International Journal of Management, Public Policy and Research
International, Peer Reviewed journal
E-ISSN: 2583-3014

ASSET PRICING RESEARCH FOR BEGINNERS: SURVEY OF PROMINENT RESEARCH ON STOCK RETURNS AND RETURN DETERMINANTS

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ABSTRACT
Over the last five decades, business academics have identified over three hundred factors that influence stock returns. A newcomer to this field might be overwhelmed by the amount of research and the nature of it - sometimes confusing, even conflicting at times. This paper tries to hand hold a beginner and gently introduce him to the high seas of asset pricing – especially research that focuses on stock returns & potential return determinants. We have tried to cover leading research that will provide a soft landing for the beginner to the field of asset pricing. With this introduction, we hope that the newcomer will find it easier to navigate her/his way confidently to her/his research interest.

Key words: asset pricing for beginners, asset pricing, stock returns, portfolio returns, stock return determinants

1 INTRODUCTION
The 'Dutch East India Company' is believed to be the first company in modern history to issue bonds and shares of firms to public. It got listed on an official stock exchange in the year 1602. And since the listing of the first stock, humankind has strived to identify profitable investment opportunities while trying to minimize the risk of capital loss at the same time. Professor Benjamin Graham and David Dodd of Columbia Business School wrote a book 'Security Analysis' in 1930s. This book can be considered as the first modern day investment guide based on simple but logical analysis of company's financial reports. Since then, significant amount of research in asset pricing has created a rich body of knowledge devoted to understanding the factors that drive returns from stock investments.
Asset pricing researchers have won Nobel prizes on multiple occasions – one in 1990 and more recently in 2013. William Sharpe received the Nobel prize in 1990 for developing the 'Capital Asset Pricing Model' – more popularly known as the CAPM. Eugene Fama, Lars Hansen and Robert Shiller were awarded the Nobel prize in economics in 2013 for their empirical work aimed at understanding how asset prices are determined.

2 ASSET PRICING RESEARCH – CURRENT STATE & CHALLENGES
Asset pricing research involves understanding the cross section of equity market returns. 'Why do returns from one stock investment differ from the returns of another stock' is the primary question researchers have grappled with for decades. 'Capital Asset Pricing Model' (CAPM) has been the cornerstone of asset pricing research. It attempts to quantify the relationship between risk of an asset and its expected return (risk-return tradeoff). Subrahmanyam (2010) calls this risk-reward paradigm as the null hypothesis against which other alternatives are now tested.
If the asset pricing models were totally accurate, the cross section of equity returns seen in the market would align with the model predictions. That is, the stock returns could have been accurately predicted by the behavior of the factors included in the model. However, the asset pricing models are not totally accurate, and this is reflected in the plethora of anomalies that have been reported by other scholars. The anomalies reported usually present empirical evidence of certain factor's influence on asset return – factors that are not a part of the asset pricing model considered. Harvey, Liu, & Zhu (2016) have identified 316 factors from top journals and yet think that this probably underrepresents the factor population that has an impact on stock returns. They also estimate that around 18 new factors are discovered annually creating what Cochrane (2011) calls a 'zoo' of factors. The current challenge

is to explain the anomalies exposed by this 'zoo of factors' and any correlation between them.
This paper looks at some of the prominent literature that has used an empirical approach to improve our understanding of the relation between stock returns and return determinants. We start with papers that studied return determinants related to capital efficiency and its impact of stock returns.

3 CAPITAL EFFICIENCY & ITS IMPACT ON STOCK RETURNS

What is capital efficiency? In simple terms, capital efficiency indicates the effective deployment of capital by an organization with an intent of maximizing returns for the firm. Capital efficiency is measured by different business metrics like RoCE (Returns on Capital Employed), RoA (Returns on Assets), etc. Logically, a firm with higher capital efficiency is better than the one which does not deploy its capital with similar efficiency. And we expect firms with better capital efficiency to provide relatively higher stock returns. In this section, we look at some of the research that explores this logic.
Cooper, Gulen and Schill (2008) have studied the relation between asset growth of a firm and subsequent stock returns. Their findings suggest that events of asset expansion like public equity, debt offerings or acquisitions are followed by abnormally low returns, and events of asset contraction like debt repayments, share repurchases, dividend announcements are followed by abnormally high returns. They also find that the firm's asset growth rate is the strongest determinant of future returns compared to other standard determinants like P/BV, or size, or growth in sales. Hsu, Kalesnik and Kose (2019) report similar findings. In their paper, they have tried to formally define 'Quality' when used as a factor of investing. They have classified various 'quality' factors used by practitioners in different categories like profitability, earnings stability, capital structure, investments etc. They find that 'profitability' and 'investment' related metrics tend to capture most of the quality premium in stock returns. Profitability metrics include return on invested capital (RoIC), return on equity (RoE), return on assets (RoA) and gross profitability whereas investments metrics include 'growth in total assets'. Titman, Wei and Xie (2004) add more insight to the negative relation between asset growth & stock returns. They find that this negative relation between stock returns and increase in capital expenditures tends to be stronger for firms that have higher cash flows or less debt i.e., firms with greater discretion in their investments. Li, Becker and Rosenfeld (2012) have validated the work of Cooper, Gulen and Schill (2008) in international markets and find that the negative relation between asset growth and future stock returns is seen in stocks included in the MSCI World Index (stocks from 23 countries). Like the results of Cooper et al., they also see that total asset growth has the greatest predictive power for stock returns irrespective of country, industry, sample period and size of the stock.
One specific form of asset growth is public offering – be it in form of an IPO (Initial public offering) or SEO (Secondary equity offering), and there is a lot of insightful research studying relationship between asset growth in this form & the subsequent stock returns. Initial work done by Ritter (1991) found that returns from stocks issued in an IPO lagged performance of comparable firms and the market index based on a study covering 1,526 IPOs over a period of 1975 to 1984. Loughran and Ritter (1995) extended this work further - both in terms of scope and the period of study by studying returns from an IPO and an SEO (secondary equity offering) over a period of 1970 to 1990. What they see is that an investor would need to invest 44 % more money in new equity issuers (IPO or SEO) compared to non-issuing companies of similar size to generate similar returns after five years of holding period. One can naturally ask whether the poor returns from issuing companies is a result of reversal-to-the-mean over the long term. However, they find that companies doing very well but do not issue new equity perform way better than companies that were doing very well and issue new equity. They have explored various possible explanations for the poor returns of issuing firms including possible difference in betas. However, the strongest explanation is possible over valuation of new issues - especially IPOs, and investors tendency to bet on longshots - which they see as triumph of hope over experience. Brav and Gompers (1997) have refined this study further by evaluating the performances of venture capital backed IPOs vs IPOs not backed by VCs. They find that IPOs backed by VCs do outperform non VC backed IPOs over a five year period. Another interesting observation from their study is that the underperformance of non-VC backed IPOs is mainly because of performance of small cap stocks – less than $ 50 million. They report a significant reduction of underperformance compared to the benchmarks if the portfolios are value weighted. They also find that the underperformance seen in the study by Ritter (1991) and Loughran & Ritter (1995) is largely because of small & non-VC backed IPOs & portfolios that are equally weighted in their studies. Lyandres, Sun, and Zhang (2008) have come up with a new investment factor that explains a substantial part of the relation between new equity issues and under performance of those stocks. The new investment factor proposed is the ratio of new investments to assets. Going long on low investments-to-assets and shorting high

investment-to-assets earns a significant average return of 0.57% per month for a study conducted over a 36-year period from 1970-2005. Around the same time, Chen & Zhang (2010) proposed a new three factor model that explained anomalies related to momentum, new stock issuances, asset growth & substantially outperformed the traditional asset pricing models. In their model, the difference in expected return on portfolio and the risk-free rate is dependent upon the three factors namely - the market excess returns, the difference between returns on a portfolio with high RoA (return on assets) & portfolio with low RoA, and the difference between returns on a portfolio of low investment stocks and the return on portfolio of high investment stocks. Because of its ability to explain many patterns that are anomalous in the more popular Fama & French multi factor models, the authors believe that this three-factor model has wide applications like computing costs of equity, estimating returns in asset allocation, evaluating mutual fund performance etc.

Empirical evidence that companies that invest more earn lower risk adjusted returns is called the 'capital investment' anomaly. Similarly, there is another anomaly called the 'accruals anomaly' that talks about the negative association between accrual component of the earnings and future stock returns. Are the capital investment anomaly and the accruals anomaly related? Wei and Xie (2008) have tried to look for possible linkages in these two anomalies. Their results show that while both are distinct from each other, they seem to arise out of manager's over optimistic vision about future sales & product demand. They also find that a trading strategy that exploits both these anomalies concurrently outperforms trading strategies based on each of the anomalies individually. Accruals and its impact on stock returns has also been widely researched and we will review some of the important research in that area in our next section.

4 ACCRUALS, CASH AND STOCK RETURNS

Sloan (1996) was the first to study whether stock prices took into account the cash flow component and the accrual component of the earnings. Ideally, stocks with higher cash component & lower accrual in its earnings should be valued higher than the one with a lower cash component of earnings. His primary finding however was that stock prices does not make this distinction and that investors seem to treat all 'earnings' in a similar manner. However, he finds that stocks with higher accruals underperform stocks with lower accruals. Chan et al. (2006) have tried to find the reasons for this negative correlation between accruals and subsequent stock returns. Some of the hypothesis that they have tried to explore relate to earnings manipulation by managers, biases in extrapolation of future growth (incorrect projections of future sales & profits) and failure to act when business conditions change.

Are all components of accruals equally reliable or do accrual components differ in terms of reliability? Richardson et al. (2005) have tried to answer this question and provided a comprehensive categorization of accruals and their reliability. One of their main findings is that less reliable earnings have a higher negative impact on earnings persistence which is not reflected in the security prices. Pincus, Rajgopal and Venkatachalam (2007) have tried to explore if the accruals anomaly is a local US phenomenon because of its accounting norms or is this anomaly seen in other countries as well. They studied stock markets in 20 countries and found the occurrence of this anomaly in only four countries - UK, US, Canada and Australia because these countries extensively use accrual accounting.

So far, we have looked at the negative impact of accruals component of earnings on stock returns. That leads us to a question: Does actual cash held by a firm or cash component of earnings impact stock returns positively? Palazzo (2009) found empirical evidence that a firm's cash holdings are positively correlated with its equity returns. He finds that an investing strategy long on stocks with high cash-to-assets ratio, and short on stocks with low cash-to-assets ratio provides an average excess return of 0.42% per month. Mikhail (2010) reported similar findings between firm's excess cash holdings and returns. He found that firms with high excess cash provided an average of 0.4% higher returns per month compared to firms with low excess cash. Foerster, Tsagarelis, and Wang (2017) present a method to create a disaggregated, direct cash flow estimates & create portfolios based on FCFF/Total Assets. They report that highest decile portfolios outperform those in the lowest by over 10% annually. They also show that cash-based measures have higher predictive power compared to income statement metrics like RoA, P/E or Gross Profitability/Total Assets.

Like accruals, metrics used to categorize growth stocks (high P/E ratio, high P/BV ratio etc.) also have a negative correlation with stock returns. Desai, Rajgopal and Venkatachalam (2004) have tried to investigate if one of them is a manifestation of the other. They find that the ratio of standard financial metric - Cash Flow from Operation (CFO) scaled by price - CFO/P captures the effect of both accruals and glamour anomalies. It seems that in both anomalies, the market is unable to accurately process the accounting information i.e., the accruals component in the earnings or the growth in earnings that the firm can realistically achieve. Another way in which these two accruals are

connected is that growth stocks are likely to have high sales growth which is more likely to result in larger accruals. Asset pricing literature that explores the connections between accounting information and stock returns is also very rich and insightful, and we will try to look at some of that research in our next section.

5 SIZE, P/E, P/BV AND STOCK RETURNS

5.1 Size

Size of a firm measured as its 'market capitalization' (market cap) is known to have a significant impact on stock returns. Banz (1981) was the first one to empirically examine the relationship between market cap & returns of common stocks. He found that smaller firms provided higher risk adjusted average returns compared to larger firms. He also found that 'size effect' is not linear in nature. While the difference between average risk adjusted returns of small & large firms is significant, there is little difference between mid-sized (average sized) and large firms. However, the existence of size effect has been challenged by separate research that claims that the 'size' effect is dependent on how the beta of the stock portfolios is computed. Chan & Chen (1988) find that the 'size' effect vanishes if the period for computation of beta is the same as the period of study, instead of a different sub-period. Similar observations are reported by Handa, Kothari and Wasley (1989), who find that size effect disappears when the portfolio beta is computed using annual data instead of monthly data. Around the same time as Banz's research, Reinganum (1981) also reported observations similar to Banz. For a period between 1962-1975, he created ten size-based portfolios and computed average returns for the subsequent year and the year after that. Like Banz's findings, he also found that risk adjusted returns of portfolios of smallest firms was higher than the risk adjusted returns of portfolios of largest firms by as much as 20% in the year after formation of the portfolios. After two years of formation of portfolios, the different between risk adjusted returns of smallest firms and the largest firms stayed around the same level. Interestingly, 'size effect' continues to get researchers attention even today. Alquist, Israel and Moskowitz (2018) have tried to reaffirm some of the facts of size effect and dispel some of the myths related to it. One of their findings is that the size effect almost disappeared after some of the missing information related to delisted companies was added to the data set. Earlier studies on which the size effect was reported did not have information about these delisted companies and hence the data set was incomplete. This study also reports that returns to size are less stable, less persistent, and less robust when compared to other factors like value, momentum, and quality. The authors of this study go on to claim that while size effect does exist, it cannot be considered a key return determinant or a factor for portfolio construction.

In what seems to be direct challenge to Alquist et al. (2018), Asness et al. (2018) have challenged almost all the findings of Alquist et al. Asness et al.'s central finding is that size as a factor of investing is important, however the quality of stocks in the portfolio of small stocks needs careful attention. They examine seven empirical challenges previously reported for size effect and prove them to be false if the quality of the stocks in the small stock portfolio is controlled. They go on to claim that if quality of the stock is controlled, then size effect is as important as other anomalies like value & momentum - in terms of its robustness and persistence. The author measure firm's quality by accounting metrics related to profitability, growth, stability, and safety. That gives rise to a generic question: If we improve the quality of portfolios for other factors like value or momentum, will it not result in improved performance of these factor portfolios and a significantly higher alpha? We think it will. So, controlling for quality in size effect seems like artificially propping up a midget and make it look bigger & equal to its normally larger factors.

5.2 P/E Ratio and stock returns

One of the early, oft cited research to identify return determinants was published by Basu (1977). In this paper, he has examined the relationship between investment performance of common stocks and their price-earnings (P/E) ratio. He found that portfolios with low P/E stocks earned significantly higher returns compared to the ones that had higher P/E stocks over a fourteen-year period. He also saw that average annual rates of return progressively declined as one moved from low P/E ratio to high P/E ratio portfolios. Moreover, low P/E portfolios had a lower level of systematic risks compared to the portfolios with high P/E stocks – which in fact was contradictory to what CAPM would have predicted. Basu (1982) extended his previous research on the relation between P/E and stock returns to include the impact of firm size. The primary trigger for this work was a study by Reinganum (1981) which stated that the size effect 'subsumes' the P/E effect. Basu used a different database and a different methodology that controlled the effect of risk on returns where as Reinganum's approach on the other hand did not control for any risk (either systematic or total risk) on returns. Basu's study found that low P/E stocks earned higher risk adjusted

returns than high P/E stocks - even after controlling for size (large cap and small cap stocks were randomized across the high P/E and low P/E portfolios). On the other hand, small NYSE stocks earned higher returns than large stocks. However, the size effect disappeared when returns were controlled for P/E ratios and risk. His study states that the strength of the P/E effect seems to vary inversely with the size of the stock i.e., the P/E effect is large for small cap stocks and small for large cap stocks. Commenting on both P/E and size, he sums up that neither P/E nor size appear to drive expected returns, they seem to be proxies for more fundamental determinant of expected stock returns.
Cook and Rozeff (1984) shed further light on the possible interplay of the P/E effect and the size effect. They report that stock returns are related to P/E ratio, size, and the January effect (January effect is an empirically observed phenomenon in which stock prices rise in January for various reasons). They examine the reasons for the different results on the P/E effect & the size effect by Reinganum (1981) and Basu (1982). They say that Reinganum's finding that size subsumes P/E ratio was because of methodological reasons and Basu's findings appear to be sample specific. Cook & Rozeff (1984) examine the interplay of size & P/E effect using nine different methods and three different ways of portfolio formation. They find that three main effects and two interactions within these three effects explain risk adjusted returns. The main effects are P/E ratio, size and the January effect, while the interactions are P/E with January and size with January. The effects of size & P/E ratio are seen throughout the year with approximately half of each effect occurs in January and the remaining half in the rest of the year. Based on his study, he asserts that neither size effect subsumes P/E effect nor vice-versa.
Jaffe, Keim and Westerfield (1989) believe that both Reinganum and Basu's work could not unravel the size & P/E effect partly because of relatively short periods of analysis. They also point out methodological issues in the work of Cook & Rozeff (1984) to analyze these two effects in January and in the rest of the year. They have addressed both these issues by considering a longer sample period from 1951 to 1986 and addressing the methodological drawbacks of the earlier studies. With these changes, they report that size effect was significantly negative only in January, whereas the E/P effect was significant throughout the year.
We see an ongoing research interest in P/E ratio as a return determinant since the first paper by Basu (1977). Trevino & Robertson (2002) have tried to find out if P/E ratios can predict subsequent stock returns. Their regression analysis with P/E ratio as the independent variable and the average 'holding period return' as the dependent variable found that as the holding period increases, the inverse relationship between P/E levels and portfolio returns gets stronger. For one year holding period though, the relationship is not statistically significant. P/E ratios do not seem to have high predictive power for stock returns for smaller holding periods but does have substantial predictive power for holding periods over 5 years. More recently, Park (2021) found that the P/E ratio is inversely related to the future stock returns during a 150-year period ranging from 1871-2020.
Stocks in the same industry tend to bunch together in the same relative P/E ranking. So, when portfolios are formed based purely on P/E basis, stocks of same industry tend to be grouped together - which authors call the industry effect. Critics of P/E effect claim that the difference in returns of different P/E portfolios could be due to the industry effect and not because of the difference in P/E. To address this aspect, Goodman and Peavy (1983) have constructed portfolios based on relative PE ratios - PERs. The PER is the index of P/E ratio of a stock relative to its industry. The low PER portfolios comprehensively outperformed the high PER portfolios confirming the inverse relationship between P/E ratio & stock returns.
As we saw earlier, one of the drawbacks of accruals accounting is the difference between the reported earnings and actual cash inflow in the firm. However, the impact of measurement errors in earnings (including 'earnings management' by the firm) tends to dampen as earnings aggregate over a period. Easton, Harris and Ohlson (1992) used this rationale and proposed a hypothesis that as the period of aggregation of earnings gets longer, the correlation between aggregated earnings & stock returns gets stronger. Empirical findings supported this hypothesis. They found that the correlation between stock returns & aggregated earnings improved with aggregation period. For a 10-year period, most of the returns could be explained by the aggregated earnings. Another interesting remark made by the authors in this paper relates to the return period (holding period). Impact of certain return determinants is different for different holding periods, and hence any study designed to evaluate the relation between the factor and stock returns should also consider the return period.

5.3 P/BV and stock returns

Fama & French (1992), in their study spanning a 50-year period from 1941 to 1990, found that the simple relation between Beta and average returns is weak. However, the same study found a strong relation between average return and size, average return & BV/P (Book Value per share / Price), average return & leverage and average return & E/P

(Earnings per share / Price per share). In this study they have tried to look at joint roles of market beta, the size, leverage, EPS/Price, leverage, and BV/P in the cross section of average returns on NYSE, AMEX and NASDAQ exchanges. The study involved univariate as well as multivariate tests on the relation between returns and the above listed factors. They found inverse relation between size & return, strong positive relation between average returns & BV/P and that BV/P to have a stronger influence on average returns. They also found that for the period of study, the combination of BV/P and size seems to include the influence of E/P and leverage in average stock returns. These observations between size, BV/P and returns are for non-financial firms. For financial firms, Barber and Lyon (1997) have examined the relation between BV/P, size and security returns and find that the relation there is also like non-financial firms. Piotroski (2000) has come up with a simple accounting analysis approach to significantly improve the returns in a portfolio of high BV/P stocks. Ball et al. (2020) have decomposed the book value of a stock into two parts - contributed capital & retained earnings. They argue that 'P/BV' is a good predictor of stock returns because the retained earnings part of the book value aggregates the past earnings (less the dividends paid), which is a strong indicator of the firm's earnings history & a good proxy for earnings yield. Based on their tests, they report that 'retained earnings/price' is a good predictor of returns & that contributed capital has no ability to predict stock returns.

Fama and French (1993) proposed the 3-factor asset pricing model that explains most of the anomalies of CAPM. The three factors are: excess returns on market portfolio over risk free returns, difference between the returns of small stocks portfolio and returns of large stock portfolios (SMB - Small minus Big) and difference between the returns of high BV/P portfolio and returns of low BV/P portfolios (HML - High minus Low).

In times when computing was not as powerful as it is today, Nicholson (1968) carried out an interesting exercise. For a duration spanning 1937-1962, he classified 189 stocks into quintiles of P/E, P/Sales, P/Depreciation and P/BV and tabulated the performance for each group of stocks for holding period ranging from 1 to 7 years. And what should be considered as an astounding discovery for that time, he found that portfolios of low price ratios (low P/E, low P/Sales etc.) comfortably beat portfolio returns of high price ratios (high P/E, high P/Sales etc.). He goes on to remark that attention to stock prices and price ratios might have a bigger impact on investment returns than the significant efforts by analysts in estimating growth or other finer nuances of the firm.

Chan, Hamao & Lakonishok (1991) examined the relationship of stock returns with some of the fundamental metrics like BV/P, E/P, Size & Cash Flow/Price in Japan for a period ranging from 1971-1988. They find that the performance of book to market ratio (BV/P) is the most important of four variables considered. They also saw a strong relation between cash flow yield and stock returns. The size effect was also observed in the Japanese markets.

6 DIVIDEND YIELD, DEBT/EQUITY RATIO AS RETURN DETERMINANTS

In a study spanning 1936-1977, Litzenberger and Ramaswamy (1982) report a significant positive relationship between stock returns and dividend yield. Spanning a much longer study period of 1871 to 2014, Straehl and Ibbotson (2017) found that total payouts i.e., dividends plus buybacks are the key drivers of long-term stock returns. Owen (1998) has explored earnings & dividends as potential predictors of stock returns. Regressing returns on dividend yields and payout ratios, he finds dividends & earnings can help in predicting short term returns, however long-term returns are determined only by current stock prices (& nothing else).

6.2 D/E Ratio and stock returns

Bhandari (1988) in his highly cited paper reports that expected equity returns and D/E are positively correlated. This implies that higher D/E indicates a higher degree of risk for equity holders and that is reflected in the higher expected stock returns. Barbee, Mukherji and Raines (1996) have challenged the role of BV/P or size as return determinants. They find that sales-price ratio and debt-equity ratio explain stock returns better than book to market ratio (BV/P) or the size (market capitalization). This study reports that the sales-price ratio also captures the role of debt-equity ratio in explaining stock returns, thus making sales-price ratio a more reliable return determinant.

7 VALUE INVESTING, GROWTH INVESTING AND STOCK RETURNS

Value investing involves investing in stocks that are trading at a significant discount compared to the underlying value. Low price ratios like low P/E, P/BV, P/Cash Flow, P/Sales characterize value stocks. On the other hand, growth stocks are characterized by high price ratios like high P/E, P/BV, P/Sales etc.

Lakonishok, Shleifer & Vishny (1994) have looked at contrarian investment strategies and their study find that value strategies beat the market. One of the findings of this paper is that value stocks have outperformed glamour stocks

over a period of April 1968 to April 1990. The authors remark that a probable reason for this outperformance is that the actual future growth rates of earnings, cash flows etc. of glamour stocks turned out to be lower than they were projected. This implies that market consistently overestimated the future growth rates of glamour stocks as compared to the value stocks. Using conventional metrics for risk, the study finds that value stocks are not riskier than glamour stocks. Fama & French (1998) report strong evidence of value premium in the markets outside of the US. They studied returns on the market portfolio, the value portfolios and the growth portfolios for twelve major countries (Europe, Australia & the Far East) in addition to the US and find that in portfolios sorted on BV/P, value stocks performed better than the growth stocks in twelve of the thirteen major markets during the 1975-1995 period. They observed similar value premiums when sorted on Earnings/Price, Cash Flow/Price & Dividend Yield.

For the duration between Jan 1979 till Feb 1997, Ibbotson & Riepe (1997) have compared the performance of different value & growth indexes like the Wilshire Large Cap - Growth, Wilshire Large Cap - Value, Barclays Global Investors Small Cap - Growth, Barclays Global Investors Small Cap - Value etc., and find that regardless of the size, every value index outperformed the growth index with less volatility. However, despite value stocks superior performance over growth stocks in the long run, there can be extended periods of under performance by value stocks.

Chan & Lakonishok (2004) have reviewed the literature on value & growth investing and provide new results from an updated sample. The central message reiterated by them is that value investing provides higher returns than growth stocks, and that they are not riskier than growth when measured using the common measures of risk. Returns to value strategy are more pronounced in small stocks and value superiority is seen in many international markets. They have explored the reasons for under performance of value stocks in the late 1990s when growth stocks provided superior returns to value. They infer that the performance of growth stocks in late 1990s was not grounded in economic logic but was driven by exaggerated optimism of investors in TMT (technology, media and telecommunication) stocks.

Brown & Rowe (2007) have looked at the value-growth debate through the lens of capital productivity. They find that positive alpha is generated only in case of value stocks with high RoIC (return on invested capital). Value stocks with low RoIC generate zero alpha. Growth stocks fail to generate positive alpha even when they have a high RoIC.

Asness et al. (2015) have conducted tests using publicly available data to verify several facts and myths of value investing. Some of the facts they verify are that value works best with some of other factors of investing like quality and momentum, and that it is weak in large cap stocks. They also reaffirm that value can be measured by different metrics like P/E, P/BV, Cash Flow/Price and dividend yield. They find that portfolios created using an average of multiple measures result in a better-stable portfolios compared to portfolios created using a single value metric. This, they say, is because averaging helps in reduction of errors related to measurement of individual metrics.

Penman and Reggiani (2018) have come up with a mathematical formulation to link E/P, BV/P and expected RoE for a stock. This formulation helps in identifying 'value traps' in value stocks. Additionally, their research also explains why BV/P is good for predicting returns in small cap stocks, but E/P is more effective in predicting returns for large cap stocks.

8 OTHER ACCOUNTING METRICS AND STOCK RETURNS

Abarbanell & Bushee (1998) have used a bunch of fundamental accounting metrics to create portfolios that generate significant abnormal returns. These accounting metrics related to changes in inventories, accounts receivables, gross margins, selling expenses and capital expenditures.

Quality of stocks i.e., metrics that measure quality & its impact on the cross section of stock returns has also received a lot of attention in recent times. Asness, Frazzini, and Pedersen (2019) defines quality as an attribute that makes investor pay a higher price for. In an empirical study spanning U.S. stocks from 1957 to 2016, and a sample of stocks from 24 developed economies from 1989 to 2016, they find that a quality-minus-junk (QMJ) factor that goes long on high-quality stocks and shorts low-quality stocks earns significant risk-adjusted returns in the United States and across 24 countries.

They also report that quality stocks are low beta & that they benefit from flight to quality, i.e., they tend to perform well during times of extreme market distress. They have grouped the metrics that define quality into 3 main categories i.e., profitability, growth and safety. Metrics in profitability include gross profits-over-assets, RoE, RoA, cash flow-over-assets. Growth is measured as prior five year growth in the profitability measures. For measuring safety, they consider measures like market beta, volatility of profitability measures, low leverage & bankruptcy risk measures like Altman's Z.

9 MOMENTUM AND STOCK RETURNS

Jegadeesh and Titman (1993) discovered that investors can generate significant positive returns for a 3 month to 12 month holding period by buying well performing stocks and selling stocks that have performed poorly in the past. For stocks listed on NYSE and AMEX between the period 1965 to 1969, they selected stocks based on their past 1 to 4 quarter returns and held it for different holding periods ranging from 1 to 4 quarters. For the strategy examined in most detail (stocks selected based on past 6 month return & held of 6 months), they find that it gives an average risk accounted excess return of 12.01% per year. However, they also find that these returns are not permanent, and that half of the excess returns dissipate with the following 24 months.

Why does momentum strategy work? Chan, Jegadeesh, and Lakonishok (1996) explain it as markets under reaction and/or gradual reaction to information that impact stock returns. They also caution that since momentum strategy is trading intensive, actual returns realized could be significantly reduced because of high trading costs. Rouwenhorst (1998) verified the presence of momentum in 12 European countries and found that momentum strategies provide profits similar to those in the US.

Jegadeesh and Titman (2001) have looked at different explanations for profits derived from momentum strategies. Their primary finding is that profits from momentum strategies continued well after they initially reported their findings, thus ruling out the possibility of data snooping. They update their earlier explanation that momentum strategies are profitable because of delayed over reactions to important news which are reversed eventually.

Eighteen years after their first paper about the profitability of momentum strategies, Jegadeesh and Titman (2011) have reviewed the literature since their publication for possible explanations for this phenomenon. However, they find that most of the explanations revolved about behavioral aspects of the market. After Jegadeesh and Titman (1993) first published their findings on momentum phenomenon, we think the second most important work on momentum phenomenon was done by Asness et al. (2014). Their paper tries to dispel some myths about momentum strategy using academic papers, and empirical tests on publicly available data set.

10 CONCLUDING REMARKS ABOUT LITERATURE REVIEW

As we come to the end of this paper, the perceptive reader might feel that certain important or interesting studies in asset pricing or factors influencing stock returns are not specifically reviewed here. But it is very difficult to cover all important research that has seen some seminal work over a period of five decades & hence some injustice is unavoidable. We feel our primary goal here has been reasonably accomplished as we have been able to present to the beginners all important past & current empirical research on factors that influence or determine stock returns.

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