

## A Narrative Review for Revisiting BCG Matrix Application in Performance Evaluation of Public Sector Entities

|                        |                                                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Muhammad Zaurez Afshar | Faculty of Business & Accountancy, Lincoln University College, Malaysia,<br><a href="mailto:mzafshar@lincoln.edu.my">mzafshar@lincoln.edu.my</a> |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|

|                          |                                                                         |
|--------------------------|-------------------------------------------------------------------------|
| Dr. Mutahir Hussain Shah | Faculty of Business & Accountancy, Lincoln University College, Malaysia |
|--------------------------|-------------------------------------------------------------------------|

**Abstract:** ***Purpose:** This study reviews the BCG Matrix for performance evaluation and approach of public sector entities in developing countries. The study is part of the doctoral thesis for performance evaluation of a Pakistani public sector organization under environmental factors. **Approach:** A systematic review of the literature has been used here to describe the BCG Matrix applications in the public sector, mainly in developing economies with scarce resources. **Results:** The review indicates that while the BCG Matrix is common in private firms, it is not yet popularly applied in the public sector. Still, information suggests that it can be a straightforward yet practical tool to assess an institution's health, allocate budgets where needed, and identify issues within state-run organizations. **Limitations:** The review is restricted since few studies have used the BCG Matrix to analyze public sector organizations in developing economies. **Practical Implications:** The results from the review guide policymakers and administrators on how to use the BCG Matrix for strategic management and achieving more for the public. Among the first of its kind, this review shows how the BCG Matrix is useful for measuring performance in the public sector of developing countries.*

**Keywords:** BCG Matrix, Public Sector Entity, Developing Economies, Strategic Evaluation, State-Owned Enterprises (SOEs)

### Introduction

Monitoring and measuring how public organizations operate plays a key part in changing things for the better in developing economies, since governments have to do more with less and ensure they are accountable (Chiu & Lin, 2019). Although scholars have discussed strategic management methods in public administration at a global level, using business-originated tools like the BCG Matrix within public organizations is rare and not well explained (Gray, 2021; Schmidt et al., 2025).

Back in the 1970s, Bruce Henderson designed the BCG Matrix as a portfolio management method for private firms to properly use their resources by considering market growth and market share across their different business units (Hambrick et al., 1982; Musayeva, 2023). The matrix is used to divide businesses into Stars, Cash Cows, Question Marks, and Dogs to decide whether a firm should invest, keep, or sell a particular business unit. Even though Balanced Scorecard is widely recognized in companies, its impact on public sector evaluations in developing countries is still being tested (Manyaeva & Karapetyan, 2023; X. Yang et al., 2023).

Developing countries' public sector organizations usually find it challenging to achieve strategic alignment due to being considered inefficient, having roles that overlap, and being strongly affected by politics. On the other hand, these organizations often carry out tasks in areas such as health, education, agriculture, energy, and infrastructure where their performance should be measured by how costly their

services are, how well they perform, and if they remain sustainable (García-Vidal et al., 2023; Gray, 2021). Here, strategic tools such as the BCG Matrix might be used to group PSEs according to how much value they give to the public and if their finances are stable.

This literature review seeks to look into existing research and practical approaches that use the BCG Matrix to assess the performance of public entities in developing countries (Park, 2025). In particular, the research focuses on how the framework has been modified and used in real-life cases other than companies, and if it could be a useful tool for policy makers (Zaffran et al., 2025).

The importance of this review is that it may develop a simpler yet practical model for evaluating performance that fits the specific conditions in developing countries. Examining and analyzing current works, this paper enriches discussions on strategic public management and gives a base for future empirical and policy-related studies (L. Yang et al., 2025).

Following this section, Section 2 will give details on the narrative review methodology, Section 3 will cover the theories behind the BCG Matrix, Section 4 will feature overarching themes from the literature, Section 5 will suggest applying the BCG Matrix in the public sector, Section 6 will highlight policy suggestions, and Section 7 will detail directions for additional research.

## **2. Methodology**

The study relies on a literature review to gather and carefully assess articles about applying the BCG Matrix as a framework for measuring performance in the public and developing sectors. Narrative reviews are more appropriate than systematic reviews for exploratory topics because the literature for them is often incomplete, covers several fields, or is fast changing (Amat & Wang, 2025). The narrative method lets researchers explore a variety of interpretations, add useful contexts, and rely on theories, which fits the BCG Matrix since its use in the public sector is evolving, not fully developed.

### **2.1 Research Questions**

These research questions are what lead this study:

1. How many cases are there of the BCG Matrix being put to use or adjusted for assessing performance in the public sector?
2. What problems do the BCG Matrix and its approach face when they are implemented in developing countries' public sector entities?
3. Can the BCG Matrix be modified to fit the public sector's needs for performance evaluation, especially in cases of limited resources?

### **2.2 Literature Search Strategy**

An extensive search for literature was done between 1990 and 2025 on main academic databases such as:

- **Scopus**
- **Web of Science**
- **JSTOR**
- **Google Scholar**
- **ScienceDirect**

Keywords as well as Boolean operators were included in the approach.

With the terms “BCG Matrix” OR “Boston Consulting Group Matrix,” and including “public sector,” “government entities,” or “state-owned enterprises,” then “developing economies” or “developing countries” as well as “performance evaluation” or “strategic management.”

Only articles published in English between 1990 and 2025 were included to find important classics and

recent developments. Grey literature like reports, briefs, and studies from public institutions was examined to find uses of the BCG Matrix in any public planning settings.

### 2.3 Inclusion and Exclusion Criteria

#### Inclusion Criteria:

- Research papers, peer-reviewed articles, and books that help explain how tools for evaluating performance are used in public sectors.
- Research that relates to or mentions the BCG Matrix.
- Works that describe using business tools in the public sector of developing countries.

#### Exclusion Criteria:

- Literature that limits itself to cases about the private sector.
- Research done in high-income nations that has little impact on developing countries.
- Non-English publications.

### 2.4 Data Extraction and Synthesis

Using a thematic approach, texts were studied to point out the recurring themes, ideas, practical ways to apply them, and issues with the BCG Matrix in other or public areas (Cheng & Hou, 2022; Guo et al., 2024). The work focused on only three main aspects.

- The reasons behind using BCG Matrix in analyzing government organizations have been well established.
- Mainly using cases and sectors in developing countries.
- Legislation has changed or expanded the traditional model in various ways.

Using this method, the paper tries to outline the main topics, identify what is missing, and present a way to modify the BCG Matrix for public organizations in underserved environments.

## 3. Theoretical Framework

### 3.1 The BCG Matrix: Origins and Core Constructs

Bruce Henderson, for resource optimization purposes, developed the Boston Consulting Group (BCG) Matrix during the 1970s to aid businesses. It utilizes the rates of business units or product growth in the market and their market share to form two dimensions of the matrix (Chiu & Lin, 2019; Dong et al., 2022). Using the matrix, it's possible to distinguish between four groups.

- Stars are products or services with quick growth and a strong position that need investment to hold their place and benefit from growing (Fu et al., 2022; Lin, 2023).
- Cash Cows are the products or services where growth is limited, while their share in the market is high; these units bring surplus profits with little effort (Ahn, 2025; Schmidt et al., 2025).
- Question Marks are the products or services with strong growth and a small market position; choices between keeping them and getting rid of them are needed due to uncertainty over the future (L. Yang et al., 2025; Zaffran et al., 2025).
- Dogs reflect the products or services were normally, these have very little increase in value and sales; since they're failing, it's typical to suggest selling them or reorganizing their structure (Lim, 2025).

Here, it is considered that companies operate in a competitive market, use revenue as main targets, and can make their own decisions without much interference. Because it was simple and clear to understand, it became a favorite tool for companies in their strategy in the late 20th century (Ha et al., 2021; L. Yang et al., 2025).

### 3.2 Strategic Management in the Public Sector

The goals, structure of accountability, relationships with stakeholders, and measurements of performance differ a lot between the two sectors (Hollaar et al., 2025; Malhotra et al., 2025). Unlike private companies, public institutions usually strive to create value, ensure fairness, and assure the organization thrives into the future (Ismayilo et al., 2022; Shalom et al., 2025). Also, operating in monopolistic or controlled industries means that market-based measures such as market share do not apply to them (Prayag et al., 2024).

Nevertheless, strategies from management have become more popular in public administration, mainly thanks to the New Public Management and Results-Based Management paradigms (Prayag et al., 2024; Z. Yang et al., 2025). They support efficiency, focus on results, and evidence-based distribution of resources ideas that are similar to the BCG framework (Chiu & Lin, 2019; Do et al., 2022). The changes include using performance scorecards, KPIs, and budgeting for programs in the public sector.

### 3.3 Theoretical Adaptation: From Market Share to Public Value

When using the BCG Matrix in the public sector, most especially in developing nations, its categories and axes should be redefined. Some scholars suggest that market share and growth rate can be represented by the following indicators:

- Measuring success by service uptake, people's satisfaction, results for society, or the effective spread of resources (Guo et al., 2024).
- Operational Sustainability: Indicates that an entity is able to run within its set budget and comply with its responsibilities (X. Yang et al., 2023).

It allows public sector entities to be divided into the following categories.

- Stars are sustained, well-known businesses—these are companies that can be expanded further (Cheng & Hou, 2022).
- Cash Cows are successful for running, though their growth is minimal—should be preserved and operated efficiently (Dong et al., 2022).
- Question marks show potential, but do not meet expectations therefore, they need attention in the form of changes or added resources (Chiu & Lin, 2019).
- Dogs: They do not perform well and are not essential, which makes them possible candidates for being rationalized or merged (Guo et al., 2024).

Better understanding is required so that the BCG Matrix can help in situations where resources are limited, politics matter, and social responsibility is important (Cheng & Hou, 2022).

### 3.4 Application in Developing Economies

Such countries are usually challenged by disjointed institutions, being heavily controlled by donors, and having few resources, which prevent them from supporting many public bodies (Cheng & Hou, 2022; Musayeva, 2023). If the BCG Matrix is applied wisely, it helps choose which reforms and investments to prioritize, instead of making choices only based on what politicians want. Yet, this application has to be examined closely to check if it fits the specific situation and is ethical (Dong et al., 2022).

The study examines the BCG Matrix in this new light to figure out how it helps in aiding the reform plans of developing economies' governments.

## 4. Emerging from Literature

Even though there is not much available material, what exists shows that the BCG Matrix can be used differently in the public sector, mostly in developing countries (Akyar et al., 2024a; Bernal Escoto et al., 2021). Such themes highlight the advantages and disadvantages involved in applying private sector

strategies in government (David et al., 2021).

#### **4.1 Adaptation of Strategic Tools for Public Sector Realities**

New Public Management (NPM) has led to more frequent use of strategic management tools in public administration, according to many public administration books. Several scholars note that while applying strategic prioritization is useful, there is a significant gap between the performance measures in public organizations and those in private companies (Gray, 2021; Ha et al., 2021).

A number of experts believe that factors such as their reach, impact, integration, and budget success are better measures than market position and growth when it comes to understanding public sector businesses (DeCaro et al., 2025; Park, 2025). Because of this change, new ways of thinking about success are needed, so that more attention is given to equity, accessibility, and children's well-being instead of financial profit (L. Yang et al., 2025).

#### **4.2 Selective Applications in SOEs and Quasi-Governmental Bodies**

The BCG Matrix is typically used by both state-owned enterprises (SOEs) and quasi-governmental bodies working in competitive market sectors (DeCaro et al., 2025; Hernes et al., 2025), for example in utilities, public transportation, farming, or industrial development programs. Here, the BCG Matrix is usually used to analyze different situations.

- Classify companies that may benefit from privatization, restructuring, or merging processes (Hernes et al., 2025; Malhotra et al., 2025).
- Check how much the costs are and how significant the strategy is in terms of achieving goals (ADB, 2016).
- Direct donors help and development support by following the tiers assigned to the institution (Hollaar et al., 2025).

Evidence from India, Kenya, South Africa, and Pakistan shows that the success of right to information (RTI) can change based on the support from political figures, amount of data, and how well the RTI is carried out.

#### **4.3 BCG Matrix as a Decision-Support Tool for Rationalization**

Several experts and policy makers suggest using the BCG Matrix to rationally manage and reform unsuccessful parts of the public sector (Plaček et al., 2025). When an excessive number of unproductive state organizations exist in a country, a modified BCG matrix may help by offering a straightforward way to look at the issue (Guo et al., 2024; Kumar et al., 2025).

- Observing which “Dog” businesses are not well-performing and are unreliable for the company's success.
- Supporting “Star” organizations that give high-quality public services.
- Making decisions on where to put money for uncertain businesses.
- Smoothing the cash flow of “Cash Cow” companies to use their funds elsewhere.

Aligning with the demands for fiscal restraint, handling excess risks, and better public administration is what such rationalization aims (David et al., 2021; Ha et al., 2021) for, mainly in IMF and World Bank funded programs.

#### **4.4 Challenges and Criticisms of Transferring Business Logic**

Even so, different criticisms have been raised about using the BCG Matrix in public organizations. Literature suggests that one must be careful with technocratic and mechanical adaptations of private sector models, mainly for services like human rights, those that are non-rival, or politically key (Akyar et al., 2024b; L. Yang et al., 2025). Critiques include:

- Trying to simplify the various tasks that the public sector must handle.
- Disregard for issues that affect society overall and in the distant future.
- Prioritizing money over other important aspects in education and healthcare.

Scholars, for example, Hood (1995) and Osborne (2006), state that neglecting context may cause such tools to change public priorities unintentionally or lead to giving priority to quick results.

#### 4.5 Emerging Practices and Hybrid Models

There are now suggestions for using a mix of BCG framework principles and public value ideas along with methods of participatory evaluation (Pham & Vu, 2025). So, for instance, some methods put in multi-criteria scorecards include talking with affected stakeholders or add both equity and sustainability data to the traditional BCG framework (Musa & Enggarsyah, 2025; L. Yang et al., 2025). They try to keep the simple nature of the matrix while adding more to its usefulness in making policies (Alibašić, 2025; Zaffran et al., 2025).

### 5. Proposed Adaptation of the BCG Matrix for Public Sector Entities in Developing Economies

#### 5.1 Rationale for Adaptation

The analysts behind the classical BCG Matrix thought it would be useful for profit-focused businesses, given solid market statistics and a clear relationship between profits and business strategies (Ismayilo et al., 2022; Shalom et al., 2025). In some developing economies, these ideas tend not to be true in the public sector. Most of the time, public organizations act in areas without competition, try to achieve different goals, and answer to several groups of stakeholders (Moore & Schindler, 2022).

Thus, a special version of the BCG Matrix should be used that keeps it simple, logical, and suits the priorities and challenges found in developing countries (Guo et al., 2024; X. Yang et al., 2023).

#### 5.2 Proposed Axes for Public Sector Use

For our graph, we use two public sector-related markers rather than the traditional Market Growth Rate and Relative Market Share ones.

- The X-axis represents the Relation of the sector to the strategic goals of the country. This axis reviews how much an entity helps achieve national goals such as addressing poverty issues, ensuring food security, providing energy, or moving toward a digital society. For example, indicators can be in the form of policy agreement, combining efforts from various sectors, and suitability with SDGs.
- Y-Axis: How well the institution operates and its ability to operate financially

It reviews how successfully the entity manages its tasks and uses the resources given to it. Metric examples you may use are the rate of funding used, how well services are delivered, if audits are followed, how efficiently finances are managed, and the capacity to get funding from different resources (Guo et al., 2024).

#### 5.3 Reinterpreted Quadrants for Public Entities

The following list includes the outcomes of applying this framework:

- **Strategic Catalysts (Stars)**  
Sharing the country's goals and running with high levels of efficiency (Chiu & Lin, 2019; Dong et al., 2022). They are at the core of change and should be provided with the main support, new innovations, and ways to grow.
- **Public Utilities (Cash Cows)**  
Entities with high operational sustainability but lower strategic centrality. They often provide routine but essential services (e.g., civil registry, basic utilities) and can generate surplus or cost

savings for the state (Cheng & Hou, 2022; X. Yang et al., 2023).

- **Policy**

**Dilemmas**

**(Question Marks)**

High strategic relevance but low effectiveness or sustainability. These entities are often politically important but plagued by inefficiency, underfunding, or poor management. Strategic interventions or reforms are needed (Chiu & Lin, 2019; Dong et al., 2022).
- **Reform**

**Candidates**

**(Dogs)**

Entities with low strategic contribution and low effectiveness. Products or services with low value to the organization and struggle to perform well. These organizations may not be needed, serve the same purpose, or do not function properly, so some sort of restructuring is required (Guo et al., 2024; X. Yang et al., 2023).

## 5.4 Application Potential

This approach provides management in the public sector a reliable way to assess and report on different areas of their performance:

- State-Owned Enterprises (SOEs)
- Public-Private Partnerships (PPPs)
- Government-Affiliated Boards, Authorities, or Trusts
- Sectoral Programs with autonomous governance (e.g., Agri-livestock or Urban Development bodies)

When entity-level problems are coordinated with national policies, this matrix allows the government to distribute funds wisely, restructure the organization, and work toward reform in the public sector, which are all important in resource-short areas (Chiu & Lin, 2019).

## 5.5 Case of Punjab Agriculture & Meat Company (PAMCO)

Punjab Agriculture & Meat Company (PAMCO), a government-owned enterprise operating in the Agri-livestock sector of Pakistan, exemplifies the need for a contextualized strategic evaluation model such as the adapted BCG Matrix. Since its formation, PAMCO was meant to support Pakistan's red meat sector, grow exports, and promote modern farming, but it has suffered from livestock and agriculture sectoral issues coupled with financial constraints (Afshar M. Z., 2023).

### PAMCO's Assessment through the Adapted BCG Matrix

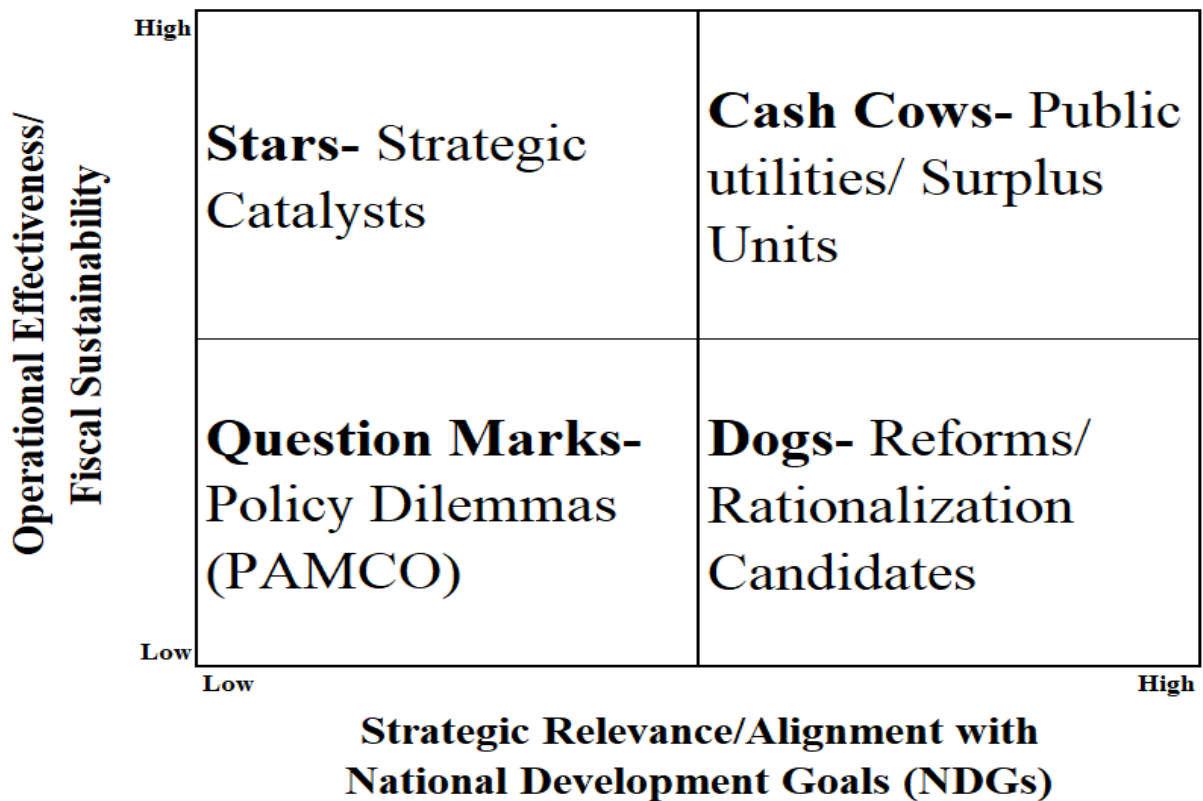
| Criteria                                  | Assessment                                                                                                                                   |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Strategic Relevance/ NDG Alignment        | High — aligns with Pakistan's goals for food security, rural livelihoods, and meat export diversification.                                   |
| Operational Effectiveness/ Sustainability | Moderate to Low — constrained by inconsistent funding, sectoral gaps, limited scale-up of abattoir infrastructure, and underutilized assets. |

PAMCO is key in contributing to farming changes, promoting exported goods, and boosting livestock production in both public and private sectors. Nonetheless, its working problems including unpaid debts, separation of duties, and underperformance on the market make it harder for it to thrive continuously. By this measure, PAMCO is defined as a policy dilemma that needs interventions instead of being eliminated. Recommended strategies include:

- Institutional realignment with the Livestock & Dairy Development Department (L&DDD).
- Governance streamlining through conversion into a **special-purpose enterprise** focused on sectoral development.
- Capacity building in quality certification, market intelligence, and meat value chain integration.

- Govt. loan conversion into equity coupled with provision of adequate endowment funding for revamping the infrastructure.

This application proves that it is possible for the BCG Matrix to support provincial or national administration in evidence-based decisions, which would prevent entities such as PAMCO from being ignored or disbanded prematurely.



*Figure 1: Adapted BCG Matrix for Public Sector Entities in Developing Economies*

## 6. Policy Implications

With the help of the BCG Matrix, regulations and plans can be designed to fit the structural, financial, and growth needs of government organizations in developing economies. This framework has important policy implications because it links the evaluation of different entities with the country's national development plans:

### 6.1 Strategic Resource Allocation

Through the matrix, decisions are taken based on the evidence available. Strategic Catalysts (Stars) institutions should receive more investments, additional funds for innovation, and extra organizational support, since their achievements are vital to important transformations. Likewise, governments can use Reform Candidates (Dogs) to identify areas for restructuring, consolidation, or getting rid of them so as to divert money to more important sectors.

### 6.2 Institutional Reform and Rationalization

There are too many different and overlapping functions in ministries and other government organizations in the developing countries. The matrix helps find parts of the government sectors that are not performing well and have low alignment, so that public sector rationalization can be carried out. Such as PAMCO, examples in this category prove that targeted adjustments are needed instead of allowing the businesses to be neglected or closed. Authorities may perform reviews, audits, and interventions to correct the problems in a department's organization.

### 6.3 Performance-Based Governance and Accountability

Applying this model encourages officials to concentrate on results and impact, instead of just what is done. Using this matrix, organizations in the public sector can be designed to think about ongoing improvements. Therefore, public sector boards, oversight committees, and donor agencies can review the budget as well as discuss whether or not the agency contributes to job creation, makes climate change less of a problem, or promotes digital inclusion.

### 6.4 Enhancing Intergovernmental and Interagency Coordination

Organizations that are part of the Policy Dilemmas or Cash Cow groups usually have to follow rules set in place by several federal agencies. The matrix ensures that members of all tiers of government can understand one another and therefore cooperate in planning, arranging co-financing, and combining efforts between departments or ministries.

### 6.5 Evidence for Development Partners and Multilateral Institutions

Identifying strong and important public sector organizations in developing markets can be tough for many development financing institutions and donor agencies. Using the BCG Matrix makes it possible for donors to decide which entities in the portfolio to address, since targeting those with both high strategy and low sustainability might highly benefit development.

## 7. Conclusion and Future Study Requirements

### 7.1 Conclusion

The traditional BCG Matrix has been examined in this review to see how applicable it is to assess performance in developing economies' public sectors. Although the original concept was made for firms trying to make profits in competition, the public sector works under its own set of rules, such as promoting development, being answerable to citizens, and facing spending limits.

To solve the challenge, the study suggested adapting the BCG Matrix by including two extra factors on the axes.

- Ensuring the strategy helps to accomplish what the government has aimed at.
- Ensuring the organization is operating sustainably through resource optimization.

Although diagnostic clarity is kept, this view also considers that public sector performance is influenced by a number of factors. When entities are sorted as Strategic Catalysts, Public Utilities, Policy Dilemmas, or Reform Candidates, the model gives policymakers an easy-to-use and logical decision-making resource (Chiu & Lin, 2019; Manyueva & Karapetyan, 2023).

This approach was highlighted in the case of Punjab Agriculture & Meat Company (PAMCO), which led to the realization that there were problems between strategy and the strength of the company, so appropriate reforms could be made instead of the organization abandoning its path.

### 7.2 Future Study Requirements

Despite being a useful tool, the modified BCG Matrix can be improved and confirmed with evidence through more research and policy efforts. Important areas to study in the future are:

- **Empirical Testing Across Sectors:** Using the modified matrix in multiple public sectors (for example, health, education, agriculture, and infrastructure) in different developing countries to see if it is reliable and can be used to various ends.
- **Indicator Development:** Reformulation of measures for both relevance and operations by examining public sources, collecting opinions from others, and consulting with experts.
- **Integration with Other Models:** Combining this adapted matrix with the Public Value Scorecard, Logic Models, or Theory of Change frameworks helps in carrying out a

multidimensional assessment.

- **Longitudinal and Comparative Studies:** Examining how public sector entities transition across matrix quadrants over time, especially in response to policy reforms, leadership changes, or funding variations.
- **Digital Tools and Dashboards:** Making use of digital platforms or analytical tools to monitor organizations in real time by public sector boards, ministries, or donor agencies.

## 8. Declaration

**Ethics Approval and Consent to Participate:** This study was conducted in compliance with the academic ethical guidelines for research ensuring informed consent and adherence to data privacy.

**Conflicts of Interest:** The author declares that there is no conflict of interest related to this study.

**Acknowledgement:** All contributing authors have been duly acknowledged, and all relevant author details mentioned in an appropriate manner.

## References

- Afshar M. Z. (2023). Exploring Factors Impacting Organizational Adaptation Capacity of Punjab Agriculture & Meat Company (PAMCO). *International Journal of Emerging Issues in Social Science, Arts, and Humanities*, 02(01), 01–10. <https://doi.org/10.60072/ijeissah.2023.v2i01.001>
- Ahn, H. J. (2025). The Cross Section of AI and Sustainability: Extensive Topic Modeling of Ten Years of Research. *IEEE Access*. <https://doi.org/10.1109/ACCESS.2025.3552974>
- Akyar, D. A., Celik, M. S., & Ceylan, B. O. (2024a). Global terminal operators: a competitive strategic position analysis. *Maritime Policy & Management*, 51(6), 1210–1228. <https://doi.org/10.1080/03088839.2023.2248985>
- Akyar, D. A., Celik, M. S., & Ceylan, B. O. (2024b). Global terminal operators: a competitive strategic position analysis. *Maritime Policy & Management*, 51(6), 1210–1228. <https://doi.org/10.1080/03088839.2023.2248985>
- Alibašić, H. (2025). Advancing disaster resilience: The ethical dimensions of adaptability and adaptive leadership in public service organizations. *Public Integrity*, 27(3), 209–221. <https://doi.org/doi.org/10.1080/10999922.2024.2388285>
- Amat, G., & Wang, J. (2025). The impact of social networks on rural residents' engagement in living environment upgrade: An integrated analysis drawing on social network theory and the theory of planned behavior. *PloS One*, 20(1), e0312779. <https://doi.org/10.1371/journal.pone.0312779>
- Bernal Escoto, B. E., Montero Delgado, N. I., & Rivera Aguirre, F. A. (2021). Strategic analysis of sustainable tourism in Baja California against COVID-19. *Sustainability*, 13(7), 3948. <https://doi.org/10.3390/su13073948>
- Cheng, T.-M., & Hou, H.-Y. (2022). Intelligent Educational Evaluation of Research Performance between Digital Library and Open Government Data. *Applied Sciences*, 12(2), 791. <https://doi.org/10.3390/app12020791>
- Chiu, C.-C., & Lin, K.-S. (2019). Rule-based BCG matrix for product portfolio analysis. *International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing*, 17–32. [https://doi.org/10.1007/978-3-030-26428-4\\_2](https://doi.org/10.1007/978-3-030-26428-4_2)
- David, M. E., David, F. R., & David, F. R. (2021). Closing the gap between graduates' skills and employers' requirements: a focus on the strategic management capstone business course. *Administrative Sciences*, 11(1), 10. <https://doi.org/10.3390/admsci11010010>

- DeCaro, D. A., Schlager, E. C., & Boamah, E. F. (2025). The State-reinforced self-governance framework: conceptualizing and diagnosing legal and other institutional foundations of adaptive and transformative environmental governance. *Ecology and Society*, 30(2). <https://doi.org/10.5751/ES-15567-300201>
- Do, H., Budhwar, P., Shipton, H., Nguyen, H.-D., & Nguyen, B. (2022). Building organizational resilience, innovation through resource-based management initiatives, organizational learning and environmental dynamism. *Journal of Business Research*, 141, 808–821. <https://doi.org/10.1016/j.jbusres.2021.11.090>
- Dong, W., Zhao, G., Yüksel, S., Dinçer, H., & Ubay, G. G. (2022). A novel hybrid decision making approach for the strategic selection of wind energy projects. *Renewable Energy*, 185, 321–337. <https://doi.org/10.1016/j.renene.2021.12.077>
- Fu, R., Zheng, B., Wen, J., & Xie, L. (2022). Research on commodity business value and customer value of e-commerce platforms: Based on consumer psychology and cognition. *Frontiers in Psychology*, 13, 985537. <https://doi.org/10.3389/fpsyg.2022.985537>
- García-Vidal, G., Sánchez-Rodríguez, A., Pérez-Campdesuñer, R., & Martínez-Vivar, R. (2023). Contribution margin and quantity matrix to analyze the product portfolio in the context of SMEs. Criticism of the BCG matrix and its alternatives. *Cogent Business & Management*, 10(3), 2233272. <https://doi.org/10.1080/23311975.2023.2233272>
- Gray, D. (2021). What makes successful frameworks rise above the rest. *MIT Sloan Management Review*, 62(4), 1–6.
- Guo, Q., Yang, C., Wang, X., Wan, Z., Zhang, G., Cui, J., Xue, Y., Sun, H., Chen, D., & Zhao, W. (2024). New insights on the spatial and temporal distribution characteristics of Chinese marine environmental quality and its driving factors from 2003 to 2021. *Ecological Indicators*, 161, 111903. <https://doi.org/10.1016/j.ecolind.2024.111903>
- Ha, J., Yu, C., & Hwang, Y. (2021). Analyzing the impact of relative push and pull factors on inbound medical tourism in South Korea: focused on BCG matrix applied segment group characteristics. *Asia Pacific Journal of Tourism Research*, 26(7), 768–779. <https://doi.org/10.1080/10941665.2021.1908387>
- Hambrick, D. C., MacMillan, I. C., & Day, D. L. (1982). Strategic attributes and performance in the BCG matrix—A PIMS-based analysis of industrial product businesses. *Academy of Management Journal*, 25(3), 510–531.
- Hernes, T., Blagoev, B., Kunisch, S., & Schultz, M. (2025). From bouncing back to bouncing forward: A temporal trajectory model of organizational resilience. *Academy of Management Review*, 50(1), 72–92. <https://doi.org/10.5465/amr.2022.0406>
- Hollaar, M. H. L., Kemmere, B., Kocken, P. L., & Denktaş, S. (2025). Resilience-based interventions in the public sector workplace: a systematic review. *BMC Public Health*, 25(1), 350. <https://doi.org/10.1186/s12889-024-21177-2>
- Ismayilo, V., Shalbuzov, N., Cabbarli, L., Safarov, A., & Karimova, V. (2022). Government agencies in the field of sustainable agricultural development in various countries. *Rivista Di Studi Sulla Sostenibilità: XII*, 2, 2022, 165–183. <https://doi.org/10.3280/RISS2022-002011>
- Kumar, J., Rana, S., Rani, V., & Ahuja, A. (2025). What affects organic farming adoption in emerging economies? A missing link in the Indian agriculture sector. *International Journal of Emerging Markets*, 20(5), 1849–1868. <https://doi.org/10.1108/IJOEM-03-2023-0390>
- Lim, J. Y. (2025). Development of a Business Simulation Program for Nurse Entrepreneurs in

- Integrated Long-Term Care Services. *Journal of Home Health Care Nursing*, 32(1), 45–56. <https://doi.org/10.22705/jkashcn.2025.32.1.45>
- Lin, C.-Y. (2023). Integrating the two-stage of non-radial DEA model and BCG methods to evaluate the performance with strategic trajectory: a case study of securities industry. *Portuguese Economic Journal*, 22(3), 439–455. <https://doi.org/10.1007/s10258-022-00206-1>
- Malhotra, G., Dandotiya, G., Shaiwalini, S., Khan, A., & Homechaudhuri, S. (2025). Benchmarking for organisational competitiveness: a resource-based view perspective. *Benchmarking: An International Journal*, 32(3), 943–964. <https://doi.org/10.1108/BIJ-09-2023-0668>
- Manyaeva, V. A., & Karapetyan, L. A. (2023). Analysis of Competitiveness of Logistics Companies. *International Conference Engineering Innovations and Sustainable Development*, 185–192. [https://doi.org/10.1007/978-3-031-38122-5\\_25](https://doi.org/10.1007/978-3-031-38122-5_25)
- Moore, J. W., & Schindler, D. E. (2022). Getting ahead of climate change for ecological adaptation and resilience. *Science*, 376(6600), 1421–1426.
- Musa, S., & Enggarsyah, D. T. P. (2025). Absorptive capacity, organizational creativity, organizational agility, organizational resilience and competitive advantage in disruptive environments. *Journal of Strategy and Management*, 18(2), 303–325. <https://doi.org/10.1108/JSMA-10-2023-0265>
- Musayeva, S. (2023). USE OF MATRIX ANALYSIS METHODS IN THE MARKETING STRATEGY OF ENTERPRISES. *Science and Innovation*, 2(A12), 179–187.
- Park, J.-W. (2025). An Analysis of the Capacity of Outdoor Earthquake Evacuation Sites in Daegu, South Korea: Assessing De Facto Population Dynamics and Accessibility Through the Geographic Information System (GIS). *Sustainability*, 17(5), 2129. <https://doi.org/10.3390/su17052129>
- Pham, Q. H., & Vu, K. P. (2025). Management accounting control system and risk governance in public sector organizational resilience enhancement. *Cogent Social Sciences*, 11(1), 2444473. <https://doi.org/10.1080/23311886.2024.2444473>
- Plaček, M., Daniel, G., Valentinov, V., Ochraňa, F., & Kovács, R. (2025). Resilience strategies of public organizations and social enterprises: evidence from Slovakia and the Czech Republic. *International Journal of Public Sector Management*. <https://doi.org/10.1108/IJPSM-06-2024-0200>
- Prayag, G., Muskat, B., & Dassanayake, C. (2024). Leading for resilience: Fostering employee and organizational resilience in tourism firms. *Journal of Travel Research*, 63(3), 659–680. <https://doi.org/10.1177/00472875231164984>
- Schmidt, A., Lütge, J., Uhl, A., Köster, D., & Jochen, S. (2025). Business Cases for Digital Twins in Biopharmaceutical Manufacturing—Market Overview, Stakeholders, Technologies in 2025 and Beyond. *Processes*, 13(5), 1498. <https://doi.org/10.3390/pr13051498>
- Shalom, T., Dayan, T., & Feitelson, E. (2025). Public sector involvement in non-state governances for sustainable food systems—a biodiversity perspective. *Frontiers in Sustainable Food Systems*, 9, 1489266. <https://doi.org/10.3389/fsufs.2025.1489266>
- Yang, L., Xu, Z., Yuan, F., Liu, Y., & Tian, G. (2025). Boston Consulting Group Matrix-Based Equilibrium Optimizer for Numerical Optimization and Dynamic Economic Dispatch. *Electronics*, 14(3), 456. <https://doi.org/10.3390/electronics14030456>
- Yang, X., Li, W., Zhang, P., Chen, H., Lai, M., & Zhao, S. (2023). The dynamics and driving mechanisms of rural revitalization in western China. *Agriculture*, 13(7), 1448.

Yang, Z., Dong, M., Guo, H., & Peng, W. (2025). Empowering resilience through digital transformation intentions: synergizing knowledge sharing and transformational leadership amid COVID-19. *Journal of Organizational Change Management*, 38(1), 59–81.

Zaffran, I., Zoabi, Y., Gaur, P., Alekberli, F. R., Tiligada, E., Yutkin, V., & Levi-Schaffer, F. (2025). Eosinophils but not mast cells exert anti-tumorigenic activity, without being predictive markers of the long-term response to Bacillus Calmette-Guérin (BCG) therapy in patients with bladder carcinoma. *Inflammation Research*, 74(1), 1–14. <https://doi.org/10.1007/s00011-025-02028-1>