.4439**	**1.6482**	**1.6482**	

Figure 8 reveals the relative importance of priorities 5.4, 5.1 and 5.3, with (R + C) of 5.2069, 5.2028 and 4.9257, respectively. At the other end, priorities 5.10 and 5.9 are the less relevant within SG5. The complete ordering, in a descendent way, is as follows: 5.4, 5.1, 5.3, 5.5, 5.6, 5.9 and 5.10. Additionally, priorities 5.5, 5.6, 5.9 and 5.10 constitute a group of causes and the remaining three are in the effects group (i.e., are influenced). This means that only two quadrants of the DEMATEL diagram are filled in, namely: (Q.2) determinant factors – 5.5, 5.6, 5.9 and 5.10 (low prominence and high ratio); and (Q.4) impact factors - 5.4, 5.1 and 5.3 (high prominence and low ratio).

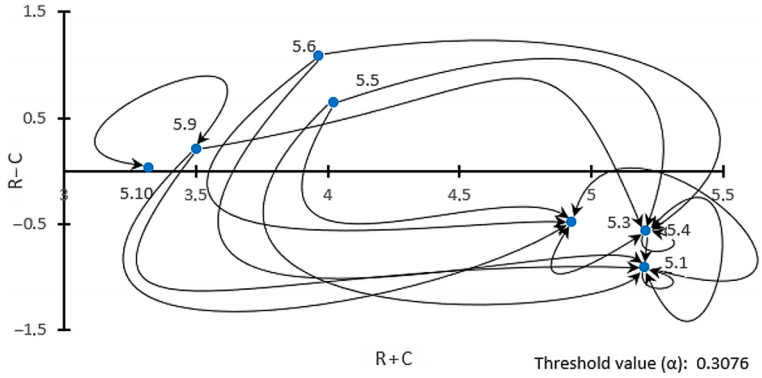

Figure 8. DEMATEL relationships diagram for SG5 – Governance and internal management

The development and analysis of the DEMATEL diagrams (Figures 3 to 8) accomplish the evaluation phase of the object of the study. The next subsection develops a set of recommendations based on the collation of the main results, also considering the findings discussed on a consolidation session with the Governor and the Head of Governors' office.

3.3. Consolidation, discussion, and recommendations

The multicriteria analysis developed through the application of the DEMATEL technique and consequent analysis of the inter- and intra-*cluster* results allowed for the formulation of a hierarchy of the strategic priorities based on the (R + C) axes of the total influence *T* matrices. Overall, the application of the *cluster-to-cluster* DEMATEL technique identifies three priorities as central factors (i.e., Q1 of the IRM diagram), namely: 1.4; 2.2 and 2.7. Furthermore, the application of the DEMATEL technique allows to present, with empirical evidence, the following hierarchical list of the 26 strategic priorities of the SP21-25 (see Table 19).

Table 19. List of SP21-25 Strategic Priorities Ordered by Results in Total Influence Matrix *T* (R + C)

#	(R+C)	Criteria / Priority	IRMQ1
4.1	22.0000	4.1.	CF
4.2	22.0000	4.2.	CF
4.3	16.0000	4.3.	
1.4	10.6124	1.4.	CF
3.2	10.3196	3.2.	CF
1.3	9.8230	1.3.	
1.1	9.7048	1.1.	
1.5	9.2860	1.5.	
3.5	8.8195	3.5.	
3.4	8.3035	3.4.	
3.3	7.8359	3.3.	
1.2	7.3123	1.2.	
2.2	6.9634	2.2.	CF
2.5	6.9441	2.5.	
2.3	6.8557	2.3.	
2.7	6.6278	2.7.	CF
2.10	5.6093	2.10.	
2.11	5.5943	2.11.	
2.6	5.4505	2.6.	
5.4	5.2070	5.4.	
5.1	5.2028	5.1.	
5.3	4.9258	5.3.	
5.5	4.0223	5.5.	
5.6	3.9679	5.6.	
5.9	3.5011	5.9.	
5.10	3.3219	5.10.	

Note: * CF – Central factor.

Table 19 provides the empirical results from a DEMATEL application to the priorities of SP21-25. This list can support the following set of recommendations: (1) the three most prominent priorities are all the priorities of the fourth SG – Trust and Influence in Society. Moreover, this SG corroborates the motto of the SP21-25: *Promoting proximity and strengthening trust*; (2) the first nine positions in Table 19 have the vector (R + C) higher than the average (i.e., 8.3158), these being the top-9 (most important/priorities); and (3) priorities with lower results are influenced by the top priorities within each cluster. All in all, the general recommendation goes toward valuing the results of the application of the DEMATEL technique translated into the hierarchy presented in Table 19. However, these results should constitute insights and may require further investigation.

To substantiate the outcome of the methodology and the recommendations, a consolidation session was held with the Governor of Banco de Portugal, accompanied by the Head of the Governor's Office. Their overall appreciation was in the sense of valuing the study and appraise the methodology applied with reference to the main results presented. The results obtained – with reference to the hierarchical list of strategic priorities in Table 19 – are aligned with their convictions. Overall, the opinions expressed go toward the valorization of the exercise and the application of the DEMATEL technique. In general terms, constructive assent constitutes a potential applicability of the DEMATEL technique, as indicative in the hierarchization of the priorities of the Banco's strategic plan (e.g., in the context of the mid-term review expected in SP21-25). In addition, the iterative construction of the influences by the panel of decision-makers gives an interesting dynamic, although there is the possibility of configuring improvements or applying variants.

Conclusions and future research

This study was developed with a view to delivering a set of recommendations in the hierarchization of the priorities of the Banco de Portugal's strategic plan. It specifically addressed the causation dynamics between the five guidelines and the strategic priorities of the SP21-25 with DEMATEL technique.

The key results, with reference to the Figure 3 (i.e., DEMATEL inter-cluster relationship diagram) and to the Table 19 (i.e., list of strategic priorities of the SP21-25 ordered by the results in the total influence matrices T (R + C)) constitute useful insights. First, according to the DEMATEL inter-cluster relationship diagram, SG5 – which addresses the internal dimension of the organization (i.e., governance and management) – is the least prominent. However, SG5 is an influencer of the others (i.e., the only strategic guideline that exerts influence over all others and is not influenced by any). SG5 is in the IRM quadrant of the determinant factors, which corresponds to the group of "cause of perceived risks". Second, combining the relative importance ranking of the DEMATEL inter-cluster diagram with the hierarchical list of strategic priorities, there is consistency in the identification of the most prominent strategic guidelines (i.e., SG1 and SG4, which project, respectively, the robustness of the financial system (macro dimension in the post-pandemic period) and the confidence and influence on society (the latter fully aligned with the motto of PE21-25 – proximity and trust – and whose three priorities constitute the top-3 of the hierarchical list)). Finally, the

positioning of all SG5 priorities at the bottom of the hierarchical list of strategic priorities (i.e., priorities with lower results) is prejudiced by the fact that the SG5 cluster contains priorities of a very differentiated nature and, therefore, causation relationships are low. This can give room to a revision of the cluster structure. This situation is particularly evident for priorities 5.9 and 5.10, whose interdependence is broad and reciprocal, but low in and to the other priorities of the SP5.

Given the limitation of the existing research on central banks' strategic plans, this study contribution to the literature is two-fold. First, it applies a constructivist and collaborative approach to attain a set of specific medium-term strategic priorities, and the results achieved are valued and respond to the main objective of the work carried out. Second, it experiments the MCDA approach, using the DEMATEL technique, which can contribute to improving the decision-making process in the specific case on the strategic priorities of the SP21-25 (i.e., a very interesting holistic view, through easy-to-interpret diagrams).

The limitations of the study are also opportunities to rehearse variants on the following considerations: (1) the results obtained depend on the composition of the panel of decision-makers and on the dynamics of the iterative construction of influences (in which all members have the same weight); and (2) the impacts related with a less uniform structuring of the decision-making process are only demonstrated by the analysis of the results. In this regard, it should be highlighted that the intent of this study is to provide a methodological framework, where its application may result in different findings when applied in different contexts. Due to the process-oriented nature of the methodology, results generally are not applicable from one bank to another and, in some respects, the actual results may not be as critical as the process. As Bell and Morse (2013, p. 962) note, *"there is less emphasis on outputs per se and more focus on process*". This not only supports the process-oriented nature of our study, but also increases its constructivist epistemological orientation.

The possibility of testing variants on the pointed-out limitations embodied the practical contributions and suggestions for future work. Future research dealing with central banks' strategic priorities formulation can corroborate or extend the findings of this study, using complementary methodological approaches. The purpose is the development of a robust and coherent model based on multicriteria techniques to support decision-making for the formulation of strategic plans of Banco de Portugal.

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