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DETERMINANTS OF INVESTMENT RISK IN THE INDIAN CONSUMER GOODS SECTOR: THE DYNAMIC PANEL REGRESSION APPROACH

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The objective of the current paper is to study the relationship between company financial factors, macroeconomic factors and the market measures of risk of the Consumer Goods Sector of the Indian economy. Systematic, unsystematic and total risks are the measures of the risk used. Dynamic panel data regression techniques have been applied to the data of the companies comprising the S&P BSE FMCG index of the Bombay Stock Exchange (BSE) of India. The time frame established for the study is the period from 2011 to 2020. The results show that on average 89.6 percent of total risk is attributable to the unsystematic portion, whereas the rest is attributable to the systematic portion. Furthermore, both the financial variables and macroeconomic variables can be used to gauge the risk related to investments. Moreover, marketing personnel may justify their expenditure that builds their brand value as these efforts will reduce the risk for investors and increase their wealth. The results of this study are especially useful for business managers, as well as investors, helping them to understand risk and the factors contributing to it, which may provide useful insights regarding cost-of-capital and value-of-firm calculations.

Keywords: systematic risk, Indian fast moving consumer goods, unsystematic risk, idiosyncratic risk, dynamic panel data analysis

JEL Classification: G12, G32

INTRODUCTION

Every investor, stock trader and finance academic always seek how 'to exploit risk to earn greater returns' (Malkiel, 2011). For corporations, risk management helps increase their value. In fact, they should optimize their risk exposure so as to gain the maximum advantage (Cupic, 2015). From investors' point of view, there are multiple theories and viewpoints explaining financial markets and risk and return relationships. There are those who opine

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that nobody can beat the market, as markets move in a random fashion. So, nobody can predict market movements and make money. They are called random walk theorists (Malkiel, 2011). Yet, there are many stories of people making unfathomable amounts of money through stock markets, which has led to the development of many other theories suggesting the ways to beat the market. The common ground of the largest number of theories implies that, in order for a man to be able to make money on stock markets, they have to make predictions about the future movements of prices. For this purpose, investors have to consider various pieces of information in order to make their estimations. Generally, long-term investors study companies' fundamentals as opposed to the day traders who are focused on stock price movements (technical information). Furthermore, Indian stock markets have mostly been shown to be of a weak form of efficiency (Mishra, 2009; Gupta & Sankalp, 2017). This also reveals the fact that fundamental financial information can be used to make decisions on Indian stock markets.

Many theories have evolved over the years to help investors make predictions and stock market valuations. The most famous and the most followed theory of stock markets is 'Modern Portfolio Theory', according to which diversifying through creating a portfolio may enable an investor to reduce risk, simultaneously maintaining the same level of return (Malkiel, 2011). Not all risk, however, can be eliminated by simply increasing the number of investments. William Sharpe, John Lintner and Fisher Black analyzed the portion of risk that can be eliminated and the portion of risk that cannot. These analyses led to the creation of the Capital Asset Pricing Model (CAPM). The designated two types of risk are systematic risk (non-diversifiable), which is caused by the factors that affect all the firms on the market making stocks move in tandem with each other, on the one hand, and unsystematic (diversifiable) risk, which is caused by the factors peculiar to every company, such as the discovery of a new product or a workers' strike, on the other. CAPM suggested that investors should only focus on systematic risk and that they could increase their returns by undertaking more systematic risk (Bodie, Kane, Marcus & Mohanty, 2014). In the real world, however, decisions are not so made simply by being based on a single theory only. For example, the risk of bankruptcy might not be evident with just systematic risk, but the total risk must also be considered. Furthermore, there are studies (Gu & Kim, 2003; Kim, Kim & Gu, 2012) that showed that more than 85 percent of total risk was unsystematic and that it was illogical to ignore this portion. Also, empirical researchers have shown that markets are not as perfect and that investors' portfolios are not as diversified, either, as is assumed by CAPM (Levy, 1978; Merton, 1987). With this background in mind, the classification and measurement of risk provided by CAPM is used in the present study. Investors study the financial information of companies so as to gauge the expected performance of a particular company in the future in terms of the expected returns and risks. The focus of the present study is on the analysis of the relationship between companies' financial information and the risk measures provided by CAPM and used by statisticians.

An interesting aspect of the present study reflects in the fact that it is solely based on the companies belonging to the Indian Fast Moving Consumer Goods (FMCG) Sector. Hence the peculiar characteristics of this sector are also included, which makes the study more comprehensive. The products made by the FMCG companies are mostly consumer necessities. To ensure success, it becomes imperative for these companies to build their brand image on the market, which may increase their market share. Advertising plays a very important role in the FMCG Sector in that it improves the image of products and also builds the brand value. Branding and advertising are the business which each company's marketing department are in charge of. The marketing and finance functions are often at a crossroads, given the fact that advertising includes cash outflows without tangible returns, whereas the finance function is focused on companies' shareholders' wealth maximization, which may only happen if derived benefits are greater than the incurred costs. The present study seeks to align the objectives of the two departments by including the variables catering

to their respective objectives. The primary research questions for the study can be listed as follows:

RQ1: Is the fundamental company-specific information relevant for investors in the Indian FMCG Sector?

RQ2: Can accounting and macroeconomic information be used to gauge the risk related to the companies of the FMCG Sector?

RQ3: Can the expenditures incurred by the marketing department be justified with respect to the company's shareholders' wealth maximization principle?

These questions are answered in the present study by finding the relationship between the company-specific variables, the macroeconomic variables and the market-based measures of risk. This is done by using panel data regression. The paper is organized into the seven sections: Section 1 introduces the paper, Section 2 provides a review of the related literature, Section 3 briefs the research methodology used in the paper, Section 4 discusses the findings of the study, Section 5 presents the conclusions of the paper, Section 6 details the implications, and the last, Section 7, apprises of the limitations and the future scope of research.

LITERATURE REVIEW

As discussed, the Capital Asset Pricing Model segregates total risk into systematic and unsystematic risks. CAPM suggests investors should only focus on the systematic portion as the unsystematic portion can be diversified. Hence, most prior studies have only been conducted with respect to systematic risk, whereas a very few of them have considered unsystematic or total risk. Based on CAPM, the literature review in the field of risk determinants was done and the same is presented as per the type of the risk studied.

Systematic risk

Over the years, research in the area of systematic risk has taken multiple financial variables into account so as to explain changes in systematic risk. Numerous studies have been conducted, taking firms' profitability, liquidity, leverage, size and growth variables. Different studies have used different measures of profitability, such as return on shareholders' funds, return on assets, the net profit margin and profit before tax. No unanimous conclusion, however, has been drawn regarding the relationship between profitability and systematic risk. While some studies, like A. D. Castagna and Z. P. Matolcsy (1978) and C. Mar-Molinero, C. Menéndez-Plans and N. Orgaz-Guerrero (2017), have shown a positive relationship between these variables, there are studies, like D. E. Logue and L. J. Merville (1972), and J. H. Hung and Y. C. Liu (2005) having shown the presence of a negative relationship. There is a similar case when speaking of liquidity; namely S. F. Borde (1998) conducted a study on 52 restaurant companies traded on American stock exchanges for the period from 1992 to 1995. The author depicted a positive relationship between systematic risk and liquidity. J. S. Lee and S. S. Jang (2007) conducted a study on 16 airline companies from 1997 to 2002 and depicted a negative relationship of systematic risk with liquidity. They also showed a positive relation between systematic risk and leverage. On the contrary, the use of a higher debt sometimes also proved to be beneficial for companies due to a reduction in their risk as debt providers keep a check on the actions carried out by management (Chun & Ramasamy, 1989; Iqbal & Shah, 2012). M. J. Iqbal and S. Z. A. Shah (2012) conducted a study on 93 firms listed on Karachi Stock Exchange for the period from 2005 to 2009, having evidenced the presence of a negative relationship with leverage, the market value of equity, liquidity, operating efficiency and dividend payout, on the one hand, and the presence of a positive relationship with profitability, growth and the firm size, on the other. Studies like M. Mardini (2013) and D. Y. Liu and C. H. Lin (2015) also corroborated a positive relationship between the size and systematic risk. However, W. J. Breen and E. M. Lerner (1973) and W. S. Lee, J. Moon, S. Lee and

D. Kerstetter (2015) showed a negative relationship, while D. C. Aruna and A. Warokka (2013) showed no statistically significant relationship at all. Beside these commonly used variables, there are studies that have considered sector-specific variables as well. V. Kumar, A. R. Aleemi and A. Ali (2015) studied the relationship between systematic risk in Pakistan's banking sector with the loan portfolio quality. J. S. Lee and S. S. Jang (2007) included a safety measure in their study on the US airline industry. S. N. Tripathi, D. Misra and M. Siddiqui (2020) assessed the impact of advertising intensity on the market risk of the firms in the consumer goods sector of the Indian economy, having shown that an increased advertising expenditure reduced market risk. Some studies have analyzed the relationship between systematic risk and macroeconomic factors, too. H. N. G. Cheema (2016) conducted a study on Pakistan, India and China wishing to identify the factors that affected systematic risk in these countries, considering both financial and macroeconomic factors. In fact, the study concluded that macroeconomic factors exerted a bigger impact on systematic risk in comparison with financial factors. Even the study by G. Boz, C. Menéndez-Plans and N. Orgaz-Guerrero (2015) also corroborated the same results when they found the beta relationship with seven macroeconomic and seven financial variables. A. A. Robichek and R. A. Cohn (1974) and R. Karakus (2017) both showed the presence of a significant relationship between inflation and economic growth and systematic risk, even though both had been conducted on broadly dispersed geographies and time periods. D. K. Patro, J. K. Wald and Y. Wu (2002) used the dynamic panel data model to study the systematic risk of the 16 OECD countries. Inflation and exports showed a positive association with the world beta, whereas imports and government surplus to the GDP showed the presence of a negative association with the world beta.

Unsystematic risk

Relatively few studies have solely focused on unsystematic risk. While CAPM reiterates the fact that systematic risk can be diversified by portfolio creation. Hence, it is not important for investment decisions, but empirical studies have shown a very high percentage of total risk to be unsystematic risk, which is impractical to ignore (Van Horne, 1998; Kim, Gu & Mattila, 2002). Further market imperfections and investors' inability to diversify make unsystematic risk important for stock valuation (Chaterjee, Lubatkin & Schulze, 1999; Gu & Kim, 2003). With this background in mind, some research studies have been conducted in order to discover the relationship between financial variables and unsystematic risk, so that the management of firms can understand investors' expectations and incorporate them in their decisions. Z. Gu and H. Kim (2003) conducted a study on the US hotel REIT firms, demonstrating that the dividend payout and debt ratio positively related with unsystematic risk, while capitalization negatively related with it. L. T. Hsu and S. Jang (2008) also based their study on the hospitality industry. They showed that the firms with higher profits and a bigger size, lower operating costs and a lower debt exhibit lesser volatility in the event of the firm's level changed. M. Dalbor, N. Hua and W. Andrew (2014) explored the impact of management efficiency, including operations management, the size of the firm and financial management on unsystematic risk. Pooled regression revealed the fact that the firms of a smaller size, higher operating expenses, a higher cost of goods sold, higher financial leverage and lower working capital had higher unsystematic risk. They showed that management efficiency was especially critical for restaurant firms in that highly competitive sector. Studies of the variables used in the present study are listed in Table 1.

Total risk

J. Ang, P. Peterson and D. Peterson (1985) examined the total risk determinants for approximately 350 US firms. Their yearly analyses revealed the fact that the size and dividends were negatively related to total risk, financial leverage was positively related, and operating risk and contra-liquidity showed mixed results. The increased size and dividend payout were considered to be a positive signal by investors leading to lower risk. M. H. Chen (2013) also supported this result pertaining to the size when an analysis was

Table 1 The summary of the previous studies

Independent variable	Studies	Result
	Systematic risk	
Size	D. Castagna and Z. P. Matolcsy (1978); M. Brimble and A. Hodgson (2007); K. Angel, C. Menéndez-Plans and N. Orgaz-Guerrero (2018)	Positive
	D. E. Logue and L. J. Merville (1972); M. J. Iqbal and S. Z. A. Shah (2012); W. S. Lee *et al* (2015)	Negative
	V. Kumar, A. R. Aleemi and A. Ali (2015); J. H. Hung and Y. C. Liu (2005); R. C. Moyer and R. Chatfield (1983)	No significant
Liquidity	A. D. Castagna and Z. P. Matolcsy (1978); J. S. Lee and S. S. Jang (2007); W. S. Lee *et al* (2015)	Negative
	S. F. Borde (1998); J. H. Hung and Y. C. Liu, (2005); C. Mar-Molinero *et al* (2017)	Positive
	R. C. Moyer and R. Chatfield (1983); Z. Gu and H. Kim (1998); D. C. Aruna and A. Warokka (2013)	No significant
Profitability	Castagna and Matolcsy (1978); M. J. Iqbal and S. Z. A. Shah (2012); C. Mar-Molinero *et al* (2017)	Positive
	D. E. Logue and L. J. Merville (1972); S. F. Borde (1998); P. D. Biase and E. D'Apolito (2012)	Negative
	S. F. Borde, K. Chambliss and J. Madura (1994); W. S. Lee *et al* (2015); Y. H. Shin, M. Hancer, J. Leong and R. Palakurthi (2010)	No significant
Price to Book	H. N. G. Cheema (2016)	Different in different models
Dividend	Castagna and Matolcsy (1978); D. E. Logue and L. J. Merville (1972); R. Karakus (2017)	Negative
	H. Kim *et al* (2012); M. Brimble and A. Hodgson (2007)	No significant
Advertising	S. N. Tripathi *et al* (2019); W. S. Lee *et al* (2015); K. McAlister, R. Srinivasan and M. Kim (2007)	Negative
	Y. Kim, M. Kim and J. O'Neill (2013)	No significant
Brand value	J. Dahlgren and H. Lindvall (2010)	Negative
	R. C. Moyer and R. Chatfield (1983)	No significant
Economic growth	G. Boz *et al* (2015)	Negative
	C. Mar-Molinero *et al* (2017)	No significant
Inflation	K. M. Al-Qaisi (2011)	Positive
	M. Arfaoui and E. Abaoub (2010)	No significant
US/world stock market	G. Boz *et al* (2015)	Negative
	C. Mar-Molinero *et al* (2017)	No significant
Interest rate	M. Arfaoui and E. Abaoub (2010)	Negative
	Unsystematic risk	
Size	Z. Gu and H. Kim (2003); L. T. Hsu and S. Jang (2008); M. Dalbor *et al* (2014)	Negative
	M. H. Chen (2013)	No significant
Liquidity	Z. Gu and H. Kim (2003)	No significant
Profitability	L. T. Hsu and S. Jang (2008)	Negative
	M. H. Chen (2013)	No significant

Dividend	Z. Gu and H. Kim (2003)	Positive
	L. T. Hsu and S. Jang (2008)	No significant
Advertising	Y. Kim, M. Kim and J. O'Neill (2013)	Positive
Inflation	M. Arfaoui and E. Abaoub (2010)	Negative
Trade openness	M. Arfaoui and E. Abaoub (2010)	Positive
Interest rate	M. Arfaoui and E. Abaoub (2010)	No significant
	Total Risk	
Size	J. Ang, P. Peterson and D. Peterson (1985); M. Arfaoui and E. Abaoub (2010)	Negative
	J. S. Lee and S. S. Jang (2007)	No significant
Liquidity	J. Ang *et al* (1985); S. F. Borde *et al* (1994); S. F. Borde (1998)	Positive
	A. Jahankhani and M. J. Lynge (1979)	Negative
	J. S. Lee and S. S. Jang (2007); Chen (2013)	No significant
Profitability	J. S. Lee and S. S. Jang (2007)	Negative
	M. H. Chen (2013)	No significant
Dividend	J. Ang *et al*. (1985); A. Jahankhani and M. J. Lynge (1979); S. F. Borde (1998)	Negative

Source: Authors

carried out of China's hotel industry. However, when J. S. Lee and S. S. Jang (2007) conducted an empirical study on the US airline industry, they failed to find any significant relationship between risk and the size of the firms. The result pertaining to dividend payout was supported by A. Jahankhani and M. J. Lynge (1979) and S. F. Borde (1998) as well. Liquidity is another important variable considered by the largest number of the studies of risk. J. Ang *et al* (1985), S. F. Borde, K. Chambliss and J. Madura (1994) and S. F. Borde (1998) showed that higher liquidity was the cause of concern for investors as it meant that the companies were not using their cash efficiently and were investing in more short-term investments. On the other hand, A. Jahankhani and M. J. Lynge (1979) showed the presence of a negative relationship between the two, and J. S. Lee and S. S. Jang (2007) and M. H. Chen (2013) were unable to find any significant relationship at all. M. H. Chen (2013) was unable to find any significant relationship between total risk and profitability, either. However, J. S. Lee and S. S. Jang (2007) found a negative relationship as higher profitability reduces investors' risk.

Research Gap

While there have been quite a few studies on the factors that affect systematic risk on international markets, on the one hand, their results have been very inconsistent, on the other. There are but few studies on Indian markets. For unsystematic risk and total risk, there is quite a limited number of the studies on international markets, as well as those conducted on Indian markets. The present study includes all the three measures of risk to make the study comprehensive. Furthermore, it has been shown that the analysis made on a single industry has better explanatory power than that conducted on firms from across industries (Patel & Olsen, 1984). Thus, the present study is restricted to only one single sector of the Indian economy, namely the FMCG Sector. Beside the usual company factors considered by the largest number of previous researchers (i.e. profitability, liquidity, the size, the dividend) as the risk determinants, the present study takes into account two more factors specific to the FMCG Sector, viz. advertising intensity and the brand value measured by the market share of each company. Moreover, macroeconomic variables were also used in a very few studies. The present study includes the macroeconomic variables as the explanatory variables for all the risk measures. After an exhaustive literature review, the following hypotheses are set:

H1a,1b,1c: Profitability does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H2a,2b,2c: Liquidity does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H3a,3b,3c: The size does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H4a,4b,4c: The investors' perception does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H5a,5b,5c: Investors' expectations do not exert any significant impact on systematic risk, unsystematic risk and total risk.

H6a,6b,6c: Advertising Intensity does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H7a,7b,7c: The Dividend does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H8a,8b,8c: Brand value does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H9a,9b,9c: The World Stock Market does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H10a,10b,10c: Economic Growth does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H11a,11b,11c: Trade Openness does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H12a,12b,12c: Inflation does not exert any significant impact on systematic risk, unsystematic risk and total risk.

H13a,13b,13c: The Interest Rate does not exert any significant impact on systematic risk, unsystematic risk and total risk.

Where a stands for systematic risk, b stands for unsystematic risk, and c stands for total risk.

RESEARCH METHODOLOGY

The present section sets forth the variables, the empirical and conceptual models and the data source used for the purpose of the research study.

The description of the variables

The present research study used the two categories of variables, namely dependent and independent ones. The independent variables are further divided into the company-specific and macroeconomic variables. The description of each variable is discussed in detail in this section.

The dependent variables

In the present study, three dependent variables, i.e. the three measures of risk as per CAPM: Systematic Risk, Unsystematic Risk and Total Risk are used. Systematic risk is the risk to firms due to the external factors such as political risk, the fiscal policy, etc., which affect all the firms on the market. Unsystematic risk is a risk caused due to the firm-specific factors such as the financial position and managerial capabilities. Total risk arises due to a combination of all the factors. The calculation of each risk measure is now explained. W. F. Sharpe's (1963) single index model is used to calculate systematic risk. According to that model, the relationship between market return and security return can be estimated via a linear function reading as follows:

$$R_s=\alpha_s+\beta_s R_M+e_s \quad (1)$$

where, R_s is security return, β_s (beta) is the slope, R_M is return on the market portfolio, α_s is the intercept term, e_s is the error term.

H. Levy and M. Sarnat (1984) took the variance of the equation (1) to clearly segregate total risk into systematic and unsystematic:

$$\sigma_S^2=\beta_S^2\sigma_M^2+\sigma_e^2 \quad (2)$$

where, σ_S^2 is the variance of daily returns over the period of one year, σ_M^2 is the variance of daily market

returns over the period of one year, $\beta_S^2 \sigma_M^2$ is the security covariance with the market, i.e. systematic risk, σ_e^2 is the residual portion of total risk i.e., unsystematic risk.

Just like previous studies (Jahankhani & Lynge, 1979; Borde *et al*, 1994; Gu & Kim, 2003), the present study uses beta as the measure of systematic risk, the standard deviation as the measure of total risk, and the variance of the residual term as unsystematic risk. Beta (β_s), the measure of systematic risk, is calculated for each company for each year by regressing the company's daily returns over the market's daily returns (using the equation 1). To calculate security returns (R_s) for each company/security (s), the daily share prices (P) are used, as in the equation (3):

$$R_S = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (3)$$

where, P_t is the current day's price and P_{t-1} is the previous day's price.

The S&P BSE 500 index is used as a proxy for the market index, given the fact that it is the only index on the Bombay Stock Exchange (BSE) with such a large sample of 501 companies. This index represents about 95 percent of the market capitalization (free float) of all the stocks listed on the BSE. Market returns (RM) are calculated in the same manner as stock returns are, i.e. by calculating the percentage change in daily index values. Total risk is calculated for each company for each year by finding the standard deviation of daily returns. Unsystematic risk is calculated using the equation (2) in the following manner:

$$\sigma_e^2 = \sigma_S^2 - \beta_S^2 \sigma_M^2 \quad (4)$$

where, σ_S^2 is the variance of daily returns over the period of one year, σ_M^2 is the variance of daily market returns over the period of one year, $\beta_S^2 \sigma_M^2$ is the security covariance with the market, i.e. systematic risk, σ_e^2 is the residual portion of total risk, i.e. unsystematic risk.

The independent variables

To explain the market measures of risk, company-specific and macroeconomic variables are used in this research study. On the side of the company-specific variables, profitability, liquidity, the size and the dividend are the variables most commonly used in the previous studies. In the present study, return on total assets is used as a measure of profitability; the current and quick ratios are used to measure liquidity; the log of market capitalization is used to measure the size, and the dividend rate is used to account for dividend payments. Apart from these commonly used variables, the study also includes investors' expectations (measured by the Price-Earnings Ratio) and investors' perceptions (measured by the Price-to-Book ratio). Moreover, the two variables specific to the FMCG sector are also added, viz. the advertising intensity of the firms and their market share indicating their brand value. To see the impact of the macroeconomic variables on risk, five variables are considered, namely the MSCI All Country World Index (to capture the impact of the world stock markets on the Indian firms), Indian economic growth (measured by the Annual GDP growth rate), the Current Account Balance as a percentage of the GDP (in order to incorporate the impact of international trade), the domestic inflation rate (the CPI growth rate), and the domestic interest rate (the repo rate). The description and measurement of all the variables are tabulated in Table 2.

Empirical models

To examine the impact of the company-specific and macroeconomic variables on systematic risk, unsystematic risk and total risk, dynamic panel data regression was used in this research study. The conceptual model proposed for analyzing the impact of the company-specific and macroeconomic variables on systematic risk, unsystematic risk and total risk is shown in Figure 1.

The study incorporates the two-step System Generalized Method of Moments (SGMM) propounded by M. Arellano and O. Bover (1995)

Table 2 The list of the variables and their description

Predicted Variables	Measurement	Description
Systematic Risk (SysRisk)	Beta; calculated by regressing security returns on the market (the S&P BSE 500 index) returns.	Beta measures the sensitivity of stock returns to market returns.
Unsystematic Risk (UnsysRisk)	The difference between total and systematic risks.	This is the idiosyncratic risk caused by the factors specific to each single company.
Total Risk (TotalRisk)	The standard deviation of daily returns.	Variability in daily returns is taken as a measure of total risk.
Explanatory Variables	Measurement	Description
	Company-specific variables	
Current Ratio (CR)	Current assets/current liabilities	It measures the liquidity position.
Return on Total Assets (RoTA)	Net income/total assets	It measures the profitability of each company. Profitable companies are expected to be less risky.
Market Capitalization (MktCap)	A log of (the number of the shares outstanding on the last day of the year*the closing price on last day of the year).	This is a measure of the size of a firm.
Price Earnings Ratio (PE)	Market price per share/earnings per share	Investors' expectations about earnings can be gauged from this ratio.
Price to Book Ratio (PB)	Market price per share/book value per share	Investors' perception about the real worth of the business can be gauged from this ratio.
Advertising Intensity (AdvInt)	Advertising expenditure/sales	Advertising is important for consumer goods, which involves huge outlays.
Dividend Rate (Div)	Dividend per share/face value per share	Dividend payment signals the position of a company to its investors and hence may affect risk.
Quick Ratio (QR)	(Current assets-inventories-prepaid expenses)/current liabilities	It measures the liquidity position with respect to quick assets.
Market share (MktShare)	Sales of a company/total sales of all the companies of that industry	It measures the value of a brand on the market.
	Macroeconomic Variables	
Annual returns of MSCI ACWI (ACWI)	The MSCI ACWI index (All Country World Index) is a stock price index representing the whole world's capital markets.	
Annual GDP growth rate (GDP)	It shows the economic growth of a country.	
Current Account balance as percentage of GDP (CAB)	It shows the trade openness of a country. This measure is included in order to see the effects of globalization on Indian stock markets.	
Growth rate of consumer price index (CPI)	This measure is included in order to see the impact of the inflation level of the economy on the risk measures.	
Interest rate (IntRate)	The repo rate given by the Reserve Bank of India (RBI)	

Source: Authors

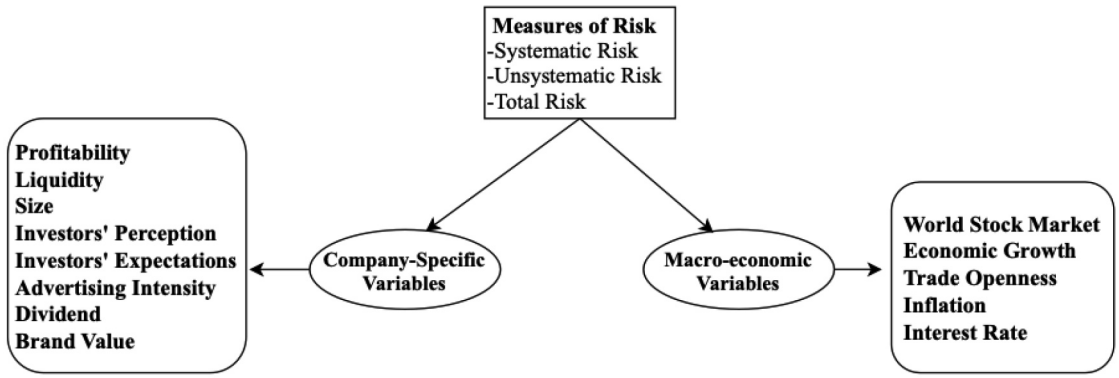

Figure 1 The research model

Source: Authors

and R. Blundell and S. Bond (1998). Because of the likelihood of heteroskedasticity, serial correlation, and endogeneity in the data, the SGMM is regarded as the most appropriate method when compared to the static panel method or any other dynamic panel data methods. The study proposes three regression models. Model 1, Model 2 and Model 3 examine the impact of the company-specific and macroeconomic variables on systematic, unsystematic and total risk, respectively. The regression equation of each model reads as follows:

Model 1

$$SysRisk = \alpha + \beta_1 CR_{it} + \beta_2 RoTA_{it} + \beta_3 MktCap_{it} + \beta_4 PE_{it} + \beta_5 PB_{it} + \beta_6 AdvInt_{it} + \beta_7 QR_{it} + \beta_8 MktShare_{it} + \beta_9 ACWI_{it} + \beta_{10} GDP_{it} + \beta_{11} CAB_{it} + \beta_{12} CPI_{it} + \beta_{13} IntRate_{it} \varepsilon_{it} \quad (5)$$

Model 2

$$UnsysRisk = \alpha + \beta_1 CR_{it} + \beta_2 RoTA_{it} + \beta_3 MktCap_{it} + \beta_4 PE_{it} + \beta_5 PB_{it} + \beta_6 AdvInt_{it} + \beta_7 QR_{it} + \beta_8 MktShare_{it} + \beta 9 ACWIit + \beta_{10} GDP_{it} + \beta_{11} CAB_{it} + \beta_{12} CPI_{it} + \beta_{13} IntRate_{it} \varepsilon_{it} \quad (6)$$

Model 3

$$TotalRisk = \alpha + \beta_1 CR_{it} + \beta_2 RoTA_{it} + \beta_3 MktCap_{it} + \beta_4 PE_{it} + \beta_5 PB_{it} + \beta_6 AdvInt_{it} + \beta_7 QR_{it} + \beta_8 MktShare_{it} + \beta_9 ACWI_{it} + \beta_{10} GDP_{it} + \beta_{11} CAB_{it} + \beta_{12} CPI_{it} + \beta_{13} IntRate_{it} \varepsilon_{it} \quad (7)$$

where, α is the constant, β_1…… β_{13} are the coefficients calculated for the firm i (1, 2, ..43) for the time period t (2011, 2012,…2020), ε is the error term and the other variables are discussed above.

The data and sample selection

The constituent companies of the S&P BSE Fast Moving Consumer Goods Index of the BSE, an Indian stock exchange, which is also Asia's first stock market, are the sample for the current study. The S&P BSE FMCG index has 63 constituents, whose data were collected and analyzed for the period of 10 years from 2011 to 2020. Out of the 63 companies, 20 had to be excluded for the reason of a lack of data for all the years mentioned above. For the remaining 43 companies, the stock price data were retrieved from the BSE website and the same were adjusted for the bonus issues and the stock splits. The financial information of all the companies were retrieved from the CMIE Prowess IQ database and the macroeconomic statistics were retrieved from the Reserve Bank of India, the IMF (the International Monetary Fund), UNCTAD (The United Nations Conference on Trade and Development), and the MSCI (Morgan Stanley Capital International) websites.

RESULTS AND DISCUSSION

The descriptive statistics

All the variables used in the study are summarized in Table 3, where the number of the observations, the mean values, the standard deviations, the minimum values and the maximum values are listed for each variable. There are 43 companies and a period of 10 years, so there are a total of 430 observations for each variable. The mean value of beta is 0.883, while the market beta is 1. Therefore, the FMCG industry can be said to be less volatile than the overall market.

Table 3 The descriptive statistics of all the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
SysRisk	430	0.883	0.428	-0.256	2.287
UnsysRisk	430	0.001	0	0	0.003
TotalRisk	430	0.026	0.009	0.007	0.055
Diversifiability (unsystematic/total risk) = 0.896					
CR	430	1.505	0.825	0.34	5.92
RoTA	430	10.444	8.457	-13.59	38.67
MktCap	430	9.952	2.145	4.161	15.42
PE	430	25.559	156.23	-1750	1924.9
PB	430	6.703	7.96	-2.131	61.95
AdvInt	420	0.056	0.052	0	0.203
Div	430	286.184	530.352	0	3980
QR	430	0.772	0.688	0.05	5.33
MktShare	430	0.104	0.165	0	0.822
ACWI	430	0.101	0.125	-0.089	0.273
GDP	430	6.665	1.35	4.23	8.5
CAB	430	-2.187	1.301	-4.915	-0.536
CPI	430	7.325	2.817	2.491	11.989
IntRate	430	0.068	0.011	0.044	0.085

Source: Authors

Total risk varies from 0.7% to 5.5%, with a mean of 2.6% and a standard deviation of 0.9%. The diversifiability ratio is also calculated, which is the ratio of unsystematic risk to total risk (Chen, 2013). The average diversifiability ratio for the sample firms is 0.896, which shows that on average 89.6 percent of total risk is attributable to the unsystematic portion and rest is attributable to the systematic portion. The average returns on total assets in the FMCG sector over the 10-year period are 10.44 percent, with a very high standard deviation of 8.46 percent. The minimum RoTA being -13.59 percent and the maximum exceeding 38 percent. Similarly, with the help of the summary statistics, the distribution of all the variables can be understood.

Correlation analysis

A correlation matrix was made so as to see the association between all the variables (reference is made to Table 4).

Mostly all the independent variables showed significant correlation with the dependent variables. All the variables, except for the current ratio and the market share, significantly correlated with systematic risk. Interestingly, none of the macroeconomic variables showed any significant association with unsystematic risk or with total risk. Also, a high degree of correlation between the independent variables leads to the problem of multicollinearity. D. N. Gujarati and D. Porter (2009) suggested that the data had a problem of multicollinearity when the degree of correlation was greater than 0.8. In the present study, no independent variable showed a value greater than 0.8. Another thumb rule for multicollinearity is that a Variance Inflation Factor (VIF) of 10 or above implies the presence of multicollinearity (O'brien, 2007). The VIF scores were calculated, the results of which are accounted for in Table 5. The outcomes of the mean VIF scores depict that the scores for each model are 2.57, which is less than the threshold limit. Hence, it can be concluded that there is no multicollinearity.

The diagnostic tests

Before running panel data regression, it is vital that a few diagnostic tests (Table 5) were performed so as to apply an appropriate regression technique. First,

Table 4 The correlation matrix

Variables	SysRisk	UnsysRisk	TotalRisk	CR	RoTA	MktCap	PE	PB	AdvInt	Div	QR	MktShare	ACWI	GDP	CAB	CPI	IntRate
SysRisk	1.000																
UnsysRisk	0.4906*	1.000															
TotalRisk	0.5729*	0.9852*	1.000														
CR	0.019	-0.1568*	-0.1381*	1.000													
RoTA	-0.2826*	-0.4342*	-0.4353*	0.3838*	1.000												
MktCap	-0.2770*	-0.7407*	-0.7197*	0.2023*	0.5847*	1.000											
PE	-0.2042*	-0.4885*	-0.4932*	0.047	0.2418*	0.6018*	1.000										
PB	-0.3289*	-0.5836*	-0.5876*	0.078	0.6752*	0.7926*	0.6616*	1.000									
AdvInt	-0.3689*	-0.4739*	-0.4781*	-0.021	0.2340*	0.4985*	0.5508*	0.5765*	1.000								
Div	-0.3605*	-0.6588*	-0.6496*	0.2335*	0.6703*	0.8244*	0.4083*	0.6439*	0.3991*	1.000							
QR	-0.1415*	-0.3363*	-0.3203*	0.7424*	0.5048*	0.3795*	0.2810*	0.3770*	0.2601*	0.3820*	1.000						
MktShare	0.072	-0.3373*	-0.2932*	0.1047*	-0.011	0.3989*	0.1379*	0.1000*	0.1003*	0.3143*	0.011	1.000					
ACWI	-0.0999*	-0.031	-0.009	0.021	0.009	0.007	-0.076	-0.038	-0.004	0.015	0.015	0.013	1.000				
GDP	0.1428*	0.028	-0.006	-0.029	0.017	0.026	0.1456*	0.1199*	0.025	-0.027	-0.031	-0.011	-0.1515*	1.000			
CAB	0.2751*	-0.014	0.047	0.1386*	0.1469*	0.2185*	0.1253*	0.1605*	-0.095	0.088	0.1063*	0.046	0.1152*	0.2727*	1.000		
CPI	-0.3541*	0.091	0.072	-0.1379*	-0.1567*	-0.2744*	-0.2068*	-0.2253*	0.1080*	-0.1042*	-0.1307*	-0.046	0.2121*	-0.067	-0.5758*	1.000	
IntRate	-0.3409*	0.051	-0.015	-0.1632*	-0.1498*	-0.2342*	-0.0977*	-0.1325*	0.1256*	-0.0987*	-0.1489*	-0.055	-0.3609*	-0.061	-0.6422*	0.5933*	1.000

Note: *shows significance at the 0.05 level

Source: Authors

Table 5 The results of the diagnostic tests

Tests	Model 1: SysRisk		Model 2: UnsysRisk		Model 3: TotalRisk	
	Findings	Interpretation	Findings	Interpretation	Findings	Interpretation
Levin-Lin-Chu Test (Stationarity)	All variables were stationary at level					
Breusch-Pagan Test (Heteroskedasticity)	Chi^2 = 24.43; Prob > chi^2 = 0.0000	The presence of hetero-skedasticity	Chi^2 = 62.23; Prob > chi^2 = 0.0000	The presence of hetero-skedasticity	Chi2 = 46.20; Prob > chi^2 = 0.0000	The presence of hetero-skedasticity
Wooldridge Test (Autocorrelation)	F(1, 41) = 7.653; Prob > F = 0.0005	The presence of the first-order auto-correlation	F(1, 41) = 10.250; Prob > F = 0.0006	The presence of the first-order auto-correlation	F(1, 41) = 24.109; Prob > F = 0.0000	The presence of the first-order auto-correlation
Ramsey RESET Test (Omitted Variables)	F(3, 402) = 9.04; Prob > F = 0.0000	The model omitted the variables	F(3, 402) = 25.52; Prob > F= 0.0000	The model omitted the variables	F(3, 402) = 11.02; Prob > F= 0.0000	The model omitted the variables
Wu-Hausman Test (Endogeneity)	F(1,363) = 8.545; Prob > F = 0.0037	The variables are endogenous	F(1,363) = 6.505; Prob > F = 0.0012	The variables are endogenous	F(1,363) = 6.714; Prob > F = 0.0000	The variables are endogenous
Mean Variance Inflation Factors (Multicollinearity)	2.57	No multi-collinearity	2.57	No multi-collinearity	2.57	No multi-collinearity

Source: Authors

the Levin-Lin-Chu unit root test was performed to check for the stationarity of all the variables (Levin, Lin & Chu, 2002). This test is considered to be the most suitable test in the case of balanced panel data. The results of the test rejected the null hypothesis for all the variables at a 5-percent significance level, indicating the fact that the variables were stationary and there was no unit root. Second, one of the most important assumptions of regression is homoskedasticity, which indicates the fact that the error term has a constant variance. Heteroskedasticity is the violation of this assumption. The Breusch-Pagan test was done to test heteroskedasticity. The findings obtained by doing the test for all the three models confirmed the presence of heteroskedasticity as the null hypothesis was rejected.

Additionally, the Wooldridge test for serial correlation was used to test autocorrelation (Wooldridge, 2007). The result depicts that the null hypothesis is rejected, and it is possible to draw conclusions related to the presence of the first-order autocorrelation, which means that the error terms follow the pattern rather than being independent of each other. Another diagnostic test implies checking if any important independent variable is omitted from the model, and the problem of underspecifying or misspecifying variables in the model arises. The omitted variables lead to the violation of the exogeneity assumption. In order to check if the model has (or has not) omitted the variables, the Ramsey Regression Equation Specification Error Test (RESET) was applied (Ramsey, 1969). The findings of the test demonstrate the rejection of the null hypothesis and inferences as to the presence of the important, however omitted variables can be drawn. Lastly, the Wu-Hausman test was performed so as to check for endogeneity. The null hypothesis asserts that the OLS estimator is consistent and that the considered variable can be deemed to be exogenous. The outcome indicates the fact that the null hypothesis is rejected, as the F-statistics are significant at a 5-percent significance level and the interpretation of the endogenous variables can be concluded as such (Wu, 1973; Hausman, 1978).

Regression analysis

With respect to solving the heteroskedasticity problem, autocorrelation, the omitted variables and endogeneity, the dynamic panel data regression technique was applied in the study. To investigate the impact of the company-specific and macroeconomic variables on the risk measures, SGMM regression was performed. As discussed earlier, the present paper refers to the nine company-specific variables, namely CR, RoTA, MktCap, PE, PB, AdvInt, Div, QR, and MktShare. Also, each model includes the five macroeconomic variables, namely ACWI, GDP, CAB, CPI and IntRate. Regarding the assessment of the impact of these variables, three regression models were developed. The findings of the models 1, 2 and 3 are tabulated in Table 6. Firstly, the results of the present study are coherent with the theory. The number of the macroeconomic variables that affect systematic risk is greater as compared to the number of the macroeconomic factors affecting unsystematic risk. Also, the number of the company-specific variables that significantly affect unsystematic risk is greater as compared to those that affect systematic risk. Furthermore, there are certain factors that affect systematic, unsystematic and total risk, too, in a similar manner. Profitability (measured by return on total assets) showed a positive association with all the three measures of risk. So, the hypotheses H1a, H1b and H1c remain rejected. This result is contradictory to the underlying theory stipulating that highly profitable firms should pose lower risk for investors. However, the previous studies such as C. Mar-Molinero *et al* (2017), M. J. Iqbal and S. Z. A. Shah (2012) and A. D. Castagna and Z. P. Matolcsy (1978) also showed the presence of a positive association between profitability and systematic risk. Confirming the results of the previous studies (Logue & Merville, 1972; Patro *et al*, 2002; Karakus, 2017), the dividend showed a negative association with not only systematic risk, but unsystematic and total risk as well, which means that the hypotheses H7a, H7b and H7c are rejected. The firms paying higher dividends are perceived to be performing well; hence investors perceive them to be characterized by a smaller risk. The price-to-book ratio showed the presence of a positive association with unsystematic risk and total risk. So, the hypotheses H4b and H4c are rejected, whereas the hypothesis H4a is not rejected. When the market value of shares is higher as compared to their book value, such a situation may be risky since stocks are overvalued on the market and might fall back to their book-value level. However, this concern does not affect the magnitude with which a firm is affected by economic changes, i.e. the PB ratio does not significantly affect systematic risk. Systematic risk is also affected by its lag value, on the one hand, whereas, on the other, unsystematic and total risks are not affected by their respective lag values, which means that the systematic risk of one year has a role in the next year's value as well.

Two measures specific to the FMCG sector are used in the present study. Both advertising intensity and the market share are significant in explaining risk. The hypotheses H6a, H6c, H8b and H8c are rejected, whereas the hypotheses H6b and H8a are not. While the higher advertisement expenses reduced systematic and total risks, the higher market share reduced unsystematic and total risks. Both advertisements and the higher market share create a positive brand image leading to investors' lower risk perceptions. Measured by the current ratio and the quick ratio, the size of the firm and the PE ratio, liquidity showed a significant positive relationship with only unsystematic risk. Out of the 2nd, 3rd and 5th hypotheses, the hypotheses H2b, H3b and H5b are rejected, whereas the others are not, which means that investors find higher liquidity to be a sign of the inefficient utilization of cash, hence a risky position for business. They also believe a big size to be detrimental to the organization because of the inefficiencies that might creep in or because firms might opt for riskier investments. Smaller firms have more flexibility in running their operations (Lee & Jang, 2007). Investors' positive expectations about the company, as reflected in high PE ratios, also imply a risky situation, given the fact that the company is put a lot of pressure on in order for it to perform according to such expectations.

The GDP showed a positive association with all the three risk measures. The hypotheses H10a, H10b and H10c are rejected. G. Boz *et al* (2015) showed that when

Table 6 The dynamic panel data regression results

Independent Variables	Model 1: SysRisk		Model 2: UnsysRisk		Model 3: TotalRisk	
	Coefficient (t-value)	Standard Error	Coefficient (t-value)	Standard Error	Coefficient (t-value)	Standard Error
Constant	1.016 (3.11)***	0.327	0.002 (5.67)***	0.000	0.046 (6.16)***	0.007
SysRisk (-1)	0.270 (4.33)***	0.062	-	-	-	-
UnsysRisk (-1)	-	-	0.051 (0.84)**	0.061	-	-
TotalRisk (-1)	-	-	-	-	0.118 (1.64)**	0.072
RoTA	0.008 (6.68)***	0.001	0.000 (5.57)***	0.000	0.000 (2.90)***	0.000
CR	-0.130 (-1.64)	0.080	0.000 (2.64)***	0.000	0.001 (1.16)	0.001
MktCap	0.021 (0.69)	0.030	0.000 (-2.92)***	0.000	-0.001 (-1.69)*	0.001
PB	-0.006 (-1.91)*	0.003	0.000 (2.08)**	0.000	0.000 (3.23)***	0.000
PE	0.000 (-1.13)	0.000	0.000 (-2.75)***	0.000	0.000 (-1.12)	0.000
AdvInt	-2.771 (-2.38)**	1.164	-0.001 (-0.68)	0.001	-0.044 (-2.21)**	0.020
Div	-0.000 (-3.00)***	0.000	-0.000 (-2.57)**	0.000	-0.000 (-2.16)**	0.000
QR	0.163 (1.54)	0.106	0.000 (-2.88)***	0.000	-0.002 (-1.14)	0.002
MktShare	0.291 (0.74)	0.395	-0.001 (-2.61)***	0.000	-0.013 (-1.96)*	0.007
ACWI	-0.284 (-4.63)***	0.061	0.000 (-4.86)***	0.000	-0.006 (-5.55)***	0.001
GDP	0.031 (2.81)***	0.011	0.000 (-1.82)*	0.000	-0.001 (-4.95)***	0.000
CAB	0.001 (0.09)	0.010	0.000 (4.13)***	0.000	0.001 (10.90)***	0.000
CPI	-0.038 (-3.86)***	0.010	0.000 (-0.73)	0.000	0.000 (2.35)**	0.000
IntRate	-3.284 (-2.50)**	1.314	-0.001 (-0.47)	0.002	0.007 (0.17)	0.040
Wald Chi^2	1384.678, Prob > chi^2 = 0.000		6891.600, Prob> chi^2 =0.000		2508.665, Prob > chi^2 = 0.000	
AR (1)	-3.697, Prob > z = 0.000		-3.011, Prob > z = 0.000		-3.570, Prob > z = 0.000	
AR (2)	1.225, Prob > z = 0.221		-0.680, Prob > z = 0.496		-0.820, Prob > z = 0.412	
Sargan test	33.49, Prob > chi^2 = 0.759		30.01, Prob > chi^2 = 0.645		33.02, Prob > chi^2 = 0.633	

Note: *** p<0.01, ** p<0.05, * p<0.1

Source: Authors

the economy grew, people started spending more on tourism, which reduced the risk for investors in the tourism sector. On the same grounds, when the economy grows, spending shifts from the necessities like the FMCG sector to the luxuries like tourism, which leads to an increase in the risk for investors in the FMCG sector. The hypotheses H9a, H9b and H9c are all rejected. MSCI ACWI significantly affected all the risk measures. This result confirms the volatility transmission between the world financial markets, as explained by P. Kofman and M. Martens (1997). The current account balance as a percentage of the GDP shows a country's openness to trade. The greater value of this measure increased unsystematic risk and total risk. The hypotheses H11b and H11c are rejected, whereas the hypothesis H11a is not rejected. G. Bekaert and C. R. Harvey (2000) also showed that exposure to the global risk factors increased with the increase in trade openness. Furthermore, inflation showed a significant positive relationship with total risk. As per Fisher's theory, stocks provide a hedge against inflation, so stock returns must be positively

related to inflation. With this explanation in mind, the present result can be interpreted in the manner that a rise in inflation increases capital flows to stock markets, leading to an increase in total risk (Patro *et al*, 2002). On the contrary, systematic risk showed a negative association with inflation, thus leading to the rejection of the hypotheses H12a and H12c, but not to the rejection of the hypothesis H12b. The interest rate showed a significant negative association only with systematic risk, not with unsystematic and total risks. The hypothesis H13a is rejected, whereas the hypotheses H13b and H13c are not. Lowering interest rates increases the capital mobility on the financial markets, which makes companies more susceptible to systematic risk (Arfaoui & Abaoub, 2010).

Postestimation tests

After the regression analysis, it is essential that postestimation tests should be done, which includes the AR(1), AR(2) and Sargan-Hansen tests. These tests are performed in order to check the first-order autocorrelation, the second-order autocorrelation and over-identifying restrictions in the model. The outcomes of these postestimation tests are presented in Table 6. As discussed earlier, the models had a problem of the first-order autocorrelation and the same results are shown through AR(1). The findings of AR(2), however, demonstrate that the null hypothesis cannot be rejected; hence the autocorrelation problem is solved at the second level (Arellano & Bond, 1991). In addition to this, the results of the Sargan-Hansen test for all the models fail to reject the null hypothesis, as the p-value is greater than 0.05 (therefore, it is possible to make a conclusion that the used instruments are valid).

CONCLUSION

The present study reiterates the importance of considering unsystematic risk in decision-making. The results show that on average 89.6% of total risk is attributable to the unsystematic portion and the rest is attributable to the systematic portion. This is an interesting finding for the Indian FMCG sector, and investors should not ignore this kind of risk. Furthermore, the present study seeks to demonstrate the factors that affect the different measures of the market risk. Dynamic panel models were used for the empirical analysis. First of all, the fundamental financial information is found to be relevant for investors' decision-making, given the fact that this piece of information affects risk measures, which is critical for investment decisions. The results suggest that both financial variables and macroeconomic variables can be used to gauge the risk related to investments. The results of the present study are coherent with theory. The number of the macroeconomic variables that affect systematic risk is greater than the number of the macroeconomic factors affecting unsystematic risk, whereas the number of the company-specific variables that significantly affect unsystematic risk is greater than the number of those that affect systematic risk. Systematic risk, however, is not solely affected by macroeconomic variables, and unsystematic risk is not solely affected by company-specific variables. Profitability, dividends, the world stock markets, and a country's economic growth are the most significant variables for investors, since these affect all types of risk. Moreover, with the help of results of the present study, marketing personnel can justify advertising expenditure, as well as their other marketing efforts that build their brand value and increase their market share, given the fact that these efforts will reduce risk for investors and increase their wealth.

The results obtained in this study are especially useful for business managers to understand risk and the factors contributing to it. This in turn will help them to observe important information about the cost of capital and the market value of the firm as well. With the help of the findings accounted for in the present study, both managers and investors of FMCG firms may gain useful insights which they can be incorporate in their decision-making process. Now, managers know which financial factors affect their firms' risk measures, so they can try to gain control over such financial measures. Specifically, profitability and dividends significantly affect risk measures, so managers can try to improve these

measures so as to reduce the risk for investors and attract more investors at the same time. Likewise, investors have to carefully evaluate these variables for the FMCG companies they want to invest in. Apart from company-specific variables, investors also have to evaluate the conditions of the world stock markets, as well as a country's economic conditions, through the GDP, inflation, foreign trade and interest rates. Furthermore, investors may use the results of the present study to predict the risk levels of FMCG companies. For the listed companies, beta and the cost of capital can easily be calculated with the help of the available information about the price. For non-listed companies or for new ventures, however, such calculations are impossible. In such cases, accounting information can be used as an alternative to market information. Another implication of the present study is that it supports the efficient market hypothesis by showing that accounting information is impounded in market prices.

There are certain limitations to the present study. As the study uses CAPM, all the limitations of CAPM hold for this research as well. Particularly, the assumptions about perfect capital markets without taxes and the ability to diversify all unsystematic risk are all but true in real life. Furthermore, it is very difficult to measure beta with absolute precision. The model suggests that beta should be calculated based upon the whole of the market, which should include every asset ranging from stocks to bonds, to metals, to real estate, even to human capital. Beta values may broadly vary depending on the measure used for a particular market. The present study used S&P BSE 500 as a proxy for the market. The results are only as good as this assumption. No market index perfectly represents the general market. So, the beta calculated by using a market index may actually fail to capture many factors or elements of systematic risk. Moreover, the limitations of beta are also the limitations of this study. Suppose there are two stocks, A and B, both having the same beta value showing their riskiness in comparison with the market. Allow the stock A to have a higher frequency of downside movements, simultaneously allowing the stock B to have a similar higher frequency of upward movements. Beta does not account for this direction of price movements. Future studies can increase the sample size and they can also include a larger number of variables or different measures of the same variables. Behavioral finance theories have lately been seen as an improvement over traditional finance theories. As suggested by M. Lekovic (2019), the behavioral finance components can be included so as to complement traditional theories, such as modern portfolio theory. So, future studies can further the current work done with behavioral finance components.

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