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Competition risk and stock returns: Indian evidence

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Abstract

Purpose – This study examines the relationship between competition risk and stock returns in the Indian market by utilizing the Marginal Cost to Average Cost (MCAC) ratio, a firm-level competition measure introduced by Taussig (2021). The study investigates whether cost efficiency, driven by competitive pressures, influences stock performance.

Design/methodology/approach – The study employs portfolio-sorting techniques and Fama-MacBeth cross-sectional regressions to analyze the relationship between MCAC and future stock returns. Firms are sorted into decile portfolios based on MCAC, and their subsequent equal-weighted (EW) and value-weighted (VW) returns are assessed using CAPM, Fama-French three-factor and Carhart four-factor models. The robustness of findings is tested through dual sorting on market power and examining different firm sizes to determine whether the effect is driven by small stocks.

Findings – The results indicate that firms with lower MCAC (higher cost efficiency) earn higher future stock returns, while firms with higher MCAC (cost pressure and inefficiency) underperform. Additionally, the findings suggest that the MCAC effect is distinct from market power effects, as efficiency appears to drive the return premium rather than monopoly power.

Practical implications – The study highlights the importance of cost structure in investment decision-making, suggesting that investors can use MCAC as a screening metric to identify firms with superior cost efficiency and higher expected returns. Moreover, the findings emphasize that competitive markets do not necessarily lead to higher risk premiums, but instead reward firms that achieve operational efficiency under competition.

Originality/value – This study contributes to the literature by providing first empirical evidence from an emerging market (India) on the relationship between MCAC and stock returns. Unlike prior research that focuses on industry concentration as a competition measure, this study introduces a firm-level competition risk proxy and demonstrates that cost efficiency, rather than monopoly power, drives excess stock returns.

Keywords Competition risk, MCAC, Stock returns, Cost efficiency, Emerging markets, Asset pricing

Paper type Research paper

1. Introduction

Understanding the relationship between risk and return is a cornerstone of asset pricing. Classic models such as the Capital Asset Pricing Model (CAPM) (Sharpe, 1964; Lintner, 1965) and multi-factor extensions (e.g. Fama and French, 1993) posit that higher risk should be compensated by higher expected returns. However, numerous anomalies challenge these models, prompting the search for new risk factors beyond the traditional market beta. One such avenue of inquiry examines product market competition as a source of priced risk. Firms generate cash flows through product-market activities, and the competitive environment can influence both the volatility and the growth of these cash flows. As a result, competition risk –

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the uncertainty in a firm's cash flows due to its competitive landscape – may be reflected in stock returns (Hou and Robinson, 2006).

If competition introduces systematic risk that cannot be diversified away, rational investors in an efficient market will demand a return premium for bearing this risk. On the other hand, if competition primarily affects idiosyncratic or unsystematic factors (or if markets are inefficient in processing this information), the relationship may manifest as an anomalous return pattern exploitable by investors. Understanding which of these perspectives holds is particularly important in emerging markets like India, where market structures and informational efficiencies may differ from developed markets.

This study examines the relationship between competition risk and stock returns in the Indian market by utilizing the Marginal Cost to Average Cost (MCAC) ratio, a firm-level competition measure introduced by Taussig (2021). The study investigates whether cost efficiency, driven by competitive pressures, influences stock performance. This study explores the notion that the intensity of competition faced by a firm is an important determinant of its risk-return trade-off. We focus on the Indian context, an emerging economy that has undergone significant liberalization and regulatory changes over the past few decades. Economic reforms (especially post-1991 liberalization) and the establishment of the Competition Commission of India (under the Competition Act, 2002) have progressively increased market competition in many industries. These macroeconomic and policy shifts provide a unique backdrop to examine competition risk. For instance, during high-growth periods in India, new entrants and aggressive expansion can heighten competition, whereas in downturns, weaker firms may exit, altering the competitive balance. Such dynamics suggest that competition risk may interact with broader macroeconomic conditions – amplifying distress in recessions and fueling innovation during booms – consistent with theoretical predictions (e.g. Aguerrevere's, 2009) real options model of competition under business cycles). By situating our analysis in India, we also account for potentially different investor behaviors and market structures (e.g. prevalence of family business groups, emerging market regulations, and varying levels of market efficiency) that could influence how competition translates into risk premia.

The remainder of the paper is organized as follows. Section 2 develops the theoretical framework linking competition risk to expected stock returns, drawing on industrial organization theory, market efficiency considerations, and the risk-return trade-off. Section 3 reviews the empirical literature on competition risk and stock returns, highlighting global evidence and positioning our contribution. Section 4 describes the data and methodology, including the construction of the competition risk proxy (MCAC). Section 5 presents the results, and Section 6 discusses the findings in light of theory and cross-country evidence. Section 7 concludes with implications and suggestions for future research.

2. Theoretical framework

In economic theory, competition is a multifaceted concept with important implications for firm profitability, strategic behavior, and risk. Industrial organization (IO) theory traditionally views competition at the industry level and often measures it via market structure indicators such as the number of firms, concentration ratios, or the Herfindahl-Hirschman Index (HHI). A highly concentrated industry (few competitors) typically affords incumbent firms greater pricing power and more stable profits, whereas a highly competitive industry (many rivals, low concentration) can erode profit margins through price wars and share battles. From a risk perspective, Hou and Robinson (2006) identified two channels through which competition can affect expected returns:

Creative Destruction Risk: In intensely competitive industries, firms must continuously innovate and take strategic risks to survive. This dynamic is analogous to the Schumpeterian notion of *creative destruction*, where innovation by one firm can render others obsolete. Schumpeter (1942) emphasized that competition driven by innovation "strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives," unleashing a process of continuous industrial mutation. In such an environment, even successful firms face an ever-present threat of being displaced by new technologies or entrants – a risk that is systematic if economy-wide innovation cycles influence many firms. Investors may therefore demand higher returns for firms in these competitive, innovation-driven settings as compensation for this creative destruction risk. Indeed, Schumpeter argued that this process of continuous innovation and replacement is what drives economic progress, but it comes hand-in-hand with greater uncertainty for incumbents.

Distress Risk: In contrast, firms in concentrated industries (oligopoly or monopoly) enjoy market power and typically face less threat of sudden failure. Their cash flows may be more stable due to higher margins and barriers to entry that protect them from competition. This relative stability implies lower systematic risk – often translating to lower expected returns. In Hou and Robinson's framework, low competition (high concentration) environments have an absence of the creative destruction threat, so investors accept lower returns for such firms.

Hou and Robinson's seminal work formalized these ideas by showing that, in U.*S. data*, firms in industries with intense competition (low concentration) earned higher average stock returns than those in more monopolistic industries, even after controlling for standard risk factors. This finding supports the risk-return trade-off: intense competition adds systematic risk (through innovation uncertainty and potential distress), which the market prices in the form of higher expected returns (a competition risk premium). It is an intuitively appealing extension of market efficiency – if competition risk matters, efficient markets should incorporate it into asset prices, and we observe higher returns as compensation.

Beyond the Industrial Organization perspective, other theoretical lenses provide additional insight into how competition influences firm performance and risk. Resource-Based View (RBV) theory (Barney, 1986) suggests that a firm's sustainable competitive advantage (and by extension, its ability to earn above-normal returns) hinges on owning valuable, rare, and inimitable resources. Competition, in this view, is a race to build and protect such resources. Firms that successfully shield their unique resources from imitation can maintain high profitability even in competitive markets, whereas those without such moats will see their profits driven down by rivals. RBV implies that competition risk is tied to how easily competitors can erode a firm's advantages; firms with well-protected resources may experience less earnings volatility (lower risk) despite competitive pressure, whereas firms in commodity-like businesses are highly exposed.

Porter's (1980) competitive strategy framework complements this by highlighting mechanisms of rivalry: price competition, advertising battles, new product introductions, and other tactics. Intense rivalry on any of these fronts can squeeze margins and force firms to become more efficient or innovative. If a firm competes primarily on price in a crowded market, its margins (and hence internal cash flows) will be under constant pressure – a risk factor for investors if such margin compression is correlated with broader economic conditions. Alternatively, competition through innovation or marketing (non-price competition) might affect risk in different ways, perhaps by creating more idiosyncratic outcomes (product success vs. failure) that could increase firm-specific volatility.

Another important dimension is cost structure and real options under competition. When competition increases, firms often must invest in efficiency and innovation just to keep up. This can be viewed through a real options theory lens: firms have options to expand, contract, or abandon projects depending on market conditions. In highly competitive markets, the option to wait or delay investment might be less valuable – waiting could mean a rival gains first-mover advantage. As a result, firms may undertake investments earlier or more aggressively, which increases their exposure to economic shocks. Aguerrevere (2009) developed a real options model showing that the competition–return relationship can depend on the macroeconomic cycle. For example, during economic downturns, firms in very competitive industries might continue investing or undercutting prices to survive (amplifying losses and risk), whereas in booms, even firms in concentrated industries might engage in risky expansion. Real options theory thus suggests that competition can alter a firm's risk profile by changing the timing and nature of its investment decisions. When firms operate in a competitive environment, they have to exercise growth or contraction options in a less leisurely manner, which can increase systematic risk if many firms are driven by the same competitive pressures.

Crucially, competition's impact on risk is intertwined with its impact on profitability. In perfect competition, economic theory holds that in the long run, firms earn zero economic profits (price equals marginal cost equals average cost). As competition intensifies, any above-normal profits are competed away. This has two implications: (1) Profitability effect – firms in highly competitive markets might have lower current profits, but those that manage to stay efficient can grow or capture market share, potentially leading to future profit upside; (2) Efficiency effect – competition forces efficiency improvements, and firms that achieve them can maintain or even improve margins relative to less efficient rivals. These factors can influence returns: If investors value efficiency and future growth potential, they might bid up efficient (low-cost) firms, yielding higher returns for those firms. Conversely, firms that fail to remain efficient may suffer stock price declines (lower returns) due to deteriorating profits. In this sense, competition risk can operate through a risk premium channel (higher required returns for riskier competitive environments) and a profitability/efficiency channel (higher realized returns for firms that thrive under competition).

In summary, the theoretical expectation is that competition affects the risk-return trade-off through multiple channels. Intense competition can raise systematic risk – via *Schumpeterian* creative destruction and compressed margins requiring a risk premium– but it can also drive efficiency and innovation, which determine long-run profitability. The net effect on stock returns is thus an empirical question that may depend on which effect dominates and the context (e.g. nature of competition, macro conditions, firm strategy). In emerging markets like India, where some industries are rapidly growing and others are consolidating, competition risk may manifest differently across sectors and over time. For instance, industries with low barriers to entry (few regulatory hurdles, low capital requirements) likely experience more frequent entry of new competitors, pressuring incumbents' profits and raising uncertainty. Meanwhile, industries with significant economies of scale can give an incumbent cost advantages that deter entrants. If an incumbent achieves large scale, its lower unit costs allow it to price more aggressively or enjoy higher margins, which can reinforce its market position and potentially yield superior stock performance (as long as the market recognizes the value of this efficiency). Thus, cost efficiency gained under competitive pressure can be a source of excess returns – a concept we directly test using the MCAC measure.

3. Literature review

Empirical research on competition and stock returns has grown in the past 2 decades, producing mixed results across different markets. Early studies in the United States established competition as a potential risk factor. Hou and Robinson (2006), in a seminal study covering 1973–2001, found that firms in industries with intense competition (measured by low industry concentration) earned higher average stock returns than those in concentrated industries. Even after controlling for size, book-to-market, and momentum, this competition effect persisted, suggesting the market demands a risk premium for exposure to highly competitive environments. In their interpretation, investors require higher returns for firms subject to the twin risks of creative destruction and competitive distress. Sharma (2011) extended this analysis by examining multiple proxies of competition in the U.S. (1973–2006), including HHI, a Lerner index (pricing power proxy), and industry size. Sharma found that regardless of the proxy, greater competition consistently correlated with higher subsequent returns, reinforcing the idea that monopoly-like firms enjoy steady but lower returns whereas firms in competitive markets face risks that drive up expected returns. These U.S. findings imply a relatively unified message: competition risk is priced – competition tends to depress current profits but increase required returns.

However, evidence from other markets has not always aligned with the U.S. experience. In an Australian setting, Gallagher *et al*. (2015) reported that concentrated industries (i.e. less competition) exhibited higher risk-adjusted returns, the opposite of the U.S. pattern. They hypothesized that in Australia's market, dominant firms in concentrated industries were often those investing heavily in R&D and innovation, which boosted their future profitability and stock performance. In other words, the profitability channel (rather than the risk channel) dominated in that context: firms with market power could convert that advantage into innovation and profit growth, yielding superior returns. Similarly, a study in the U.K. by Mouselli and Jaafar (2019) (replicating Hou and Robinson's approach for 1991–2007) found that firms in high-concentration industries earned higher stock returns, contradicting the U.S. evidence. On the other hand, another U.K. study by Hashem and Su (2015) found results more consistent with Hou and Robinson, indicating that even within the same country (the UK), different samples or time periods can produce different competition–return relationships. Meanwhile, Mazali (2017), examining Brazil, found no significant relationship between industry concentration and stock returns, underscoring that the competition effect can be muted or obscured in certain contexts (perhaps due to Brazil's market characteristics or data limitations). Cross-country comparisons suggest that market structure and investor behavior differ in ways that affect the pricing of competition risk. Factors such as the typical firm size, industry composition (e.g. resource-driven economies versus diversified economies), and investor focus on growth vs. stability could lead to these divergent findings.

Recognizing that industry concentration is a blunt measure, some researchers have turned to firm-level and alternative competition metrics. For example, Gaspar and Massa (2006) showed that more competitive industries are associated with higher firm-specific return volatility, linking competition to idiosyncratic risk (which could translate to return if investors are not fully diversified or if that risk contains a systematic component). Li *et al*. (2013) developed a text-based measure of competition by analyzing the language in firms' 10-K filings, reflecting management's perception of competitive threats. Their work highlights that competition has qualitative aspects (e.g. product substitutability, as indicated by *cross-elasticity of demand*) that may not be captured by concentration ratios alone.

More recently, Taussig (2021) proposed the MCAC (Marginal Cost to Average Cost) ratio as a direct firm-level proxy for competition. The intuition behind MCAC is rooted in the economics of perfect competition: in a long-run competitive equilibrium, price = marginal cost = average cost, so MCAC = 1 (or 0 in log terms). If a firm's marginal cost is well above its average cost (MCAC >1), it might indicate diseconomies of scale or cost pressures, possibly due to an inability to pass on costs – consistent with a highly competitive environment where firms lack pricing power. Conversely, MCAC <1 could indicate economies of scale or cost advantages, suggesting the firm has achieved efficiency (perhaps due to large scale or superior processes) that rivals have not, which could be a sign of competitive strength. Taussig examined over 100,000 U.S. firm-year observations (1963–2019) and found that firms with higher MCAC (cost ratios far above 1) had lower subsequent stock returns, whereas those with low MCAC (close to or below 1) had higher future returns. In Fama-MacBeth regressions, MCAC had a significantly negative coefficient, implying that cost-inefficient firms underperformed in the stock market. This result appears at first to contrast with Hou and Robinson (who found competition → higher returns), but the key is the interpretation: MCAC is picking up a competition-driven cost efficiency dimension. A high MCAC might reflect a firm under intense competitive pressure that is raising its costs (or unable to reduce costs) – essentially a firm that is struggling in a competitive sense – and investors anticipate its difficulties, leading to lower returns. On the other hand, a low MCAC firm has managed to produce at low marginal cost relative to its historical average costs, indicating high efficiency (potentially due to scale or operational excellence). Such efficiency can be rewarded by investors, as it translates to better profitability and growth prospects, consistent with the idea of a "profitability premium" in stock returns (see also Novy-Marx, 2013; on gross profitability driving returns).

Several recent studies (2020–2024) further enrich the understanding of competition risk in asset pricing. Jory and Ngo (2017) took a nuanced view by examining product market power (the inverse of competition) at the firm level. They found that U.S. firms with the greatest pricing power (i.e. strong market power, measured by markups or dominance) achieved significantly higher buy-and-hold abnormal returns than those with weak market power, even after controlling for industry concentration and other characteristics. The authors attribute this to an expected profitability effect: firms with strong market power had higher future earnings surprises and lower idiosyncratic volatility, which investors rewarded with higher valuations. This stands in contrast to Hou and Robinson's risk-based interpretation and suggests that in some cases, what looks like a competition effect on returns may actually be capturing differences in expected profitability (with more dominant firms delivering positive earnings shocks). In the Indian context, Kaicker and Aggarwal (2023) provided evidence that aligns more with the risk-based view: they found that Indian firms in more concentrated industries (i.e. less competition) tend to earn lower subsequent stock returns, and this effect was especially pronounced for firms that rely on non-price competition strategies like advertising. The implication is that when a few firms dominate an industry (especially via brand power or marketing muscle rather than price), their future returns are relatively subdued – possibly due to complacency or simply lower risk – whereas firms in competitive industries can achieve higher returns by continuously striving for efficiency and innovation. Another study by Le *et al*. (2023) found that across global markets, firms in competitive industries (low concentration) earn higher expected returns than those in concentrated industries, reaffirming the competition risk premium in general. Intriguingly, they also reported that advertising intensity is negatively associated with returns, but only in highly competitive industries. This suggests an interaction: in competitive markets, heavy advertising might be a sign of desperate rivalry and an expense that drags on returns, whereas in monopolistic markets advertising helps entrench market power and doesn't hurt returns as much. A recent study by Ahmed *et al*. (2023) shows that product market competition can *moderate* other well-known return predictors. For instance, they find that the positive relation between labor mobility (employee turnover flexibility) and future stock returns is amplified in more competitive industries. This indicates that competition's role in asset pricing is an active area of research: competition can interact with factors like human capital, innovation, or financial flexibility to shape the risk-return profile of firms.

Overall, the empirical literature suggests that competition risk is a nuanced and context-dependent factor. The key findings of the literature is summarized below:

(1) In U.S. markets, competition (low industry concentration) generally correlates with higher returns, supporting a risk premium interpretation (Hou and Robinson, 2006; Sharma, 2011).

(2) In some other developed markets like Australia and parts of Europe, researchers have observed the opposite or mixed results – with higher returns for firms in concentrated industries (Gallagher *et al*., 2015; Mouselli and Jaafar, 2019) or no clear effect (Mazali, 2017). These cases often point to a profitability-driven story where market leaders convert their dominance into shareholder returns.

(3) Firm-level measures (e.g. markups, MCAC) have revealed that the competition-return relationship might manifest through operational efficiency: firms that handle competition well (maintaining low costs or high markups) tend to perform better. (Taussig, 2021)

(4) Emerging markets (e.g. India, Brazil) have started to yield evidence largely consistent with the notion that competition influences returns, but results can vary by industry and the nature of competition (price vs. non-price). For India, initial evidence (Kaicker and Aggarwal, 2023) aligns with the risk premium view (monopolistic industries gave lower returns). Our study adds to this by examining a cost-based competition metric at the firm level.

Considering these studies, it is evident that the effect of competition on stock returns is mixed and inconclusive overall. The discrepancies across markets highlight the importance of how competition is measured and the underlying economic context. They also underscore a dual perspective: in many cases, intense competition is associated with higher subsequent returns, consistent with a risk premium for competitive pressure; but under certain conditions (specific countries, time periods, or when examining firm-level competitive advantages), strong market power can also yield high returns via superior profitability. This dual risk-vs-profitability interpretation is important to keep in mind as we turn to the Indian market analysis. Our work aims to contribute to this debate by using the MCAC measure in India, thereby providing evidence from a large emerging economy that has features of both intense competition in some sectors and lingering concentration in others.

4. Data and methodology

Data: Our sample consists of firms listed on Indian stock exchanges from 1997 through 2023. We exclude financial and utility firms due to their distinct regulatory environments and accounting norms. The data on stock prices (to compute returns) and accounting variables (to compute MCAC and other firm characteristics) are obtained from the Centre for Monitoring Indian Economy (CMIE) Prowess database. Data pertaining to Cost of Goods Sold (COGS), Total Sales, General and Administrative Expenses, Year of incorporation (for age), monthly stock prices, market capitalization for size and computing the value-weighted returns, book to market ratio were obtained. The initial sample includes all non-financial, non-utility firms with available data; firms with missing key variables are dropped, yielding a final sample of 1,813 companies. Firm entry and exit are handled by including all available firm-year observations – this avoids survivorship bias by not requiring firms to be present for the entire sample. Notably, the computation of MCAC requires at least five years of historical cost data; therefore, for a newly listed firm, MCAC can be computed only after it has accumulated five years of COGS history. Until then, that firm is not assigned an MCAC value and is excluded from MCAC-sorted analysis for those early years.

According to Taussig (2021), the phenomenon of firms entering or exiting the market is not observed in a perfectly competitive market structure over an extended period. This phenomenon arises when the average costs are equivalent to both the product price and the marginal costs, i.e. P = MC = AC. Moreover, it is observed that all costs exhibit fluctuations over an extended period. As the product market becomes increasingly competitive and marginal costs approach average costs, it is expected that profits will decline. Market competition decreases when the marginal costs surpass the average costs. The proposed measure of product market competition by Taussig (2021) is based on the division of marginal costs by average costs. This newly introduced metric, referred to as MCAC, is formally described as:

Measuring Competition Risk (MCAC): We adopt the MCAC (Marginal Cost to Average Cost) measure introduced by Taussig (2021) as our primary competition risk proxy. For firm *i* in year *t*, we define:

$$MCAC_{i,t} = Ln\left(\frac{MC_{it}}{AC_{it}}\right) \tag{1}$$

Where MC_{it} is the firm *i*'s marginal cost, proxied by the cost of goods sold (COGS) in year *t* and AC_{it} is the firm's average cost, defined as the average COGS over the past five years (years t-1 through t-5). We take the natural log to normalize the ratio. Intuitively, if a firm's recent one-year cost is higher than its long-run average cost (MCAC >0 after log), it may be experiencing cost increases or diseconomies of scale (higher competition risk). If recent cost is lower than the long-run average (MCAC <0), it suggests improving efficiency (lower competition risk). A value of MCAC = 0 implies MC = AC, consistent with a long-run equilibrium in a competitive market.

We also consider an alternative augmented MCAC measure that includes not just COGS but also Selling, General and Administrative (SG&A) expenses in both the marginal and average cost calculations. This accounts for a broader notion of operating costs, though our primary focus remains on the COGS-based MCAC for consistency with prior work.

We employ two main empirical approaches to link MCAC with stock returns:

Portfolio Formation (Fama and French, 1993 method): Following the tradition of Fama and French (1993) and Hou and Robinson (2006), we form portfolios based on the prior year's MCAC values to see how future returns vary across different levels of competition risk. At the end of each June (aligning with the Indian fiscal year end of March, and allowing for accounting data availability), we sort all sample firms into deciles based on their MCAC for the most recent year. Decile 1 contains the 10% of firms with the lowest MCAC (i.e. firms closest to the perfect competition benchmark or with the greatest cost efficiency – low competition risk by this proxy), while Decile 10 contains the 10% with the highest MCAC (firms with the greatest cost pressures – high competition risk).

We then calculate the equal-weighted and value-weighted (weighted by market capitalization) average stock returns for each decile portfolio over the subsequent year (July of year *t* through June of *t+1*). We also compute the portfolios' alphas with respect to standard asset pricing models: the CAPM, the Fama-French three-factor model (market, size, value factors), and the Carhart four-factor model (adding momentum). Regressions of the following forms were estimated to evaluate the risk-adjusted performance of the portfolios:

$$R_{p,t} = \alpha + \beta_1 (R_{m,t} - rf_t) + \varepsilon_{p,t} \tag{2}$$

$$R_{p,t} = \alpha + \beta_1 (R_{m,t} - rf_t) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{p,t} \tag{3}$$

$$R_{p,t} = \alpha + \beta_1 (R_{m,t} - rf_t) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 WML_t + \varepsilon_{p,t} \tag{4}$$

Where R_{pt} is the portfolio return in time *t* which is month in our case, R_{mt} is market return, rf_t is the risk-free rate, SMB is the size factor, HML is the value factor, WML is the momentum factor, and ε is the error term. The data pertaining to the factors were sourced from the data repository of Agarwalla *et al.* (2014).

This approach allows us to assess whether there is a monotonic relationship between MCAC and future returns and whether any such relationship is explained by known risk factors or represents an abnormal return pattern. If competition risk is priced, we would expect the high competition risk portfolio (high MCAC) to earn higher returns than the low MCAC portfolio, yielding a positive spread (Decile 10 minus Decile 1) in returns. If instead competition risk operates via a profitability or efficiency channel, we might see the opposite – more efficient firms (low MCAC) outperform, giving a negative Decile 10 minus Decile 1 spread.

Fama-MacBeth Cross-Sectional Regressions: We also implement two-step Fama-MacBeth regressions (Fama and MacBeth, 1973) to formally test the relationship between MCAC and future returns while controlling for other firm characteristics. In each month, we regress individual stock returns on the firms' MCAC (from the previous fiscal year) and control variables such as firm size proxied by market capitalization, book-to-market ratio, momentum (return over t-2 to t-12), reversal (return in the previous month), and firm age. The typical regression at time *t* is:

$$R_{i.t+1} = \alpha_t + \beta_1 MCAC_{i.t} + \beta_2 X_{i.t} + \varepsilon_{i,t} \tag{5}$$

where $R_{i,t+1}$ is the subsequent return for stock *i*, $MCAC_{i,t}$ is the competition risk measure, and $X_{i,t}$ represents a vector of control variables. We then average the slope estimates *betas* over time and compute Newey-West adjusted *t*-statistics, as per the Fama-MacBeth procedure. This two-step approach provides an estimate of the "price" of competition risk in the cross-section – specifically, β_1 indicates whether MCAC has a consistent effect on future returns across periods.

We then average the regression coefficients over time and evaluate their significance using the time-series standard errors of the monthly estimates. This method provides an estimate of the price of competition risk in the cross-section. A significantly positive coefficient on MCAC would indicate that higher MCAC (higher competition risk) is associated with higher expected returns (consistent with a risk premium). A significantly negative coefficient would indicate that higher competition risk predicts *lower* returns, consistent with a different interpretation (e.g. investors favor firms that are more efficient, or competition risk is not rewarded). We report the average regression coefficients and t-statistics (adjusted with Newey-West standard errors for autocorrelation) to assess significance.

5. Results

Table 1 presents summary statistics for the key variables. The MCAC (log ratio) for Indian firms has a mean close to zero (−0.01 in our sample) with substantial dispersion – the standard deviation is about 0.47, and the full range is broad (e.g. some firms have MCAC above 1 in log terms, meaning their marginal cost is ~2.7 times their average cost, while others have negative values indicating substantially lower marginal cost than historical average). This variation in MCAC suggests heterogeneity in competitive conditions and cost structures across firms. Size (log market cap) and book-to-market also show typical variation, with the sample including a wide range of firm sizes and value/growth profiles.

Portfolio Sorts: Figure 1 and Table 2 summarize the performance of MCAC-sorted portfolios. We find a near monotonic pattern: portfolios of firms with lower MCAC consistently earn higher average returns than those with higher MCAC. For example, over the full sample, the low-MCAC Decile 1 portfolio earns an average monthly return of 1.84%, whereas the high-MCAC Decile 10 portfolio earns only 0.89% per month on average. The difference (low minus high) is statistically significant ($t = 3.22$).

This return spread remains significant after adjusting for standard risk factors. The equal-weighted Decile 1 minus Decile 10 spread has a CAPM alpha of approximately 0.93% per month (t-stat ~ 3.25), suggesting that even after adjusting for market risk, cost-efficient firms continue to outperform cost-inefficient firms. Similarly, the equal-weighted Decile 1 minus Decile 10 spread has a three-factor alpha of about 0.68% per month (t-stat ~ 2.58), indicating that even after controlling for market, size, and value effects, the cost-efficient firms outperform cost-inefficient firms. The four-factor alpha (including momentum) is slightly reduced but still significant (at 10% level), suggesting that the MCAC effect is not merely a hidden momentum or value effect. These results imply a negative price of competition risk as measured by MCAC – i.e. firms with high competition-induced cost pressures underperform, and firms with high efficiency (low MCAC) outperform. This is the opposite of what a simple risk-premium story (à la Hou and Robinson) would predict, but it is consistent with MCAC capturing a profitability/efficiency factor. In essence, investors are rewarding firms that have

Table 1. Descriptive statistics

	Mean	STD	Max	Min	N
MCAC	0.99	0.47	13.48	−2.81	379,704
Size	8.24	2.25	16.70	0.65	256,212
BM	−0.36	1.15	4.61	−6.87	241,272

Note(s): This table shows the descriptive statistics of the key variables used in this study: MCAC, size, and Book-to-market ratio. The sample period is July 2002 to June 2023
Source(s): Authors' own work

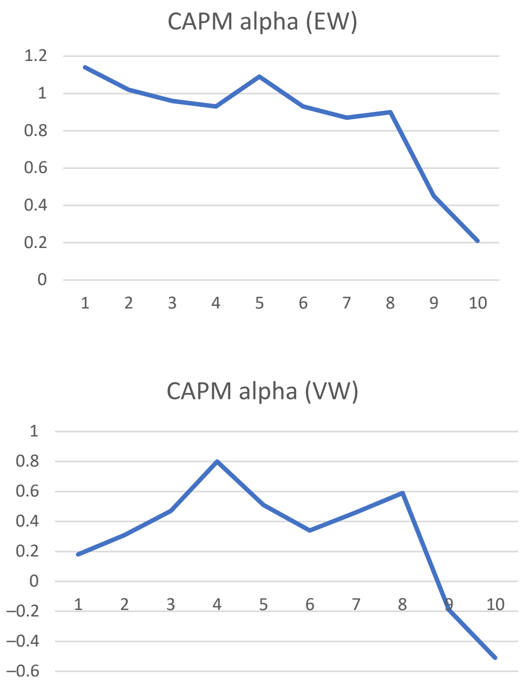

Figure 1. Performance of MCAC decile portfolios-The figures show the CAPM alphas of both EW and VW portfolios formed on the MCAC decile portfolios. Source: Authors' own work

lower costs (and likely higher margins), despite those being in competitive markets, which points to an efficiency premium.

To ensure robustness, we also looked at value-weighted portfolio returns. The value-weighted results show a similar pattern, though slightly less pronounced (as larger firms, which dominate value-weighted portfolios, tend to have more average MCAC and slightly lower spreads). Over the full sample period, the low-MCAC Decile 1 portfolio earns an average monthly return of 0.50%, while the high-MCAC Decile 10 portfolio earns −0.21% per month on average. The return spread between the two portfolios (low minus high) is 0.71% per month, but it is not statistically significant ($t = 1.86$). Similarly, the risk-adjusted alphas are also not statistically significant.

The presence of the effect in the equal-weighted portfolio but its absence in the value-weighted portfolio suggests that the effect is primarily driven by small stocks. Since equal-weighted returns assign greater weight to smaller firms, the observed pattern indicates that the relationship between MCAC and returns is more pronounced among smaller companies. Nevertheless, the low-minus-high MCAC portfolio returns are positive but not statistically significant for value weights, indicating the effect may be driven by small firms.

Modified MCAC: Following Taussig (2021), this study incorporates a modified MCAC measure by including Sales, General and Administrative (SGA) expenses alongside Cost of Goods Sold (COGS). The portfolio formation methodology is employed to examine the relationship between modified MCAC and subsequent stock returns, with results presented in Table 3.

Both equal-weighted (EW) and value-weighted (VW) returns are calculated by forming decile portfolios. The findings indicate that the most competitive portfolio (Decile 1) generates the highest and statistically significant EW returns (mean return: 1.77%, t-stat = 2.21; CAPM

Table 2. MCAC sorted portfolios and subsequent stock returns

Decile	EW portfolios Mean return	CAPM alpha	FF alpha	FFC	VW portfolios Mean return	CAPM alpha	FF alpha	FFC	Average MCAC (%)
1	1.84**	1.14**	0.74***	0.90***	0.50	0.18	0.05	0.21	−86.11
	(2.34)	(2.61)	(3.03)	(3.49)	(1.11)	(0.57)	(0.17)	(0.79)	
2	1.68**	1.02***	0.70***	0.84***	0.74	0.31	0.14	0.41	−7.23
	(2.34)	(2.88)	(4.73)	(5.64)	(1.36)	(0.84)	(0.48)	(1.28)	
3	1.61**	0.96***	0.77***	0.87***	0.95	0.47*	0.35*	0.56***	6.70
	(2.42)	(3.25)	(5.20)	(6.69)	(1.72)	(1.77)	(1.71)	(2.62)	
4	1.54**	0.93***	0.76***	0.84***	1.16**	0.80**	0.67**	0.65*	14.52
	(2.33)	(3.36)	(4.66)	(5.58)	(2.38)	(2.16)	(2.13)	(1.91)	
5	1.70**	1.09***	0.95***	1.09***	0.83*	0.51	0.37	0.28	20.92
	(2.64)	(3.93)	(7.08)	(9.39)	(1.87)	(1.51)	(0.18)	(0.92)	
6	1.58***	0.93***	0.82***	1.03***	0.77*	0.34	0.36	0.71**	27.35
	(2.36)	(3.62)	(6.64)	(8.89)	(1.76)	(1.44)	(1.47)	(2.74)	
7	1.53**	0.87***	0.75***	0.97***	0.88*	0.46	0.54	0.98***	34.87
	(2.25)	(3.24)	(5.08)	(7.48)	(1.75)	(1.27)	(1.62)	(3.02)	
8	1.56***	0.90***	0.77***	1.06***	1.00*	0.59	0.61*	0.69**	45.73
	(2.14)	(3.38)	(5.61)	(7.71)	(1.71)	(1.52)	(1.75)	(2.13)	
9	1.15***	0.45	0.33**	0.63***	0.20	−0.19	−0.19	0.20	66.03
	(1.55)	(1.61)	(1.98)	(4.48)	(0.39)	(−0.63)	(−0.68)	(0.74)	
10	0.89	0.21	0.12	0.42*	−0.21	−0.51*	−0.44	−0.16	125.68
	(1.22)	(0.61)	(0.54)	(1.93)	(−0.49)	(−1.83)	(−1.66)	(−0.51)	
1–10	0.95***	0.93***	0.68**	0.48*	0.71	0.69*	0.48	0.37	
	(3.22)	(3.25)	(2.58)	(1.88)	(1.86)	(1.88)	(1.48)	(1.00)	

Note(s): Decile portfolios are formed each year from July 2002 to June 2023 by sorting stocks based on the MCAC estimated in the past year. MCAC = LN (marginal cost/average cost) is defined as a natural logarithm of firm's last year's cost of goods sold divided by average cost of goods sold in the past five years. Portfolio 1(10) is the portfolio with lowest (highest) MCAC over the past quarter. The table reports the equal-weighted (EW) and value-weighted (VW) average monthly returns, CAPM, three-factor and four-factor alphas of the MCAC decile portfolios. The last row presents the difference between the average returns of portfolios 10 and 1, CAPM, 3-factor and 4-factor alphas of the difference and their corresponding Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10%
Source(s): Authors' own work

alpha: 1.08%, *t*-stat = 2.31; FF3 alpha: 0.74%, *t*-stat = 2.63; FFC alpha: 0.92%, *t*-stat = 3.05). In contrast, portfolios with high MCAC exhibit lower returns (mean return: 0.97%; CAPM: 0.28%; FF3: 0.16%; FFC: 0.49%).

The difference portfolio (Decile 10 – Decile 1) confirms a significant return spread (mean return: 0.80%, *t*-stat = 2.28; CAPM alpha: 0.80%, *t*-stat = 2.33; FF3 alpha: 0.58%, *t*-stat = 1.96; FFC alpha: 0.43%, *t*-stat = 1.36).

These findings suggest that incorporating SGA expenses into MCAC does not alter the core results, reaffirming a statistically significant relationship between modified MCAC and subsequent stock returns. Furthermore, similar to the original MCAC, the effect of modified MCAC appears to be most pronounced in the tails of the distribution.

Cross-Sectional Regressions: The Fama-MacBeth regression results in Table 4 reinforce the portfolio findings. The average slope on MCAC in predicting next-month returns is negative and statistically insignificant. In our full regression model, which includes size, book-to-market, reversal, momentum, and age controls, the coefficient on MCAC is approximately −0.70 (*t*-statistic ∼ −3.27, indicating significance at the 1% level). This suggests that a one-unit increase in the MCAC ratio (e.g. going from 0 to 1 in log terms, meaning a substantial rise in marginal vs. average cost) is associated with a 0.70% lower expected monthly return, holding other factors constant. In annualized terms, this translates to roughly a 8.2% reduction in expected return for a large increase in competition risk.

Table 3. Modified MCAC and subsequent stock returns

Decile	EW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	VW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	Average MCAC (%)
1	1.77**	1.08**	0.74**	0.92***	1.71**	1.24**	1.15**	1.03**	−72.5
	(2.21)	(2.31)	(2.63)	(3.05)	(2.42)	(2.64)	(2.75)	(2.64)	
2	1.75**	1.09***	0.75***	0.85***	1.04**	0.65*	0.45	0.66**	−6.6
	(2.42)	(3.04)	(4.48)	(5.00)	(2.07)	(1.90)	(1.72)	(2.22)	
3	1.87**	1.22***	0.99***	1.06***	0.85*	0.51	0.34	0.56**	6.3
	(2.66)	(3.72)	(5.62)	(6.72)	(1.80)	(1.50)	(1.28)	(2.18)	
4	1.54**	0.92***	0.77**	0.85***	1.23**	0.76**	0.71**	0.82**	13.6
	(2.34)	(3.39)	(5.48)	(6.51)	(2.10)	(2.11)	(2.19)	(2.45)	
5	1.58**	0.98***	0.82***	0.96***	1.29**	0.99**	0.88**	0.99***	19.2
	(2.66)	(3.19)	(4.76)	(5.85)	(2.38)	(2.30)	(2.52)	(2.94)	
6	1.62**	1.01***	0.91***	1.07***	0.74	0.42	0.31	0.17	24.5
	(2.55)	(4.05)	(6.89)	(8.40)	(1.58)	(1.18)	(0.96)	(0.45)	
7	1.59**	0.94***	0.83***	1.00***	0.84	0.38	0.42	0.79**	30.4
	(2.29)	(3.26)	(5.23)	(7.15)	(1.36)	(1.10)	(1.28)	(2.23)	
8	1.51**	0.84**	0.68***	0.88***	0.69	0.28	0.16	0.73**	37.8
	(2.14)	(2.82)	(4.01)	(5.25)	(1.21)	(0.75)	(0.47)	(2.43)	
9	1.23	0.55	0.37**	0.67***	0.37	−0.05	−0.61	0.33	49.8
	(1.66)	(1.91)	(2.34)	(4.58)	(0.67)	(−0.13)	(−0.19)	(1.07)	
10	0.97	0.28	0.16	0.49***	0.54	0.26	0.22	0.27	83.8
	(1.32)	(0.90)	(0.75)	(2.44)	(1.02)	(0.57)	(0.52)	(0.56)	
1–10	0.80**	0.80**	0.58*	0.43	1.17*	0.97	(0.93)	0.76	
	(2.28)	(2.33)	(1.96)	(1.36)	(1.74)	(1.62)	(1.57)	(1.22)	

Note(s): Decile portfolios are formed each year from July 2002 to March 2023 by sorting stocks based on the MCAC estimated in the past year. MCAC = LN (marginal cost/average cost) is defined as a natural logarithm of firm's last year's cost of goods sold plus selling, general and administrative expenditure (SGA) divided by average cost of goods sold plus selling, general and administrative expenditures in the past five years. Portfolio 1 (10) is the portfolio with lowest (highest) MCAC over the past quarter. The table reports the equal-weighted (EW) and value-weighted (VW) average monthly returns, CAPM, three-factor and four-factor alphas of the MCAC decile portfolios. The last row presents the difference between the average returns of portfolios 10 and 1, CAPM, 3-factor and 4-factor alphas of the difference and their corresponding Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10%
Source(s): Authors' own work

Table 4. Average slopes (*t*-statistics) from month-to-month regressions of stock returns on MCAC, size, BM, past performance, and age

MCAC	Ln (MC)	Ln (BM)	R (0.1)	R (2.12)	Ln (A)
−0.082 (−0.35)					
−0.66** (−2.50)	−0.28** (−2.79)				
−0.68*** (−3.20)	−0.26*** (−3.18)	0.02 (0.20)			
−0.70*** (−3.27)	−0.26*** (−3.13)	0.07 (0.63)	−0.03*** (−3.50)	0.01 (0.34)	0.11 (1.34)

Note(s): This table reports average slopes (*t*-statistics) from month-by-month regression of stock returns on MCAC, size, BM, past performance and age. MCAC = LN (marginal cost/average cost) which is defined by the natural logarithm of company's cost of goods sold of year t−1 divided by average cost of goods sold in the past five years. (t−1, t−2, t−3, t−4, t−5). Size is the natural logarithm of market capitalization. BM is the natural logarithm of 1/price-to-book ratio. Past performance R (0.1) is return of t-1 month, and R (2.12) is the average of past 12 months and past 2 months. Ln(A) is the natural logarithm of age of company. The sample is from July 2002 to June 2023. Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10% respectively
Source(s): Authors' own work

We also experiment with the augmented MCAC (including SG&A costs) and find very similar results in Table 5: firms with higher total cost (COGS + SGA) to average cost ratios also have lower future returns. This indicates that it is truly the overall cost efficiency (as opposed to just production efficiency) that investors are pricing.

Market power and MCAC: To discern and isolate the impact of market power, which prior literature has linked to firm performance (e.g. Hou and Robinson, 2006), we constructed dual-sorted portfolios (2×3) to mitigate the influence of market power. We employed two key metrics to measure market power: (1) Sales and (2) Gross Profitability Ratio (Sales−COGS)/Sales. The results indicate that the difference in mean returns between high and low MCAC portfolios is statistically significant in the equally-weighted portfolios, regardless of whether firms exhibit high or low market power. However, in value-weighted portfolios, this return difference is not statistically significant, potentially reflecting a size effect. As noted by Aziz and Ansari (2017), anomalies tend to be more pronounced among smaller stocks, which aligns with our findings. Tables 6 and 7 further demonstrate that low-MCAC portfolios consistently outperform high-MCAC portfolios across both high and low market power firms. However, the Fama-French and Carhart alpha of the return spread is not statistically significant, suggesting that the observed return differentials may be explained by common risk factors. Overall, these findings suggest that the MCAC effect is distinct from the market power effect, indicating that competition risk influences returns independently of market power considerations.

6. Discussion

Our findings provide a nuanced perspective on competition risk and stock returns in the Indian market. On the face of it, the negative relationship between MCAC and future returns indicates that Indian firms with higher marginal-to-average cost ratios (i.e. those under greater cost pressure, presumably from competition or inefficiency) tend to underperform, while firms with low ratios (efficient operators) tend to outperform. This result is consistent with Taussig (2021), who reported a similar negative MCAC–return association for U.S. firms. Both in the U.S. and India, it appears that cost efficiency (which can reflect an ability to withstand competition) is rewarded by investors. This aligns with the broader idea of a profitability or quality premium in stock returns: firms that manage their costs well and remain profitable in the face of competition deliver superior returns to shareholders. In our case, MCAC effectively captures an aspect of operational efficiency under competitive conditions, so one interpretation is that we are observing a "competitive efficiency premium."

Table 5. Modified MCAC and stock returns

MCAC	Ln (MC)	Ln (BM)	R (0.1)	R (2.12)	Ln (Age)
−0.07 (−0.52)					
-0.42^{***} (−3.01)	-0.30^{***} (−3.07)				
-0.40^{***} (−3.52)	-0.24^{***} (−2.94)	0.92 (0.80)			
-0.40^{***}(−3.45)	-0.25^{***} (−2.98)	0.12 (1.00)	-0.03^{***} (−3.66)	0.01 (0.25)	0.21^{**} (2.37)

Note(s): This table reports average slopes (*t*-statistics) from month-by-month regression of stock returns on MCAC, size, BM, past performance and age. MCAC = LN (marginal cost/average cost) which is defined by the natural logarithm of company's cost of goods sold plus sales, general and administrative expense of year t-1 divided by average cost of goods sold plus sales, general and administrative expense in the past five years. (t−1, t−2, t−3, t−4, t−5). Size is the natural logarithm of market capitalization. BM is the natural logarithm of 1/price-to-book ratio. Past performance R (0.1) is return of t−1 month, and R (2.12) is the average of past 12 months and past 2 months. Ln(A) is the natural logarithm of age of company. The sample is from July 2002 to June 2023. Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10% respectively
Source(s): Authors' own work

Table 6. Double-sorted portfolios on sales and MCAC

	EW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	VW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	Average MCAC (%)
Portfolios (low sales)									
1	1.59**	0.95***	0.68***	0.81***	0.98*	0.51*	0.36**	0.51***	−26.89
	(2.32)	(2.64)	(3.41)	(3.84)	(1.85)	(1.75)	(2.04)	(3.11)	
2	1.55**	0.93***	0.79***	0.98***	1.43**	0.85***	0.85***	1.11***	24.37
	(2.34)	(3.42)	(5.22)	(6.72)	(2.20)	(3.19)	(3.60)	(4.61)	
3	1.23*	0.57*	0.43**	0.74***	0.57	0.21	0.12	0.16	72.95
	(1.78)	(1.96)	(2.47)	(4.87)	(1.38)	(0.85)	(0.51)	(0.63)	
H-L	−0.36*	−0.38**	−0.26	−0.07	−0.39	−0.29	−0.24	−0.35	
	(−1.93)	(−1.99)	(−1.48)	(−0.41)	(−1.16)	(−0.93)	(−0.86)	(−1.21)	
Portfolios (High sales)									
1	1.65**	1.00***	0.72***	0.84***	0.80	0.36	0.22	0.47**	−20.73
	(2.35)	(2.96)	(4.99)	(5.88)	(1.51)	(1.29)	(1.04)	(2.00)	
2	1.55**	0.91***	0.77***	0.95***	1.05**	0.73**	0.62**	0.66**	23.47
	(2.34)	(3.44)	(6.14)	(8.76)	(2.45)	(2.47)	(2.52)	(2.34)	
3	1.19*	0.53*	0.40***	0.71***	0.52	0.19	0.23	0.50*	70.75
	(1.68)	(1.91)	(3.04)	(5.97)	(1.10)	(0.63)	(0.83)	(1.79)	
H-L	−0.46***	−0.47***	−0.32**	−0.13	−0.31	−0.17	0.01	0.03	
	(−2.66)	(−2.72)	(−2.16)	(−0.85)	(−0.99)	(−0.55)	(0.01)	(0.09)	

Note(s): Portfolios are formed each year from June 2002 to March 2023 by dividing the sample into high and low sales stocks and sorting stocks based on the MCAC estimated in the past year. MCAC = LN (marginal cost/average cost) is defined as a natural logarithm of firm's last year's cost of goods sold divided by average cost of goods sold in the past five years. Portfolio 1(3) is the portfolio with lowest (highest) MCAC over the past quarter. The table reports the equal-weighted (EW) and value-weighted (VW) average monthly returns, CAPM, three-factor and four-factor alphas of the MCAC decile portfolios. The last row presents the difference between the average returns of portfolios 3 and 1, CAPM, 3-factor and 4-factor alphas of the difference and their corresponding Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10%
Source(s): Authors' own work

Table 7. Double-sorted portfolios on gross margin and MCAC

	EW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	VW portfolios Mean return	CAPM alpha	FF alpha	Carhart's alpha	Average MCAC (%)
Portfolios (low margin)									
1	1.67**	0.99***	0.69***	0.81***	0.55	0.17	0.07	0.19	−23.20
	(2.29)	(2.82)	(4.09)	(4.89)	(1.08)	(0.45)	(0.23)	(0.58)	
2	1.70**	1.06***	0.92***	1.09***	0.54	0.31	0.16	0.30	23.82
	(2.48)	(3.85)	(6.57)	(8.11)	(1.37)	(0.98)	(0.61)	(0.96)	
3	1.22*	0.54*	0.38**	0.64***	0.27	−0.05	0.01	0.09	73.09
	(1.66)	(1.74)	(2.57)	(4.31)	(0.60)	(−0.20)	(0.06)	(0.33)	
H-L	−0.44**	−0.45**	−0.32	−0.17	−0.31	−0.22	−0.05	−0.10	
	(−2.23)	(−2.26)	(−1.62)	(−0.83)	(−0.79)	(−0.56)	(−0.14)	(−0.25)	
Portfolios (High margin)									
1	1.66***	1.01***	0.75***	0.87***	0.86	0.42	0.24	0.43*	*−20.84*
	(2.39)	(3.01)	(4.85)	(5.61)	(1.61)	(1.42)	(1.06)	(1.76)	
2	1.49**	0.87***	0.75***	0.93***	1.27***	0.88***	0.80***	0.89***	25.11
	(2.30)	(3.37)	(5.09)	(7.06)	(2.67)	(2.91)	(3.08)	(3.52)	
3	1.23*	0.57**	0.47**	0.79***	0.58	0.25	0.27	0.59**	73.23
	(1.74)	(2.12)	(2.73)	(5.14)	(1.17)	(0.71)	(0.84)	(2.31)	
H-L	−0.42**	−0.44**	−0.28	−0.08	−0.28	−0.17	0.03	0.17	
	(−1.97)	(−2.08)	(−1.57)	(−0.40)	(−0.78)	(−0.48)	(0.07)	(0.51)	

Note(s): Portfolios are formed each month from July 2002 to March 2023 by dividing the sample into high and low values of (Sales-COGS)/Sales and sorting stocks based on the MCAC estimated in the past year. MCAC = LN (marginal cost/average cost) is defined as a natural logarithm of firm's last year's cost of goods sold divided by average cost of goods sold in the past five years. Portfolio 1(3) is the portfolio with lowest (highest) MCAC over the past quarter. The table reports the equal-weighted (EW) and value-weighted (VW) average monthly returns, CAPM, three-factor and four-factor alphas of the MCAC decile portfolios. The last row presents the difference between the average returns of portfolios 3 and 1, CAPM, 3-factor and 4-factor alphas of the difference and their corresponding Newey and West (1987) adjusted *t*-statistics. *, **, *** represents significance at 1, 5 and 10%

Source(s): Authors' own work

Figure 2 show the efficiency channel through which a lower MCAC can impact he stock returns. Competition arises from the joint dynamics of revenue and costs, where a lower or higher MCAC reflects expanding or contracting margins, respectively. A lower MCAC typically signals expanding margins, suggesting improved profitability and a strong future outlook, which in turn leads to higher expected stock returns. Conversely, a higher MCAC may indicate shrinking margins, reflecting deteriorating profitability and weaker future performance, resulting in lower expected stock returns.

A lower MCAC (where Marginal COGS is lower than Average COGS) can result from several factors, including economies of scale, lower input prices, technology upgrades, operational efficiencies, supplier renegotiation, and more cost-effective manufacturing techniques. These improvements allow firms to reduce costs, increase profit margins, and enhance competitiveness, which can contribute to higher stock returns. On the other hand, a higher MCAC (where Marginal COGS exceeds Average COGS) may be driven by rising input costs, capacity constraints, quality control issues, fluctuating demand, and supply chain disruptions such as transportation delays or shortages of key raw materials. Such factors can pressure margins, reduce profitability, and lead to lower expected returns.

Additionally, firms exhibiting cost efficiency may also be assuming innovation risk by incurring high R&D expenditures. This could be a potential channel through which higher expected returns materialize, suggesting that firms investing in efficiency gains may also be investing in innovation-driven growth. Future research could explore whether R&D intensity plays a subsuming role in explaining the MCAC-return relationship and whether firms that maintain low MCAC are also those with high innovation-driven competitive advantages.

Furthermore, industry-level analysis may provide deeper insights, as the impact of MCAC on returns could vary across different sectors. A key open question remains whether the MCAC effect is primarily driven by firm-specific characteristics, such as operational efficiency, or industry-wide factors, such as market concentration. This relationship is also dynamic, as efficient firms may gradually evolve into dominant industry players over time. Firms experiencing gains in efficiency might leverage their cost advantages to achieve greater market power, reinforcing their competitive positioning within the industry and potentially influencing long-term stock returns.

Our results align with the view of Kaicker and Aggarwal (2023) for India, who reported that industries with higher concentration (less competition) had lower future returns. This is effectively the flip side of our finding: their evidence at the industry level suggests competitive industries outperform, which is consistent with our finding that within those industries, the efficient firms do particularly well. Both findings reinforce that the Indian market, like the U.S., seems to place a premium on competitive pressure – but realized through efficiency gains. On the other hand, our findings diverge from the Australian evidence by Gallagher *et al.* (2015), where industry concentration was associated with *higher* returns. In Australia's case, as noted, large firms used their market power to invest in R&D, yielding innovation-driven growth. In India, the scenario may differ; large dominant firms (often former public sector monopolies or family conglomerates) might not always innovate to the same extent, and they can become complacent, leading to lower returns as competition slowly erodes their turf. Meanwhile, upstart or efficient firms in competitive markets (think of India's fast-moving consumer goods or tech sectors) are agile and can capture market share, rewarding investors. Thus, differences in market structure and competitive strategy likely explain the cross-country discrepancies. In markets where market leaders aggressively innovate (perhaps due to investor pressure or culture, as might be in Australia or certain UK cases), market power can coincide with high returns. In markets where competition spurs the challengers more than the

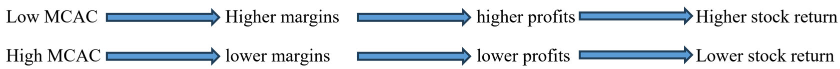

Figure 2. The efficiency channel of MCAC. Source: Authors' own work

incumbents, we see competition associated with higher returns for the efficient challengers – which is what our India results suggest.

From a policy perspective, our findings highlight an interesting point: competition, *per se*, is not detrimental to investor outcomes – in fact, competitive markets can yield strong stock returns, provided firms adapt. There might be a tendency to assume that investors prefer monopolies due to their stable profits. While monopolistic firms indeed have lower risk, their returns can also be lower (since much of the success is already priced in and they face the risk of complacency). Our evidence that competitive pressure correlates with higher returns (via efficiency) suggests that policies promoting healthy competition (antitrust enforcement, reducing entry barriers, encouraging innovation) could actually benefit investors in the long run by creating a more dynamic corporate sector where the *fittest* (most efficient) firms thrive and deliver value. It also means that managers of firms cannot rest easy even if they have an initial advantage – continuous improvement is key, which is essentially the Schumpeterian competition narrative in action.

7. Conclusions

This study examined the relationship between a novel firm-level measure of market competition (MCAC) and stock returns in the Indian stock market. The analysis yields a clear result: firms with lower MCAC (indicating higher cost efficiency and closer resemblance to a competitive ideal) are associated with higher future stock returns, whereas firms with higher MCAC (costs rising relative to history) tend to have lower subsequent returns. This finding is robust across portfolio-sorted returns and cross-sectional regressions. In essence, cost-efficient firms outperform cost-inefficient firms in terms of stock returns in our sample.

These results contribute to the broader debate on competition risk and asset pricing. In contrast to the classic view that competition risk should command a positive risk premium (higher competition → higher expected return), our evidence aligns more with a profitability/efficiency-based interpretation. It suggests that the stock market rewards companies that can operate efficiently under competitive pressure, rather than granting a blanket premium to all firms in competitive industries. Our findings align well with Taussig (2021), who also found a negative association between MCAC and returns in the U.S.. They also complement recent Indian evidence by Kaicker and Aggarwal (2023) at the industry level, and extend it by providing a firm-level perspective using a cost-based metric. On the other hand, our results differ from studies that emphasize a risk-premium view of competition (e.g. Hou and Robinson, 2006) because those studies used different proxies (industry concentration) and possibly captured a different facet of competition. We show that when looking within industries, it matters a great deal how a firm competes – efficient firms thrive and deliver returns, inefficient ones falter.

It is important to interpret these findings with some caution and acknowledge limitations. First, competition is a multifaceted construct – our focus on cost-based competition (MCAC) captures only one aspect (cost efficiency pressures). Competition also involves dimensions like innovation, quality, branding, and customer loyalty, which are not directly captured by MCAC. A firm could have a high MCAC (costs rising) because it is heavily investing in R&D or marketing – such investments might hurt short-run efficiency but build long-term competitive advantage. In such cases, the metric might paint a firm as inefficient when in reality it is strategically positioning for future gains (which might eventually yield returns beyond our sample horizon). Second, the absence of a straightforward "clean test" of competition means we rely on proxies that each have their imperfections. While MCAC is an innovative proxy, it could be influenced by factors unrelated to competition (e.g. input cost shocks, accounting changes). We mitigated this by controlling for other factors and showing consistent patterns, but unobserved variables could still confound the results. Third, our study is observational, so while we document correlations consistent with competition-based explanations, we cannot conclusively prove causality that competition risk *causes* the return differences. It is possible that an underlying third factor (say, management quality) leads to both low costs and high returns.

Notwithstanding these caveats, our findings have clear implications. For investors, the cost structure of firms appears to be an important indicator when selecting stocks, particularly in emerging markets like India. Monitoring a firm's MCAC or similar efficiency metrics could provide insights into its competitive health and future stock performance. For policymakers and regulators, the results suggest that promoting competitive markets does not harm investors; in fact, it fosters an environment where efficient firms can shine. Over the long run, this could lead to a more vibrant and innovative economy, as capital flows to the firms that use resources most effectively.

Future research could extend this work in several ways. One avenue is to explore other emerging markets with the MCAC measure or similar firm-level competition proxies to see if the efficiency premium is a general phenomenon outside the U.S. Additionally, researchers could delve into the interaction between competition and other factors – for example, does the value or momentum effect depend on the level of competition in an industry? Is the success of certain strategies (like quality investing) partly driven by competition dynamics? Another fruitful area is examining dynamic competition – using panel methods to see if changes in competition (e.g. a new competitor entering an industry) lead to predictable changes in incumbents' stock returns. Such analyses could better pin down the causal impact of competition. Finally, as data availability improves, combining traditional measures (like HHI) with firm-level ones (like MCAC, or text-based measures) in a unified asset pricing test could provide a more holistic understanding of how *both* industry-wide forces and firm-specific competitive positioning jointly influence expected returns.

In conclusion, our study underscores that competition matters for stock returns in India, but perhaps not in the simplistic way of "more competition = more risk = higher return." Instead, the story is richer: competition creates both risks and opportunities, punishing the weak and rewarding the strong. The stock market recognizes this by favoring firms that turn competition into an opportunity (through efficiency and innovation) and penalizing those for whom competition becomes a crippling risk. These insights add an emerging market perspective to the ongoing conversation in finance about how product market dynamics integrate into asset pricing. Further studies may explore the non-linearity of the relation between MCAC and stock returns and the role of firm-level measures in measing the competition.

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