1. Introduction

Though we consider the relationship between risk and return as part of conventional wisdom that seems to be centuries old, the first forays, however, towards coming up with a statistical model that could explain an asset's price as a function of its inherent risk can be traced back to as late as 1952, to Harry Markowitz and his mean-variance model for selection of efficient portfolios. Markowitz (1952) proposed the "Modern Portfolio Theory" wherein he postulated that constructing an "efficient frontier" of portfolios that offers optimal returns for a certain level of risk is perfectly feasible. He further argued that the individual components of a portfolio must not be scrutinized in isolation but rather be evaluated by how it affects the overall portfolio, in terms of its inherent risk and the expected return. Modigliani and Miller (1958) were pioneers in studying the impact, if any, that the composition of a firm's Capital Structure may have on its value and the conditions which govern those outcomes in their seminal work argue that the firm value is independent of dividend policy and the firm's decision to finance by issuing stock or selling debt. Thus, concluding that valuation is not influenced by the capital structure of a firm. A subsequent research paper along the same lines published Modigliani and Miller (1963) reinforced the aforementioned findings of their previous paper that investment projects are independent of the mode of financing chosen. They also found that the cost of equity funds was only 25 percent higher than that of debt, as opposed to being five times higher as was the common understanding at that point. Furthermore, they add that the benefits of debt financing on shareholder return are small. Since then, a vast amount of research has devoted itself to understanding how capital structure decisions are made and identifying various factors that influence the capital structure of a firm. The two most significant theories to have come about as a result of research into the aforementioned, and that forms the foundation for most of the literature available on capital structure studies, are ones that imply that there is a trade-off involved in capital structure decisions and that such decisions usually follow an order, a

Pecking Order (Myers & Majluf, 1984). A subsequent paper by Myers in July of the same year promulgated a modified Pecking Order to explain the factors that govern a firm's financing priorities and was aimed at the shortcomings that he saw in his previous papers. Another commonly held belief is that managers evaluate the riskiness of a project, estimate cash inflows and then select a source of finance that will maximize earnings per share. Others believe managers have the responsibility to identify the optimal structure of capital that helps in maximizing firm value (Groth & Anderson, 1997). It is safe to say that the capital structure conundrum still remains and opinions are still divided as to what drives a firm to choose a particular mode of financing; whether firms follow a pecking order when choosing a source of finance or do they target a specific debt-equity ratio when taking capital structure decisions. It would also not be an exaggeration to state that the subsequent development of the CAPM was a consequence of the efforts made in this direction by MM and, in particular, Harry Markowitz. It would be safe to assume that Markowitz's mean-variance model helped set the foundation for establishing a relationship between risks and expected returns. Thereafter, Sharpe proposed that a single factor, namely, market risk, could suffice in explaining excess security returns and that risk should be further sub-divided into two components, namely systematic risk and unsystematic risk. Working along similar lines, a general equilibrium, single-index model was developed which postulated a direct relationship between market beta co-efficient and the security's expected return. It is important to understand that this model, that came to be known as the CAPM, is based on two important assumptions. First, that investors are rational, are looking for mean-variance optimization and have similar expectations pertaining to risks and returns in the stock market. Second, the markets are efficient and frictionless. Working with the aforementioned assumptions, the model argued that if investors behaved rationally and were to eliminate all idiosyncratic risks by holding a well-diversified portfolio of stocks, then they would also require a higher return for bearing a higher non-diversifiable risk; hence the

conclusion that the beta co-efficient of the market returns are linearly associated to the expected returns. However, other researchers observed that the additional returns were unproportioned to market beta, in stark opposition to the prevailing view that was the zeitgeist of that time. These findings served as a catalyst for further studies aimed at a critical evaluation of such models.

The CAPM was subsequently tested by Jensen, Black & Scholes (1972) which led to the conclusion that returns were not strictly linearly proportional with market Beta, thus rejecting the traditional form of the CAPM. Similar other contradictions arose from the empirical testing of the CAPM, leading to questions about the adequacy of market beta in explaining excess market returns. Academics argued that the CAPM suffers from mis-specifications, and that there must be other risk factors that affect security returns. Ross (1976) aimed at overcoming the shortcomings of the CAPM by proposing that even though there might be a direct relationship between overall risk in the market and excess mean returns, however, investors may have different expectations of returns for a similar level of risks; postulating that there may exist arbitrage opportunities in the market. According to this theory, that came to be known as the Arbitrage Pricing Theory (APT), expected returns are a function of one or more relevant factors. However, the theory neither specifies the relevant factors nor the size of such factors, thereby rendering it less practical than the CAPM. Banz (1981) conducted a study of stocks listed on the NYSE which showed that stocks of small cap companies gave significantly better returns than large cap stocks. Back then, there was not much of a theoretical basis that could be used to rationally explain this phenomenon and the reasons for it were not known. However, Chan & Chen (1991) argued that size of the firm has a profound impact in terms of risks and returns. Smaller firms generally perform poorly in comparison to their larger peers, thus smaller firms are low on efficiency and as a consequence, are highly leveraged. Thus, the size effect came to be considered as a risk premium, a function of the added risk that investors perceive

to be taking on when investing in companies that have a smaller market capitalization. Since the market index tends to be heavily weighted towards the larger companies, the CAPM fell short on explaining the effect of market capitalization in cross-section of returns among stocks. There were other empirical tests that further proved the insufficiency of the single-factor CAPM in explaining excess returns. Basu (1977) found stock returns to be inversely related to the P/E ratio. Similarly, Litzenberger & Ramaswamy (1979) identified a similar phenomenon, albeit between average returns and the Price-to-Book (PB) ratio. Stattman (1980) lent further credence to the aforementioned observations when he identified a somewhat similar ratio that also exhibited a linear relationship with stock returns. These findings suggested that companies, irrespective of their size, trading at lower multiples of their earnings or their book value generally gave higher returns. Again, in the absence of any sound theoretical foundation, these observations could only lead one to the inference that investors, despite the added risk, saw greater value in companies whose stock price had underperformed in comparison to their peers and that the excess returns were a function of that additional risk. This anomalous behavior later came to be termed as the value effect. Another major anomaly, identified in 1985, was the the tendency of stock prices to continue their trajectory in a certain direction, if they have been moving in that direction in the recent past. The momentum effect generally tends to last for a period ranging between 3-12 months in duration, after which the effect tends to wear off. Additionally, Bhandari (1988) concluded that stock returns and financial leverage exhibit a positive relationship. This relationship continued to hold true even when controlling for firm size and beta, thereby suggesting that the excess returns associated with leverage is not merely some “risk premium”.

These anomalies further strengthened the voices casting doubts on the robustness of the CAPM, thereby ushering in the next phase of research into asset-pricing models, utilizing a multitude of factors. These subsequent models were either modeled on macro-economic factors such as

sudden spikes in interest rates, changes in business cycles, etc., or on company fundamentals like size of market capitalization, book-assets to price, etc.; or were purely modeled on statistics that used factor analysis by extracting factors from historical data. These models brought with them additional explanatory power when compared with the single factor model of the yesteryears. However, models based on micro-economic attributes like the market size, or company earnings, leverage and company-specific factors like the Price-to-Earnings multiple and the dividend yield were the ones to take the cake as far as popular choice was concerned. Thereafter, Fama & French (1992) suggested a model that incorporated three factors after they found convincing evidence that certain characteristics that were firm-specific, like size and value, provide significant explanatory power even when adjusting for market beta using the a methodology proposed in one of their earlier works (Fama & MacBeth, 1973). Subsequent attempts were then made to refine the model using varying methodologies (Fama & French, 1993; 1995; 1996), leading to the rejection of the CAPM and its primary argument about there being a positive relationship between mean excess returns and Beta co-efficient for the market returns. Single-sorted portfolios, ones that mimicked the factors included in the model, namely size and value, were then created and tested against the model proposed by the two academicians. The observations confirmed that fundamentals of a firm, and not just market beta alone, were required to explain the variations that were observed by stock market watchers in returns. An economic justification given for the three-factor model, after attributing randomness in returns to macro and micro-economic shocks, was that behavior of security returns with respect to size, value and market factors acted in consonance with how reported earnings behaved. At around the same time, Jegadeesh & Titman (1993) found strong evidence to suggest that stocks performing in a certain manner over a three-to-twelve-month period continued showing the same performance over the subsequent three-to-twelve-month period. Thus, they identified momentum as an important factor influencing stock returns. Thereafter,

Carhart (1997) endeavored to improvise upon the Three-Factor Model (Fama & French, 1992) by introducing Momentum as an explanatory variable to the aforementioned model. Subsequent studies continued to consistently find strong evidence in favor of momentum having a significant influence over stock returns. Sapp & Tiwari (2004) find evidence from the US mutual fund market that suggests that investors simply chase funds that had good returns in the past. Teplova & Mikova (2015) find evidence from the Japanese market in favor of momentum as a significant influence on stock returns. Lim, Wand & Yao (2018) found a significant and persistent effect of time-series momentum in common stock returns in the US markets for a nearly 100-year period, from 1927 to 2017. Such findings have served to further strengthen voices critical of the Fama-French model, especially those calling for the inclusion of momentum factor so as to appropriate the existing model. Even Fama and French admit and accept that the three-factor model is insufficient at properly explaining short-term momentum profits.

Other studies were conducted to identify factors that could help explain the anomalies in the three-factor model and thus, improve upon the explanatory powers of the model and make it more robust. Fama & French (2006) found that certain firms, like those that exhibit a certain approach towards capital expenditure or those that are highly profitable, tend to give higher returns than others due to the increase in the amount of returns expected by investors from such firms, thereby postulating that these factors might explain anomalies in stock returns. Another study by them offered further confirmation that companies which make moderate investments in asset give higher returns in comparison to firms that are aggressively investing in assets. Thereafter, Fama & French (2007) identify additional anomalies in stock returns pertaining to accruals, investment, net stock issues and operating profits, in addition to the ones that had already been documented in previous research, such as size, and value, along with the lesser favored momentum. Eight years later, they (2015) then use the dividend-discount model as a

primary reason to come up with an asset-pricing model that includes factors that also capture the profitability effect and the effects of investment behavior as well. The aforementioned changes to the Three-factor model were further initiated on the back of the burgeoning evidence provided by Wei, Xie & Titman (2003) and Novy-Marx (2012) among others, which exposed the incapability of the three factors from the earlier FFTF model in capturing stock return variations on account of firm profitability and investment approach. Questions also continue to abound around the persistence of Fama-French to exclude momentum factor from an asset-pricing model despite evidence to the contrary. There isn't much literature that details the results of testing a six-factor model across different markets, let alone one that involves testing the same in the stock market of India. Thus, there is a strong case to be made for testing the existence of a momentum effect in stock returns and to also test whether an asset-pricing model which consists of an additional momentum factor is a better fit than one sans the aforementioned factor. The outcomes from testing of the aforementioned six-factor model will be compared with those obtained from testing of the other relevant models for the Indian market to determine if momentum can also be used to explain variations in stock returns. This study will be immensely valuable to the existing literature and will help us gain a better understanding if various factors included in these models sufficiently capture excess security returns.