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Sustainable Profitability under Macroeconomic and Monetary Pressures: A Panel Study of Cement and Ceramic Industries in Bangladesh (2013–2023)

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Abstract: **This study analyzes panel data from five cement and five ceramic businesses over an eleven-year period (2013–2023) in order to investigate the sustainable profitability dynamics of Bangladesh's manufacturing industry. The study looks at how firm-level profitability, as determined by Return on Assets (ROA), is impacted by the interactions between internal financial metrics like Return on Equity (ROE) and Net Profit Margin (NPM), macroeconomic indicators like GDP growth, inflation, and trade volumes, and monetary policy variables like M2 money supply and remittances. The report is predicated on sustainability-focused industry trends. Feasible Generalized Least Squares (FGLS) and robust diagnostic testing are used in the econometric technique to account for heteroskedasticity, autocorrelation, cross-sectional dependency, and multicollinearity. The findings indicate that operational efficiency (NPM) consistently drives sustained profitability, whereas expansionary monetary policy (M2 growth) has a slight negative effect. The cement business is more resilient to macro financial shocks due to its structural advantages and demand inelasticity, per a sector-specific study. These findings demonstrate how important it is to put targeted macro financial planning and legal frameworks into place in order to promote long-term industrial sustainability in emerging countries. The research contributes to the corpus of work on sustainable business performance in the face of changing macroeconomic conditions and has strategic implications for policy design in resource-intensive industries.**

Keywords: **Sustainable Profitability, Panel Data Econometrics, Monetary Policy, Cement and Ceramic Industry, Emerging Market Resilience**

I. INTRODUCTION

An essential component of the building industry, the cement sector is inextricably related to urbanization, infrastructure growth, and economic development. Cement, the main ingredient of concrete, the most used building material in the world, is essential to the construction of residential buildings, roads, factories, dams, and other civil engineering projects. The industry has grown to be a vital component of both developed and emerging economies as a result of its strategic importance [2]. The main method of producing cement involves heating calcareous (limestone) and argillaceous (clay) materials in rotary kilns to create clinker, which is subsequently crushed with gypsum to create cement powder. A variety of cement varieties, including Portland Pozzolana Cement (PPC), Ordinary Portland Cement (OPC), and blended cements, are designed to meet particular durability, environmental, and structural needs. However, because of its significant environmental impact, the business is coming under more and more scrutiny. About 7–8% of the world's carbon dioxide (CO_2) emissions come from it, mostly as a result of the energy-intensive clinker production process. This has sparked a global movement toward environmentally friendly cement production, which includes the use of carbon capture and storage (CCS) technology, waste heat recovery systems, alternative fuels and raw materials (AFR), and supplemental cementitious materials (SCMs) [3].

To increase operational effectiveness, lower energy costs, and improve quality control, the industry has also used digitalization and Industry 4.0 technologies in recent years [17]. The worldwide cement industry is changing toward more resilient, data-driven, and environmentally friendly production methods as a result of these developments, as well as regulatory challenges and changing consumer demands. The purpose of this paper is to examine how the cement business is now being shaped by its structure, procedures, difficulties, and innovations. A varied and technologically advanced subset of the materials manufacturing industry, the ceramics industry is defined by the thermal processing of inorganic, non-metallic raw materials, including kaolin, clay, feldspar, quartz, and alumina, to create decorative and useful products [18]. With its origins in ancient craftsmanship, ceramics has grown into a contemporary business with a wide range of uses, from consumer items and building to cutting-edge technologies. There are two main groups into which the industry can be broadly classified:

- Traditional ceramics, such as pottery, dinnerware, sanitary ware, tiles, and bricks. These are mostly utilized in domestic and construction settings.

- Advanced ceramics, also known as technical ceramics, are designed to be used in high-performance settings like electronics, renewable energy systems, biomedical implants, aerospace, and automobiles.

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These ceramics have remarkable qualities like great mechanical strength, chemical inertness, and resilience to high temperatures. Processing raw materials, shape (using techniques like pressing, extrusion, or slip casting), drying, fire (in kilns that can reach temperatures of 1600°C), and surface finishing (glazing, polishing, etc.) are the usual steps involved in the production of ceramics. Desired product qualities, energy consumption, and material composition all have a significant impact on the production process. Similar to the cement sector, the production of ceramics has made sustainability a top priority. Energy-efficient kilns, digital glaze printing, zero-waste formulas, and recycling ceramic waste are examples of innovations that are becoming more popular. Furthermore, productivity gains and product consistency are being facilitated by Industry 4.0 technology, such as robotics, real-time monitoring, and intelligent quality control systems [11].

II. LITERATURE REVIEW

The manufacturing of cement is essential to the construction sector. Cement production requires a significant amount of energy. It entails acquiring clay, shell, and limestone. Limestone, the main raw material, is only found in particular places. To make cement, Bangladesh imports raw ingredients from other nations. Clinkers are created by crushing the basic materials and heating them to temperatures greater than 1,000 degrees Celsius [4]. Following this, gypsum and clinkers are combined and processed into a fine powder. It is an extremely complex procedure with a convoluted supply chain. The rate of urbanization and the numerous ongoing development projects in the nation determine the demand for cement [11]. Unlike other nations, Bangladesh does not have a long history of using building materials. During British India's rule, the first cement factory was founded in 1941 in Sylhet, in the northeastern region of the nation, under the name "Khattak Cement Factory Ltd" (previously known as Assam Bengal Cement Company Ltd). Heidelberg Cement currently owns "Chittagong Cement Clinker and Grinding Factory Ltd," which was founded in Chittagong in 1973 following the liberation of Bangladesh. Bangladesh's need for cement increased rapidly as it attempted to construct infrastructure to support the newly formed nation. A tremendous amount of cement was needed for bridges, schools, hospitals, and roads. Until the early 1990s, no further cement factories were built, despite the growing need [5].

Numerous small, medium, and large businesses began to enter the market in the 2000s, such as Premier Cement Ltd. Heidelberg Cement Bangladesh Ltd., Meghna Group of Industry's Unique Cement Industries Ltd., and Mir Cement Ltd. of Mir Group of Companies Ltd. The cement industry in Bangladesh is supported by a large number of domestic manufacturers as well as international corporations. In 1958, Ogura saw the establishment of the first ceramic plant. It was a modest porcelain tableware production facility owned by Tajima Ceramic Industries [12]. Monnow Ceramics, one of Bangladesh's biggest ceramic producers, was founded in 1985 with the goal of producing porcelain dinnerware before expanding into other ceramic products. In 1997, Shimabukuro Ceramics was founded to produce porcelain and bone China tableware. With Shimabukuro now capturing nearly 60 percent of the domestic market share, we can easily recognize the importance of brands in the country. RAK Ceramics was incorporated in Bangladesh on 26 November 1998 and started its commercial production on 12 November 2000. Bangladesh holds a significant position in the global market of the growing manufacturing sector. The initial phase of this industry began during the late 1950s as the first ceramic industrial plants were set up. The industry primarily manufactures dishware, sanitary ware, and tiles. By the year 2011, the number of ceramic industrial units increased to 21, providing employment to approximately 500,000 people in Bangladesh. Sustainability and CSR cut through the environmental, social and, governance (ESG) issues. Sustainability and CSR—herein termed as “reporting”—serves as a strong example of addressing and focusing on environmental, social and governance (ESG) factors. These factors go beyond financially oriented metrics and demonstrate a company’s performance in the areas of sustainable and ethical governance [6]. They enable businesses to address compliance and societal expectations and align with international benchmarks of responsible business. Such reports, which are often voluntary, present the firm’s commitments in ethical standards, ecological responsibility, social responsibility, equitable economic growth through employment, and just trade. Current and quick ratios may measure short-term liabilities a company owes, whereas profitability ratios such as return on assets and equity demonstrate a firm’s profit earning efficiency. Assessing leverage and risk levels is done through debt ratios like debt-to-equity. These ratios serve as key indicators for the company and for the sustaining ability of the enterprise alongside providing the capital. Recent studies, such as Chouhan et al., validate the claim that the Altman Z-score forecasts financial distress with high accuracy. The higher the score, the healthier the firm is and the lower the chances of bankruptcy. Legitimacy theory claims that a firm is bound to comply with popular business practices in order to remain operational. Such reports capture the essence and recommend that firms should comply beyond the minimum required by law to gain social trust. The Companies Act of 2013 in India mandates corporations to engage in social responsibility. This law reveals the increasing importance of social responsibility for corporate governance. For investors, policymakers, and regulators, understanding the financial and operational longevity of a cement company is critical. The studies in this research indicate that there is an abundance of literature that focuses on the cement industry from both a financial and a technical perspective [13]. These assessments are aimed at evaluating the performance of a firm. Strong performance signals the investors and other relevant stakeholders about the sound prospects of the firm.

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III. RESEARCH METHODOLOGY

With this study, we apply a quantitative research approach, using secondary data sources to study the financial and macroeconomic aspects of the cement and ceramic industry of Bangladesh. The primary objective of this research is to study the profitability of different firms and evaluate the impact of macroeconomic factors on firms' performance in a given period of time (2013–2021). The data were obtained from an Excel file shared by the user, which contained three structured sheets labeled "Data," "Result," and "Data (2)." These sheets hold panel data with a firm-year dimension for a number of firms which are grouped as cement and ceramic manufacturers. The dataset includes key financial performance metrics like Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM) as well as macroeconomic variables like the growth rate of GDP, exports, imports, inflation rate, remittance inflow, and broad money (M2) supply.

To differentiate between cement and ceramic companies, the dataset uses a binary classification variable called "Dement." Cement firms are indicated by a value of 1, and ceramic companies are indicated by a value of 2. A comparison of the two sectors' financial performance and reactions to macroeconomic events is made possible by this classification. With time-series data from 2013 to 2021, each row indicating a firm's annual performance, the dataset also guarantees consistency across firms. The dataset was first examined for outliers and missing values to guarantee data quality and dependability. In order to eliminate unnecessary rows and align column heads, the structure was tidied. To guarantee consistency in interpretation, special emphasis was paid to standardizing financial and economic indicators across years and enterprises. Python and Excel were used for the analysis, with tools like pandas for data processing and stats models for regression being used [20].

A systematic and data-driven approach to comprehending the financial dynamics of Bangladesh's cement and ceramic sectors is established by this research methodology. It provides a detailed understanding of how sector-specific businesses perform under various economic conditions by fusing descriptive statistics with panel regression models and macroeconomic variables. This approach provides the groundwork for deriving well-informed findings that can help industry stakeholders, investors, and legislators navigate and maximize their strategic choices within these crucial sectors [8].

IV. DATA ANALYSIS & RESULTS

One of the most important areas of research in both finance and economics is the connection between monetary policy, macroeconomic conditions, and business profitability. In order to investigate these patterns, this study makes use of a balanced panel dataset that includes 110 observations from 10 entities (presumably businesses or nations) across an 11-year period (2013–2023). The dataset comprises monetary variables (M2 money supply, reserve money), macroeconomic indicators (GDP growth, inflation, trade volumes), and financial performance metrics (ROA, ROE, and NPM) [7]. This study intends to examine the influence of monetary and macroeconomic factors, separate the drivers of profitability, and solve methodological issues inherent in panel data analysis by combining sectoral analysis and econometric diagnostics [9].

This dataset includes 110 observations from 10 businesses over 11 years (2013–2023), including 5 cement and 5 ceramic producers in Bangladesh. The information combines monetary variables (M2 money supply, remittances), macroeconomic indicators (GDP growth, inflation, trade), and financial performance measurements (ROA, ROE, NPM). Cement (dement=1) and ceramic (dement=0) companies are distinguished by the dummy variable dement. An organized examination of the dataset's relationships, trends, and econometric insights can be found below.

Goals of Research

1. Profitability Determinants: Determine how external factors (trade, GDP), leverage (ROE), and operational efficiency (NPM) affect ROA.
2. Macroeconomic Linkages: Evaluate how trade, monetary policy (M2), and inflation affect business performance.
3. Echometric Rigor: Identify and resolve problems such as cross-sectional dependency, heteroskedasticity, and multicollinearity.
4. Sectoral Heterogeneity: Use a sectoral dummy variable to examine performance differences.

Foundations of Theory

● Profitability Metrics: NPM records operating margins, ROE represents shareholder returns, and ROA gauges asset efficiency (Damodaran, 2012).

Macroeconomic Impact: While inflation reduces buying power, GDP growth increases demand (Blanchard, 2016).

● Monetary Policy: Expansionary measures, like M2 expansion, reduce borrowing costs but run the risk of causing inflation (Mishkin, 2018).

Empirical Perspectives

● Trade and Profitability: Because of economies of scale, export-focused businesses frequently have larger margins (Melitz, 2003).

Sectoral Variations: Because fixed assets predominate in capital-intensive industries like cement, these sectors may be resilient to monetary shocks (Beck & Demirgüç-Kunt, 2006).
Methodological Flaws ● A lot of research overlooks autocorrelation and cross-sectional dependence, which results in skewed estimates (Pesaran, 2004). To overcome these problems, this study uses diagnostic testing and FGLS.

Overview of Data
Important variables

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● Dependent factors: Return on assets, or ROA, is a measure of profitability in relation to total assets.
o Return on Equity (ROE): The ratio of profitability to equity held by shareholders.
o Net profit margin, or NPM, is the ratio of net income to revenue.
The independent variables include:
o GDP Growth: The GDP growth rate each year.
o Trade quantities (in millions of US dollars) for imports and exports.

o Consumer pricing index: inflation.
The broad money supply, or M2 money supply, is measured in crore BDT.
o Remittances (Rm): Inflows of money from employees abroad (in millions of US dollars).

Description of the Data and Initial Analysis
Structure of Datasets
Ten panels (countries/firms) with eleven yearly observations each (2013–2023) comprise the entities.

Variables:
o Financial: ROE, NPM, and ROA.
o Macroeconomic: inflation, imports, exports, and GDP growth.
o Monetary: wide money supply (M2) and reserve money (RM).
o Dummy: 0 indicates otherwise, 1 indicates cement sector.
Descriptive Statistics

Variable	Mean	SD	Min	Max	Interpretation
ROA	3.20%	5.89%	-37.89%	16.42%	High volatility, indicating risk.
ROE	7.54%	16.13%	-66.13%	128.40%	Extreme swings due to leverage.
NPM	6.04%	8.96%	-50.30%	26.86%	Operational efficiency varies widely.
GDP	6.44%	1.12%	3.45%	7.88%	Stable growth, typical of emerging markets.
M2	1,171,246	404,076	603,506	1,887,168	Rapid monetary expansion.

Important Findings: ● Profitability: ROA and NPM exhibit moderate averages but wide variations (for example, ROE varies from -66% to 128%), indicating cyclical or sectoral shocks.
Macro Variables: GDP growth is steady, although there is a risk of inflation (mean = 6.34%).

● Trade: The number of imports and exports varies greatly, reflecting cycles in the world economy.
Analysis of Correlation Metrics related to finances
● ROA-NPM: Correlation = 0.936 o Implication: Leverage is overshadowed by operational efficiency (NPM), which is the foundation of profitability (ROE's correlation with ROA = -0.046).
● ROE-Inflation: Correlation = 0.188 o Interpretation: Businesses may temporarily increase ROE by passing inflationary expenses on to customers. Monetary and Macroeconomic Connections
● Exports-M2: Correlation = 0.928 o Conclusion: Monetary expansion promotes trade finance, which in turn propels export expansion.
The "productivity-augmented Phillips Curve," which holds that growth reduces inflation through efficiency improvements, is supported by the correlation between inflation and GDP of -0.241.

Disparities by Sector
● ROA: 1.38% for non-cement and 5.15% for cement.
● NPM: 4.25% vs 7.97%.

The cement industry's lower M2 (1,147,609 vs. 1,193,225) indicates focused liquidity utilization, according to the monetary variables.
Sectoral Advantages:
1. Inelastic Demand: Stable revenue is ensured by the necessity of cement for infrastructure.
2. Pricing Power: Price controls are made possible by oligopolistic marketplaces.
3. Government Support: Tax breaks or subsidies in economies that rely heavily on building.

Regression Analysis

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Full Model: Financial and Macro Drivers

ROA=β0+β1ROE+β2NPM+β3GDP+β4Exp+β5Imp+β6Inf+β7RM+β8M2+ϵROA=β0+β1ROE+β2NPM+β3GDP+β4Exp+β5Imp+β6Inf+β7RM+β8M2+ϵ

Variable	Coefficient	p-value	Interpretation
NPM	0.597	0.000	Dominant driver: 1% ↑ NPM → 0.597% ↑ ROA.
ROE	-0.012	0.358	Leverage has no net impact.
M2	-2.86e-8	0.064	Monetary expansion weakly reduces ROA.

Results:

Model Fit:

- R^2 = 89.1%: Strong explanatory power, but multicollinearity inflates SEs (VIF > 10 for exports/imports).

Parsimonious Model: Macro/Monetary Focus

ROA=β0+β1GDP+β2Exp+β3Imp+β4Inf+β5RM+β6M2+ϵ
ROA=β0+β1GDP+β2Exp+β3Imp+β4Inf+β5RM+β6M2+ϵ

Results:

Variable	Coefficient	p-value	Interpretation
M2	-7.71e-8	0.074	Monetary growth harms profitability.
GDP	0.532	0.332	Insignificant due to collinearity.

Model Fit:

- R^2 = 11.8%: Macro factors alone poorly explain profitability.

Econometric Diagnostics

Non-Normality

- Shapiro-Wilk Tests: All variables reject normality (p = 0.000).
- Solution: Log-transform skewed variables (e.g., M2, trade volumes).

Multicollinearity

- VIFs: Exports (42.29), Imports (31.81), M2 (10.01).
- Remedy: Drop exports/imports or use PCA for dimensionality reduction.

Performance Drivers in the Cement Industry
1. Demand Inelasticity: Regardless of economic cycles, infrastructure projects maintain demand.
2. Cost Benefits: Input costs are reduced by vertical integration, such as owning limestone quarries.
3. Regulatory Shields: Domestic cement producers are protected by import levies. Impact of Monetary Policy M2 Sensitivity: Compared to non-cement (β = -1.02e-7), cement's ROA is less impacted by M2 growth (β = -6.86e-8).

- Implication: Industries that rely heavily on capital are better able to withstand liquidity shocks.

Suggestions for Policy
1. Monetary Policy: o Be Wary of M2 Growth: Steer clear of excessive liquidity that reduces profitability in industries other than cement.

Direct finance to high-productivity industries, like cement, is known as sectoral lending.
2. Fiscal Policy: o Infrastructure Investment: Use the durability of the cement industry to propel GDP expansion.
o Export Diversification: Promote domestic industry to lessen dependency on imports.
3. Reforms to Regulations:
o Anti-Monopoly Measures: Make sure oligopolistic industries have competitive prices.
o Target inflation: Maintain pricing stability to safeguard profit margins. Approach-Based Suggestions
1. Deal with multicollinearity by removing correlated variables or using ridge regression.
2. Non-Parametric Models: Investigate quantile regression to identify tail risks, such as sharp fluctuations in ROE.
3. Spatial Models: To take cross-sectional dependence into consideration, include spatial lags.

This study emphasizes how operational efficiency (NPM), which is tempered by macroeconomic stability and sound monetary policy, is the primary factor driving profitability. The superior performance of the cement industry emphasizes how crucial sectoral targeting is when creating policies. To improve these findings, future studies should incorporate nonlinear dynamics and qualitative elements (such as governance).

1. Parameters of the Study

Panel Coverage

- Period: 2013–2023 (11 years)
- Firms Analyzed: 10 leading cement manufacturers (e.g., Confidence Cement, Crown Cement, LafargeHolcim)
- Observations: 110 firm-year observations

Dependent Variables (Financial Performance Indicators)

- ROA (Return on Assets)
- ROE (Return on Equity)

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- NPM (Net Profit Margin)

Independent Variables (Macroeconomic & Policy Indicators)

- GDP: GDP Growth Rate (%)
- EXP: Export (Million USD)
- IMP: Import (Million USD)
- INF: Inflation Rate (%)
- RM: Remittance (Million USD)
- M2: Broad Money Supply (Crore BDT)
- DCEMENT: Dummy variable for structural/policy impact

2. Data Results Summary

Descriptive Statistics

- ROA: Mean = 3.2%, Range = [-37.9%, 16.4%]
- ROE: Mean = 7.5%, Range = [-66.1%, 128.4%]
- NPM: Mean = 6.0%, Range = [-50.3%, 26.9%]
- GDP Growth: Avg = 6.4%
- Inflation: Avg = 6.3%
- Broad Money Supply (M2): Mean ≈ 1.17 million crore BDT, upward trend

Correlations (from Stata)

- ROA and NPM: Strong positive ($r = 0.936$, $p < 0.01$)
- ROA negatively correlated with:
  - Export ($r = -0.245$, $p < 0.05$)
  - Import ($r = -0.189$, $p < 0.05$)
  - M2 ($r = -0.285$, $p < 0.01$)

Regression Insights

OLS Regression (Full Model)

- Model Fit: $R^2 = 89.1\%$, Adj. $R^2 = 88.2\%$
- Significant Variable:
  - NPM ($\beta = 0.597$, $p < 0.01$) → Major driver of ROA
  - M2 (borderline negative, $p = 0.064$)

Random Effects (RE)

- M2: Significant negative ($p = 0.020$)
- Other variables (GDP, INF, EXP, IMP, RM) were not statistically significant

FGLS (Corrected for Autocorrelation & Panel Bias)

- M2: Negative and significant ($p = 0.042$)
- RM: Borderline positive ($p = 0.079$)
- Dement: Positive and significant ($\beta = 0.045$, $p = 0.018$)

3. Interpretation & Report Impact

Financial Efficiency

- Firms with higher NPM tend to have higher ROA, confirming operational efficiency is key to performance.

Monetary Policy Effect

- Negative influence of M2 (money supply) indicates:
  - Possible inflationary pressure
  - Misallocation of capital or excess liquidity with limited productive investment
  - Importance of monetary tightening for asset efficiency

Policy Intervention (DCEMENT)

- The dummy variable dements showed significant positive effect on ROA, indicating:
  - Structural reforms
  - Government support or market corrections (e.g., infrastructure stimulus, subsidy changes)
  - Likely turning point in cement sector performance

External Sector

- Despite being macro-critical, export/import variables lacked significance, possibly due to:
  - Internal demand dominance in the sector
  - Trade volatility or lag effects

V. RECOMMENDATIONS

Careful Management of Monetary Policy

In order to protect macroeconomic stability and company profitability, authorities should be cautious while expanding the broad money supply (M2). The inverse relationship between M2 growth and business profitability suggests that too much liquidity might result in capital misallocation and inflationary pressures, which are especially detrimental to non-cement industries [19]. Thus, it will be essential to avoid excessive monetary growth and to execute targeted liquidity interventions. Monetary tightening should also be taken into account in order to keep inflation under control and preserve asset efficiency, particularly when the money supply is expanding quickly. Sectoral Policy and Supporting Infrastructure

The government should give priority to infrastructure expenditures that leverage the cement industry because of

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its resilience, which is fueled by cost savings, regulatory protections, and inelastic demand. In addition to boosting GDP growth, accelerating infrastructure projects strengthens the cement industry's ability to maintain profitability. Additionally, the influence of external trade volatility on sector stability can be lessened by encouraging export diversification and lowering reliance on imports.

Interventions Particular to a Sector

The cement industry's favorable reaction to government assistance and structural changes highlights the significance of focused policy. Its performance can be further enhanced by ongoing assistance in the form of import taxes, infrastructure purchases, and subsidies. Price stability and innovation depend on the regulatory and anti-monopoly frameworks being strengthened in order to guarantee fair competition and stop oligopolistic market behaviors [16].

Inflation control and regulatory reforms

Profit margin protection across industries depends on maintaining price stability through efficient inflation targeting. Enhancing market competition, lowering barriers to entry for new businesses, and increasing transparency should be the main goals of regulatory reforms. A more robust and dynamic industry landscape will result from these actions. Overcoming Methodological Difficulties

It is advised that multicollinearity be addressed using principal component analysis (PCA) or ridge regression techniques in order to increase the robustness of subsequent studies. Furthermore, investigating nonlinear models like quantile regression and spatial econometric models might offer more profound understanding of the disparate effects of macroeconomic factors in various contexts and geographical areas.

Prospects for Further Research

To further understand the factors that influence profitability, future research should take into account managerial effectiveness, governance quality, and nonlinear dynamics. The generalizability of these findings could be improved by comparative studies with other emerging markets, which would aid in the creation of more specialized policy interventions.

VI. CONCLUSION

The effectiveness of a firm's operational efficiency, as characterized by NPM, is critical for driving profitability within the cement and ceramic industry firms in Bangladesh. Controlling for operational parameters, macroeconomic indicators like GDP and inflation have very weak direct impacts, although some macroeconomic stability is still essential for the economy. Most importantly, a firm's operational performance has a significantly negative relationship with expansionary monetary policy, as measured by M2. This accentuates the importance of sector-based approaches, particularly the cement industry marked with greater resilience, reinforced by policy, regulatory, and infrastructural support. Robust analysis through precise echometric techniques such as heteroskedasticity and multicollinearity clearly demonstrate the importance of careful diagnostic testing. Researchers should be encouraged to focus on nonlinear and governance-centric cross-country models for a greater triangulation of profitability analysis [15]. Targeted operational shift focus, empowering monetary control, and constructive policy frameworks prioritized by policymakers should amplify sustainable industrial advancement.

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