




# “Impact of macroeconomic factors on firm performance: Empirical evidence from India”

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# IMPACT OF MACROECONOMIC FACTORS ON FIRM PERFORMANCE: EMPIRICAL EVIDENCE FROM INDIA

## Abstract

Understanding the macroeconomic factors is essential for all firms operating in the economy. Investment decisions, financing decisions, and risk management of firms are influenced by the existing macroeconomic factors, thereby impacting their performance. This paper examines the effect of macroeconomic factors on the performance of Indian manufacturing firms. Two-step generalized method of moments model is applied in this investigation to analyze the effect of firm performance from the financial year 2004-05 to 2021-22. Firm performance is proxied by two accounting-based measures and a market-based measure, namely, return on assets, return on equity, and Tobin's Q, respectively, while the macro-economic factor is proxied by annual gross domestic product growth rate. The empirical findings show that firm performance has a positive relationship with macroeconomic factors. In addition, the findings reveal that firm size, firm age, leverage, sales growth, and operating profit impact firm performance. The study further extends to examine the moderating effect of financing constraints (measured by firm size and age) on macroeconomic factors and firm performance. The results show that the effect is more pronounced on small and young firms as compared to large and mature firms. The study also evaluates the impact of macroeconomic factors on firm performance excluding the crisis periods (the financial crisis of 2008 and the COVID-19 pandemic) and finds the impact on the market performance to be insignificant during non-crisis periods. This study recommends that lenders, managers, and other stakeholders should take proactive policy measures for any anticipated adverse changes in macroeconomic factors on the performance of Indian firms.

## Keywords

performance, gross domestic product, ratios, financing, size, age, crisis, accounting-based, market-based

## JEL Classification

E23, G32

## INTRODUCTION

Several studies have used gross domestic product (GDP) as an indicator of macroeconomic factors (Cook & Tang, 2010; Gupta & Mahakud, 2020). When a country's GDP growth rate is high, coupled with a moderate rate of inflation existing in the nation, it is a favorable MEF, while when a country's GDP growth rate starts declining with a high rate of inflation existing in the nation, it is considered an adverse MEF (Tzang et al., 2013). Favorable MEF leads to reduced cost of external borrowings and increases the availability of external funds in the capital market, thereby providing easy access to firms. Besides, positive MEF gives an impetus to investments by attracting both domestic and foreign investors to invest during favorable factors, broadening the scope of borrowings. The firms' financial constraints are thus reduced paving the way for better firm performance. Firms face increased production, sales, and profitability during such times, which ultimately impacts their performance positively. Stakeholder theory states that the objective of business is to create value for all the parties involved (Freeman, 1984), and therefore, the relevance of firms performing well



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### Conflict of interest statement:

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cannot be ignored from the perspective of shareholders, lenders and the government. It is therefore of utmost importance to analyze the determinants of firm performance.

Firm performance is affected by several factors. However, these factors may differ across economies and nations, more specifically across developed and developing economies. In an emerging economy like India, the laws and regulatory frameworks, institutional limitations and work culture are distinct from those of other developed countries (Deshpandé & Farley, 1999; Gupta & Mahakud, 2020). The Indian economy has recently become the 5th largest economy in the world in terms of nominal GDP (World Economic Forum, 2020) and is aiming to become a global manufacturing hub with their 'Make in India' initiative. The contribution of manufacturing sector in India is nearly 16% to the country's GDP, which is expected to increase to 25% by 2025<sup>1</sup>. Therefore, the scope of further exploring the association between MEF and company performance together with the moderating role of firm size and firm age in the context of manufacturing firms operating in India is enhanced.

## 1. LITERATURE REVIEW

Prior literature on firm performance vastly focused on firm-specific factors such as firm age, firm size, leverage, liquidity, cash flow and sales growth (Altaf & Ahmad, 2019; Lin & Fu, 2017; Msomi & Nzama, 2023). The studies by Issah and Antwi (2017), Killins (2020), and Zeitun and Goaid (2022) focused on developed economies while exploring the macroeconomic influence on firm performance. The only study similar to this study is that by Ndlovu and Alagidede (2018), which focuses on BRICS nations and on financial firms. However, this study is different from that by Ndlovu and Alagidede (2018) in the following ways. Ndlovu and Alagidede (2018) focus on financial firms and use only a single proxy of firm performance namely return on equity (ROE). This study focuses on the performance of manufacturing firms; and adopts multiple proxies for firm performance as return on assets (ROA), ROE and Tobin's Q. Additionally, the research examines the moderating role of firm size and age. Consequently, the extant literature lacks empirical evidence on the effect of MEF on a firm's financial performance, more specifically in India. The association between MEF and company performance with the moderating role of firm size and age in the context of Indian manufacturing firms remains unexplored.

Endogenous countercyclical swings in price risk, default probability and losses result from how firms react to macroeconomic circumstances (Chen, 2010). Consequently, the risk-taking of firms is dependent on macroeconomic outlook (Gupta & Krishnamurti,

2018). Vural-Yavaş (2020) documented that at times of unfavorable macroeconomic outlook, firms reduce risk-taking at all levels of competition, and this is more significant for firms with high financial constraints. Furthermore, the impact of MEF is less on the capital structure selection of financially unconstrained firms (Korajczyk & Levy, 2003; Levy & Hennesy, 2007).

Hackbarth et al. (2006) investigated that since operating cash flows are dependent on the state of the economy, firms should adapt their policy decisions to the stage of the business cycle. Moreover, investment decisions are positively impacted by economic growth, financial development, and inflation rate while negatively impacted by foreign direct investment (Farooq et al., 2023).

The research by Cook and Tang (2010) documented that under a good MEF, firms become capable of adjusting their capital structure (leverage) with more alacrity toward their stipulated target. Chang et al. (2019) found that under unfavorable macro-economic environment, firms prefer to raise funds from equity due to increased financing constraints. Khyareh and Rostami (2022) argued that through macroeconomic stability, the beneficial effects of innovation on competitiveness can be strengthened. Wang et al. (2014) in their study revealed that cash holdings of firms decrease when inflation increases. However, once inflation attains its threshold point, firms' cash holdings rise along with inflation. Further, studies have shown that increases in economic activity as

<sup>1</sup> Source: <https://www.ibef.org/industry/manufacturing-sector-india>

indicated by GDP lead to better firm performance in Japan (Zeitun & Goaid, 2022). Killins (2020) explored the association between the GDP growth rate and the performance of Canadian life insurance companies demonstrating the relationship to be significant and positive. Al-Najjar (2014) documented the relationship between GDP growth and tourism firms' financial performance in Middle Eastern countries to be significantly positive.

It is evident from the literature that firm performance is impacted by macroeconomic factors in numerous ways. Issah and Antwi (2017) demonstrated that the effect of the GDP growth rate on business performance varies across industries. Further, this study advocated that the impact of macroeconomic factors may vary from economy to economy and that it also depends upon the proxy used to indicate the MEF. The aforementioned studies have documented that a positive macroeconomic environment influences firm characteristics positively and the GDP growth rate impacts the firm performance of developed economies positively. Thus, the MEF as indicated by the GDP growth rate is expected to have a direct bearing on the performance of enterprises.

Iqbal et al. (2020) defined a firm's financial constraints by its size. In this context, Ibhagui and Olokoyo (2018) stated that the performance of small enterprises is affected more on account of high leveraging; however, as businesses grow, these negative effects reduce and ultimately become nil when the firm size exceeds a particular threshold level. Moreover, it has been revealed that only small-size businesses benefit from gender diversity on the board measured in terms of improving performance (Li & Chen, 2018). The study by Mansour et al. (2023) found a positive effect of financing to be more significant on the market performance of large-size firms. Therefore, small-size firms are more sensitive to firm characteristics than large-size firms. Besides, research also reveals that small enterprises are relatively more constrained in financial terms than large-size firms due to their reputation, networking, and collateral available to them (Gertler & Gilchrist, 1994; Iqbal et al., 2020). Financial institutions may obtain sufficient information about larger businesses relatively easily, which lessens the degree of information asymmetry between lenders and

borrowers (Bernanke et al., 1996). This improves the availability of external financing to a greater extent (Rauh, 2006). According to Laghari and Chengang (2019), the high cost of external borrowings and credit rationing caused the desired working capital levels of financially restricted firms to be typically lower.

Thus, firm size can have both a direct and indirect impact on firm performance. Therefore, it is argued that large-size firms can render certain benefits in the form of easy accessibility to external financing primarily because of their networking and reputation. It is therefore probable that small-size enterprises' performance is more vulnerable to macroeconomic shifts than large-size ones.

Firms' financial constraints have also been defined by its age (Bakhtiari et al., 2020; Oliner & Rudebusch, 1992). Rossi (2016) argues that there have been mixed findings on firm age affecting its performance. Mature firms have an impact on performance through intermediary processes like routine and reputation (Coad et al., 2018). Foreign investors favor companies that have been operating for a longer period than start-ups or companies that are in their infancy (Mallinguh et al., 2020). Even though R&D activities decrease with corporate ageing (Loderer & Waelchli, 2009), such activities seem to be riskier for younger firms than mature firms (Coad et al., 2016).

Therefore, this study proposes that both mature and young firms have benefits and limitations, which can affect their performance in positive or negative ways. However, due to their reputation and experience, mature firms are preferred over young firms by investors. Moreover, young firms are faced with more financial constraints making it difficult for them to borrow from external markets which affects their cost of production, sales, and firm performance. MEF may play a more significant role in reducing financial constraints for young firms than mature firms. Consequently, the performance of young firms is more sensitive to macroeconomic changes than mature firms.

This study aims to empirically investigate the association between MEF and performance of firms along with the examination of firm size and age as moderators.

In light of the studies discussed, the following hypotheses are proposed:

- $H_1$ : Good macroeconomic factor improves firm performance.
- $H_2$ : The performance of small-size firms is relatively more sensitive to macroeconomic factors than large-size firms.
- $H_3$ : The performance of young firms is more sensitive to macroeconomic factors than mature firms.

2021-22. 673 firms with continuous data are identified for the period of 18 years of analysis making it 12,114 firm-year observations to assess the impact of the MEF on firm performance. 45 firm-year observations were identified as outliers, and so 12,069 firm-year observations were taken for the final analysis. Firm performance is identified as a dependent variable consisting of ROA (Lin & Fu, 2017) and ROE (Al-Najjar, 2014) as accounting-based measures, and Tobin's Q (Aggarwal et al., 2019) as a market-based measure. MEF is the main variable of interest, which is proxied by the annual GDP growth rate (Cook & Tang, 2010; Gupta & Mahakud, 2020). Further, the change in the GDP growth rate ( $\Delta$ GDP) and a dummy variable of MEF have been used as the robustness tests.

## 2. METHOD

The data used in this study are derived from the CMIE Prowess-IQ database. The yearly data are taken for analysis for the period of 2004-05 to

Leverage, firm size, liquidity, sales growth, firm age, cash flow from operations, tangibility, cash conversion cycle, research and development expenses, ex-

**Table 1.** Definition of variables

Variable type	Acronym	Description	Variable measurement/ definition
Dependent variable	ROA	Return on Assets	Profit after tax/ total assets
Dependent variable	ROE	Return on Equity	Profit after tax/ total equity
Dependent variable	Tobin's Q	Tobin's Q	(Total assets + market capitalization - net worth)/ total assets
Independent variable	MEF	Macroeconomic factor	Proxied by the annual GDP growth rate
Independent variable	$\Delta$ GDP	Annual change in GDP growth rate	Current year's GDP growth rate - previous year's GDP growth rate
Independent variable	DMEF	Dummy variable for macroeconomic factor	Value is 1 if the GDP growth rate is more than the median of the GDP growth rate, 0 otherwise
Control variable	FA	Firm age	Year of study – the year of incorporation
Control variable	LEV	Leverage	Total debt/ total assets
Control variable	FS	Firm size	Natural logarithm of total assets
Control variable	LIQ	Liquidity	Total cash/ total assets
Control variable	SG	Annual sales growth	(Current year sales/ Previous year sales) – 1
Control variable	CF	Cash flow from operations	Cash flow from operations/ total assets
Control variable	TAN	Tangibility	Fixed assets/ total assets
Control variable	E/S	Export-to-sales ratio	Total export/ Sales
Control variable	WC	Working capital	(Current assets- current liabilities)/ total assets
Control variable	CCC	Cash conversion cycle	Days inventory outstanding + days sales outstanding - days payables outstanding
Control variable	R&D	Research & development expenditure	Research & development expenditure/ sales
Control variable	Capex	Capital Expenditure	Capital expenditure/ sales
Control variable	Profit	Profit	Natural logarithm of profit
Control variable	OC	Ownership concentration	Promoters (in %) shares held
Control variable	Inf	Inflation rate	The rate that denotes an overall increase in the consumer price index.
Control variable	BR	Central bank interest rate	The rate of lending by the central bank to domestic banks.
Control variable	UR	Unemployment rate	The percentage of individuals without a job.
Control variable	ER	Exchange rate	The rate used to convert one currency into another. This study uses USD/INR.

port-to-sales ratio, working capital, capital expenditure and profit, ownership concentration, bank rate, inflation rate, unemployment rate and the exchange rate are taken as control variables.

Macroeconomic data, i.e., the GDP growth rate, bank rate, unemployment rate, inflation rate and the exchange rate, are retrieved from the official websites of Reserve Bank of India<sup>2</sup> and the World Bank (The World Bank, n.d.). In addition, the entire sample has been divided according to small-size firms and large-size firms and young firms and mature firms to compare how MEF affects the financial performance of these various types of firms. The division of firm size and age is done by calculating the median of the whole sample. A firm size having a higher value than or equal to the median size is considered a large-size firm otherwise, a small-size firm (Altaf & Ahmad, 2019). A firm age having a higher value than or equal to the median age is considered a mature firm otherwise a young firm (Tan & Tusha, 2023). Table 1 shows the description and measurements of the variables.

## 2.1. Methodology

The Wooldridge test and the Pesaran test confirm the existence of autocorrelation and cross-sectional dependency in the dataset. Therefore, the presence of heteroscedasticity and autocorrelation restricts this study from applying the pooled OLS or fixed effect, as argued by Baltagi (2008). Therefore, to address the endogeneity issue, a dynamic panel data model, i.e., two-step generalized method of moments (GMM) estimation that was developed by Arellano and Bond (1991), has been employed. The over-identifying restrictions are not found valid as per the Sargan test. Therefore, a two-step GMM with robust standard error has been used. The baseline estimation model is as follows:

$$\begin{aligned}
 FP_{i,t} = & \beta_0 + \beta_1 FP_{i,t-1} + \beta_2 MEC_t + \beta_3 FA_{i,t} + \\
 & + \beta_4 LEV_{i,t} + \beta_5 FS_{i,t} + \beta_6 LIQ_{i,t} + \beta_7 SG_{i,t} + \\
 & + \beta_8 CF_{i,t} + \beta_9 TAN_{i,t} + \beta_{10} EXTS_{i,t} + \beta_{11} WC_{i,t} + \quad (1) \\
 & + \beta_{12} CCC_{i,t} + \beta_{13} R \& D_{i,t} + \beta_{14} CAPEX_{i,t} + \\
 & + \beta_{15} PROF_{i,t} + Y_t + \delta_i + \varepsilon_{i,t}.
 \end{aligned}$$

Further, the second estimation model is as follows:

$$\begin{aligned}
 FP_{i,t} = & \beta_0 + \beta_1 FP_{i,t-1} + \beta_2 MEC_t + \beta_3 FA_{i,t} + \\
 & + \beta_4 LEV_{i,t} + \beta_5 FS_{i,t} + \beta_6 LIQ_{i,t} + \beta_7 SG_{i,t} + \\
 & + \beta_8 CF_{i,t} + \beta_9 TAN_{i,t} + \beta_{10} EXTS_{i,t} + \beta_{11} WC_{i,t} + \quad (2) \\
 & + \beta_{12} CCC_{i,t} + \beta_{13} R \& D_{i,t} + \beta_{14} CAPEX_{i,t} + \\
 & + \beta_{15} PROF_{i,t} + \beta_{16} OC_{i,t} + \beta_{17} INF_t + \beta_{18} BR_t + \\
 & + \beta_{19} UR_t + \beta_{20} ER_t + Y_t + \delta_i + \varepsilon_{i,t},
 \end{aligned}$$

where  $FP_{it}$  is the dependent variable, i.e., firm performance for firm  $i$  at period  $t$  represented by ROA, ROE or Tobin's Q,  $FP_{i,t-1}$  is the 1-year lag-dependent variable, i.e., either ROA, ROE or Tobin's Q;  $MEF_t$  is the macroeconomic factor,  $INF_t$  is the inflation rate,  $BR_t$  is the central bank interest rate,  $UR_t$  is the unemployment rate,  $ER_t$  is the exchange rate at period  $t$ ;  $FA_{i,t}$  is the firm age,  $LEV_{i,t}$  is the leverage,  $FS_{i,t}$  is the firm size,  $LIQ_{i,t}$  is the liquidity,  $SG_{i,t}$  is the sales growth,  $CF_{i,t}$  is the cash flow,  $TAN_{i,t}$  is the tangibility,  $EXTS_{i,t}$  is the export to sales ratio,  $WC_{i,t}$  is the working capital,  $CCC_{i,t}$  is the cash conversion cycle,  $R \& D_{i,t}$  is the research & development expenditure,  $CAPEX_{i,t}$  is the capital expenditure,  $PROF_{i,t}$  is the operating profit and  $OC_{i,t}$  is the ownership concentration for firm  $i$  at period  $t$ . In addition, the variable  $Y_t$  is a time dummy variable,  $\delta_i$  the firm's unobservable individual effects, and  $\varepsilon_{it}$  the random disturbance.

## 2.2. Descriptive statistics and VIF

Table 2 presents descriptive statistics of all the variables. The mean values for the dependent variables ROA, ROE and Tobin's Q for the selected sample are 0.05, 0.01 and 1.54, respectively. While the mean value for the independent variable, i.e., MEF (indicated by GDP growth rate), is 0.062, which indicates that the average GDP growth rate in the selected sample period is 6.2%, which implies that since the past 18 years, India is growing at an immense rate and hence is considered one of the rapidly advancing economies.

Table 3 presents the VIFs, which clearly shows that none of the VIF is higher than the threshold of 10 (Chatterjee & Hadi, 2012), indicating that there is no multicollinearity among the variables.

2 Source: <https://dbieold.rbi.org.in/DBIE/dbie.rbi?site=home>

**Table 2.** Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
ROA	12,069	0.05	0.07	-0.68	1.16
ROE	12,069	0.1	0.33	-9.5	3.39
Tobin's Q	12,069	1.54	1.43	0.02	22.2
MEF	12,069	0.062	0.03	-0.07	0.09
FA	12,069	37.99	19.83	18	159
LEV	12,069	0.27	0.19	0	1.44
FS	12,069	8.14	1.9	2.5	16.1
LIQ	12,069	0.002	0.01	0	0.13
SG	12,069	0.17	1.22	-0.97	71.63
CF	12,069	0.08	0.1	-1.75	2.24
TAN	12,069	0.33	0.16	0.001	0.87
E/S	12,069	0.16	0.24	0	1
WC	12,069	0.12	0.18	-1.25	0.9
CCC	12,069	23.85	70.71	-922.82	905.66
R&D	12,069	0.004	0.01	0	0.26
Capex	12,069	0.06	0.12	0	2.97
Profit	12,069	5.47	2.82	-11.89	13.28
OC	12,069	0.55	0.15	0	1
Inf	12,069	0.07	0.03	0.03	0.12
BR	12,069	0.08	0.02	0.04	0.09
UR	12,069	0.06	0.01	0.05	0.08
ER	12,069	58.32	12.05	41.29	78.55

**Table 3.** VIF

Variable	VIF	Variable	VIF
MEF	1.28	CCC	1.23
FA	1.24	R&D	1.09
FS	2.49	Capex	1.13
LEV	1.68	Profit	2.07
LIQ	1.06	OC	1.02
SG	1.02	Inf	2.07
CF	1.16	BR	9.00
TAN	1.5	UR	2.27
E/S	1.09	ER	5.53
WC	1.98		

### 3. RESULTS

Table 4 presents the results for firm performance measured using ROA, ROE, and Tobin's Q. The significant and positive coefficient of MEF confirms the first hypothesis ( $H_1$ ) implying that when an economy grows at a high rate, the performance of the firm also improves. The result is statistically significant at a 5% level of significance on ROA and ROE, and at a 1% level of significance on Tobin's Q. Coefficient is highest on Tobin's Q (i.e., 1.79) followed by ROE (i.e., 0.11) and ROA (i.e., 0.03). This suggests that if MEF increases by 1%, the performance of firms will increase by 1.79%, 0.11% and 0.03% when measured by Tobin's Q,

ROE, and ROA, respectively. In addition, the empirical findings show that sales growth and profits have a significant and positive effect, while tangibility and leverage have a significant and negative effect on firm performance.

A robustness test is conducted by controlling the ownership concentration and macroeconomic variables as shown in equation 2. Table 5 reports the results for the same. Further, the findings remain more or less the same on all the three proxies of firm performance. The ownership concentration, inflation rate, bank rate and exchange rate are found to influence at least one of the proxies. The baseline results are consistent with after con-

**Table 4.** Baseline regression

Variable	ROA	ROE	Tobin's Q
FP <sub>it-1</sub>	0.38*** (12.8)	0.17* (1.77)	0.32*** (7.0)
MEF	0.03** (2.42)	0.11** (2.27)	1.79*** (6.17)
FA	-0.01** (-2.18)	-0.01*** (-5.49)	0.09*** (6.06)
LEV	-0.10*** (-7.0)	-0.32*** (-4.74)	-0.12 (-0.66)
FS	-0.01 (-0.91)	0.03 (1.5)	-0.65*** (-5.09)
LIQ	0.03 (0.24)	-0.20 (-0.23)	1.06 (0.5)
SG	0.01*** (2.87)	0.01** (2.11)	0.01 (0.88)
TAN	-0.08*** (-5.98)	-0.18*** (-3.08)	-0.43** (-2.54)
Profit	0.01*** (8.83)	0.05*** (8.22)	0.01** (2.08)
Other firm controls	Yes	Yes	Yes
AR2	0.61	0.79	0.9

Note: (i) \*\*\*, \*\*, and \* are significant at 1%, 5% and 10% levels respectively. (ii) Other firm control variables such as cash flow, export to sales, working capital, cash conversion cycle, research & development expenditure and capital expenditure are suppressed for brevity. (iii) The z-statistics are reported in parentheses. (iv) AR2 denotes the p-values of the second-order serial correlation test utilizing residuals of initial differences, which are asymptotically distributed as N(0,1).

trolling for ownership concentration and macroeconomic variables.

The second objective determines whether MEF has an impact on firm performance across the firm size. Equation 2 is used to estimate the effect. The results from Table 6 show that the performance of both large and small firms is positively impacted by MEF. For large-size firms, the coefficient of MEF on ROA (i.e., 0.06), Tobin's Q (i.e., 1.34) and ROE (i.e., 0.14) is statistically significant at 1%, 5% and 10% significance levels, respectively. The results for small-size firms show that the coefficient of MEF on ROA (i.e., 0.08), ROE (i.e., 0.21) and Tobin's Q (i.e., 2.67) is statistically significant

at the 1% significance level. Thus, the performance of small-size firms is impacted by MEF by a higher degree as compared to large-size confirming the second hypothesis ( $H_2$ ).

The final objective explores if MEF affects firm performance across its age. Equation 2 is used to estimate the effect. The results from Table 7 report that the performance of both mature and young firms is positively impacted by MEF. For mature firms, the coefficient of MEF on ROA (i.e., 0.03) and ROE (i.e., 0.11) is statistically significant at the 10% significance level and Tobin's Q (i.e., 1.15) at the 1% level of significance. The results for young firms show that the coefficient of MEF on ROA

**Table 5.** Robustness test controlling ownership concentration and macroeconomic variables

Variable	ROA	ROE	Tobin's Q
FP <sub>it-1</sub>	0.37*** (12.36)	0.16* (1.66)	0.30*** (5.81)
MEF	0.04** (2.28)	0.12** (2.11)	1.14*** (3.31)
FA	0.0004 (0.43)	-0.01*** (-2.57)	0.13*** (6.42)
LEV	-0.1*** (-6.9)	-0.3*** (-4.5)	-0.07 (-0.35)
FS	-0.01 (-0.97)	0.04 (1.56)	-0.71*** (-4.51)
LIQ	0.04 (0.29)	-0.05 (-0.06)	-0.73 (-0.29)
SG	0.01*** (2.7)	0.01** (1.99)	0.02 (0.81)
TAN	-0.08*** (-5.94)	-0.18*** (-3.22)	-0.37** (-2.02)
Profit	0.01*** (8.67)	0.05*** (8.18)	0.01* (1.8)
Other firm controls	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes
AR2	0.64	0.77	0.64

Note: (i) \*\*\*, \*\*, and \* are significant at 1%, 5% and 10% levels respectively. (ii) Other firm control variables such as cash flow, export to sales, working capital, cash conversion cycle, research & development expenditure, capital expenditure; ownership concentration; macroeconomic control variables such as central bank interest rate, inflation rate, unemployment rate and exchange rate are suppressed for brevity. (iii) The z-statistics are reported in parentheses. (iv) AR2 denotes the p-values of the second-order serial correlation test utilizing residuals of initial differences, which are asymptotically distributed as N(0,1).



**Table 6.** Large-size firms and small-size firms

Variables	Large-size firms			Small-size firms		
	ROA	ROE	Tobin's Q	ROA	ROE	Tobin's Q
FP <sub><i>t-1</i></sub>	0.35*** (8.0)	0.11 (1.42)	0.3*** (4.71)	0.43*** (10.46)	0.34*** (7.16)	0.37*** (4.77)
MEF	0.06*** (2.7)	0.14* (1.89)	1.34** (2.55)	0.08*** (3.15)	0.21*** (3.82)	2.67*** (8.31)
FA	0.0003 (0.35)	-0.003 (-0.42)	0.04*** (2.62)	0.002*** (3.03)	0.004** (2.21)	-0.003 (-0.29)
LEV	-0.11*** (-4.44)	-0.57*** (-3.61)	-0.59* (-1.7)	-0.08*** (-4.96)	-0.20*** (-4.1)	0.01 (0.03)
LIQ	0.47** (2.09)	-0.25 (-0.17)	1.33 (0.28)	0.03 (0.16)	-0.24 (-0.62)	2.8 (1.33)
SG	0.03*** (3.03)	0.06** (2.3)	0.05 (0.88)	0.01*** (2.64)	0.01 (1.63)	-0.01 (-1.48)
TAN	-0.06*** (-3.22)	-0.07 (-0.5)	-0.56* (-1.8)	-0.11*** (-5.82)	-0.28*** (-5.75)	-0.44** (-2.35)
Other firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
AR2	0.74	0.9	0.51	0.37	0.12	0.74

Note: (i) \*\*\*, \*\*, and \* are significant at 1%, 5% and 10% levels, respectively. (ii) Other firm control variables such as cash flow, export to sales, working capital, cash conversion cycle, research & development expenditure, capital expenditure; ownership concentration; macroeconomic control variables such as central bank interest rate, unemployment rate and exchange rate are suppressed for brevity. (iii) The z-statistics are reported in parentheses. (iv) AR2 denotes the p-values of the second-order serial correlation test utilizing residuals of initial differences, which are asymptotically distributed as N(0,1).

(i.e., 0.11), ROE (i.e., 0.32) and Tobin's Q (i.e., 3.91) is statistically significant at the 1% level of significance. Therefore, the findings reveal that young firms experience a more pronounced impact of MEF on their performance than mature firms, confirming the third hypothesis ( $H_3$ ).

This study performs an additional test to check the robustness of the baseline findings. For this, two different crisis periods, the sub-prime crisis of 2008 and the COVID-19 pandemic are controlled by excluding the financial years of 2007-08, 2008-09, 2020-21, and 2021-22 from the sample. Hence, the duration of this study is limited to 14 years. The results from Table 8 show that the findings remain more or less the same for accounting-based measures while the results are different for the mar-

ket-based measure. In the main analysis, Tobin's Q is found to be highly significant statistically at the 1% significance level. While in the additional analysis where crisis period is excluded, MEF becomes statistically insignificant. Therefore, it can be inferred from here that crisis periods do affect the performance of firms, especially when it is measured using a market-based measure as investors are likely to react more to adverse situations.

## 4. DISCUSSION

The baseline finding shows that favorable economic factors impact firm performance positively, which implies the better the state of the economy, the better will be the firm performance. This can

**Table 7.** Mature firms and young firms

Variables	Mature firms			Young firms		
	ROA	ROE	Tobin's Q	ROA	ROE	Tobin's Q
FP <sub><i>t-1</i></sub>	0.34*** (7.52)	0.06 (0.59)	0.3*** (5.84)	0.43*** (10.62)	0.29*** (4.14)	0.23*** (4.8)
MEF	0.03* (1.67)	0.11* (1.74)	1.15*** (2.66)	0.11*** (4.38)	0.32*** (3.67)	3.91*** (8.31)
FS	0.003 (0.47)	0.05 (1.57)	-0.55*** (-4.27)	0.004 (0.81)	0.02 (1.29)	-0.28*** (-4.11)
LEV	-0.11*** (-3.99)	-0.43*** (-3.59)	-0.07 (-0.29)	-0.12*** (-7.76)	-0.26*** (-4.78)	-0.45** (-2.44)
LIQ	0.16 (1.01)	-1.42 (-0.48)	-2.71 (-0.63)	-0.05 (-0.23)	-0.04 (-0.09)	0.78 (0.39)
SG	0.02** (2.31)	0.04** (2.0)	0.03 (0.68)	0.01** (2.11)	0.03* (1.71)	0.003 (0.11)
TAN	-0.08*** (-3.9)	-0.13 (-1.63)	-0.85*** (-3)	-0.07*** (-3.93)	-0.25*** (-4.55)	-0.18 (-1.08)
Other firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes
AR2	0.26	0.47	0.27	0.16	0.12	0.11

Note: (i) \*\*\*, \*\*, and \* are significant at 1%, 5% and 10% levels respectively. (ii) Other firm control variables such as cash flow, export to sales, working capital, cash conversion cycle, research & development expenditure, capital expenditure; ownership concentration; macroeconomic control variables such as central bank interest rate, unemployment rate and exchange rate are suppressed for brevity. (iii) The z-statistics are reported in parentheses. (iv) AR2 denotes the p-values of the second-order serial correlation test utilizing residuals of initial differences, which are asymptotically distributed as N(0,1).

**Table 8.** Controlling crisis period

Variable	ROA	ROE	Tobin's Q
FP <sub>it-1</sub>	0.45*** (10.6)	0.16 (1.42)	0.52*** (5.18)
MEF	0.37*** (4.09)	1.51*** (5.3)	0.09 (0.11)
FA	-0.0001 (-0.16)	-0.01 (-1.09)	-0.07*** (-3.93)
FS	-0.05*** (-3.51)	0.05* (1.74)	-0.43*** (-4.21)
LEV	-0.002 (-0.39)	-0.29 (-3.58)	0.02 (0.12)
LIQ	0.1 (0.63)	-0.14 (-0.3)	3.72* (1.75)
SG	0.01*** (2.91)	0.01 (1.36)	0.01 (0.55)
TAN	-0.08*** (-5.82)	-0.14** (-2.26)	-0.21 (-1.09)
Profit	0.01*** (6.8)	0.03*** (5.9)	0.01** (2.32)
Other firm controls	Yes	Yes	Yes
Macroeconomic controls	Yes	Yes	Yes
AR2	0.85	0.38	0.32

Note: (i) \*\*\*, \*\*, and \* are significant at 1%, 5% and 10% levels respectively. (ii) Other firm control variables such as cash flow, export to sales, working capital, cash conversion cycle, research & development expenditure, capital expenditure; ownership concentration; macroeconomic control variables such as central bank interest rate are reported in parentheses. (iv) AR2 denotes the p-values of the second-order serial correlation test utilizing residuals of initial differences, which are asymptotically distributed as  $N(0,1)$ .

be attributed to numerous reasons. Firstly, under favorable MEF, firms have better access to funds in the financial markets at a lower cost. Consequently, the production costs improve, which in turn encourages firms to increase their capital expenditures, which enhances production, sales and ultimately profits. Secondly, during a good MEF, both domestic and foreign investors are motivated to invest more and save less, which increases the scope of financing. Hence, firms can easily borrow from the external sources reducing the financial constraints and paving the way for firms to improve through their development projects. This also eventually improves performance. The results provide evidence to show that firm performance is impacted positively under favorable MEF. This result is similar to prior research by Killins (2020) and is in sync with  $H_1$ .

Since the findings indicate that MEF and firm performance have a positive relationship, therefore, managers should monitor MEF on an ongoing basis so that proactive steps can be taken in anticipation of any adverse MEF. Further, lenders and investors can also review the MEF to ensure the security of their funds before providing finance. Finally, policymakers can advise the government on policy measures to tide over adverse MEF.

This study also finds the positive impact of sales growth and profits on firm performance, implying that any increase in yearly sales and operating profits will contribute to the enhancement of firm per-

formance. Since sales and operating profits constitute firms' net return, it is expected to have a direct relationship with firm performance. Contrary to this, tangibility and leverage carry a negative influence on the performance of firms inferring that any increase in fixed assets and external borrowings will lower firm performance. The expenses of purchasing tangible assets and increased financing costs of raising debt brings down the companies' financials and performance. These results are in alignment with prior studies by Altaf and Ahmad (2019), Ibhagui and Olokoyo (2018), Iqbal et al. (2020), and Mansour et al. (2023). Therefore, managers need to focus more on maximizing sales and operating profits and raise debt and increase their fixed assets only when needed.

The findings of the second objective document the performance of small-size firms to be more impacted by the MEF. Small-size firms face the problem of financial constraints due to their size, lack of collateral, low reputation and networking which does not hold true for large-size firms. Thus, the impact on small-size firms is greater than on large-size firms. Thus, the results are in sync with  $H_2$ . Thus, managers of small-size firms are required to focus on MEF together with lending agencies and investors to ensure availability of funds.

The results also reveal the effect of MEF to be more pronounced for young firms. Similar to small-size firms, young firms are more prone to financial constraints, while similar to large-size firms, mature

firms get more access due to the factors mentioned above. The findings from this are in sync with  $H_3$ .

The findings also show that the impact of MEF on market performance is more when compared to accounting performance, which is similar to prior research by Iqbal et al. (2020). Hence, it can be inferred that market reactions are strong for all types of firms irrespective of their size and age, possibly because investors expect a decline in the performance of all types of firms during a bad MEF. Since investors' confidence

may be negatively affected during an adverse MEF, this could lead to a fall in market capitalization and hence, Tobin's Q.

The results show that financially constrained firms, as defined by their size and age, are more prone to be affected by MEF as compared to firms with better risk appetite and financial muscle. Moreover, the performance of these firms is likely to be impacted by a greater degree in times of both favorable and adverse factors. Thus, stakeholders need to assess the impact of MEF on these firms.

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## CONCLUSION

This study investigates the effect of the macroeconomic factor on the performance of Indian manufacturing firms. Further, the research is extended to analyze the degree to which macroeconomic factors affect the performance of small-size and large-size firms and mature and young firms. Return on assets, return on equity and Tobin's Q are used as the proxies for firm performance, and the annual gross domestic product growth rate is identified for macroeconomic factors. The empirical findings using a two-step generalized method of moments demonstrate that under good macroeconomic factor, businesses perform better and vice versa implying that adverse macroeconomic situations increases firms' financing constraints, which in turn affects the production, sales, profitability, and performance. Besides, small-size firms and young firms have been observed to be more affected by macroeconomic factor.

This study suggests the management, lending institutions and investors need to monitor the state of the economy to tap investment opportunities during favorable economic situations and adopt a conservative approach during adverse economic situations. Management can alter their strategic plans in accordance with prevailing macro factor and anticipated changes thereon. Regulatory agencies can adopt flexible measures in their policies to mitigate any detrimental impact on firms' financials during uncertain or adverse macro situations. The study's limitation is that only manufacturing companies are considered for analysis and that too for a specific economy, India. Hence, the future scope of this study is that financial firms can also be included coupled with a cross-country study that may provide new insights. Further, the moderating role of other firm-specific variables can also be examined in the context of firm performance.

## AUTHOR CONTRIBUTIONS

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