Recent Trend of Size Premium: A Meta Analysis

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The appreciation of style investment exists because, ultimately, the true ideology is to measure the performance of the portfolio- how efficiently the investment is conducted and how well the risk and return correlation is benefiting. Since the early 60s, there have been several literatures on performance management, among them the most popular is the Capital Asset Pricing Model (CAPM) of William Sharpe (1964) and John Lintner (1965). The fascination of the CAPM is its robustly simple rationality and subliminally pleasing predictions about how to measure risk and its relationship with the expected return (Fama and French, 2003). CAPM endeavours to enumerate the relationship between the beta (systematic risk) of an asset and its parallel expected return. The standard Capital Asset Pricing Model (CAPM) is simple, perceptive, and substantiated in sound economic theory. Yet almost half a century's worth of empirical testing has so far failed to validate its significance. One major reason given for the CAPM's empirical failure is that beta is not the exclusive measure of systematic risk. Empirical research identifies numerous firm characteristics associated with realised stock return, firm size (Basu 1981; Reignganum keim), book-to-market equity ratio, stock price momentum.

In 1981, Banz first documented the association between firm size and realized stock returns. He demonstrated that, on average, smaller firms tend to have higher risk-adjusted returns than larger firms. Reinganum (1981) expanded on this idea, contributing evidence that portfolios sorted by firm size earned higher expected returns than those predicted by the CAPM. The "size effect", i.e., the tendency of low market capitalisation stocks (i.e., "small stocks") to yield

higher returns than high market capitalisation stocks (i.e., “large stocks”), has been subsequently tested in a wide range of markets and over different time periods. Firm size is a common factor in all major empirical pricing models. Furthermore, survey evidence suggests that firm size is one of the most common characteristics that chief financial officers (CFOs) consider when estimating the discount rate for investment appraisal (Graham and Harvey 2001, Table 4). Thus, the effect has a profound impact on the cost of capital estimation in financial practice.

Despite having such profound impact on the estimation of the cost of capital, size effect involves some criticism as well. Keim, 1983 established the presence of size premium, however in his study he demonstrated the existence of pronounced size effect in January than in any other months. Further, Hur et. Al (2014) confirms the existence of size premium in January regardless the state of the market. Apart from January, size effect is only prominent in down or bear markets. The size effect appears to vary across different regions (Astakhov et al., 2017) and time (van Dijk, 2011). It is primarily condensed in the very smallest stocks (Banz 1981). When the smallest 1% of stocks are excluded from the analysis, the negative relationship between firm size and realized returns often reverses (Knez & Ready, 1997).

The issues outlined above raise questions about the rationality of the size effect as a proxy for risk in asset pricing models in recent times. Many scholars have concluded that the size effect died after the early 1980s. Van Dijk, 2011, contended that the theory of the size effect's extinction is premature and that further empirical research is necessary to evaluate the size premium's resilience in the US and around the world. Research is still significant even if the size effect has weakened or faded because it is unclear what component or factors are responsible for this phenomenon (Crain, 2011). Understanding whether the inverse relationship between company size and higher expected returns results from incorrect statistical assumptions, non-representative samples, flawed methodology or other sources of bias is therefore crucial. Thus, it is important to examine the consistency of the underlying causes that perhaps are responsible for the association

between firm size and the expected return; and whether they are consistent in various time periods, regions and data sets. It is crucial to investigate whether the underlying factors that may be in charge of size premium are consistent throughout different time periods, geographical locations, and data sets.

To address the criticism outlined above, a meta-analysis will be carried out to comprehensively accumulate and appraise the wider range of previous studies. This will involve examining the uniformity of the findings across different contexts, considering the plausibility of competing explanations, and assessing the legitimacy of using firm size as a factor in asset pricing in recent times. Gaining a deeper understanding of how firm size influences asset pricing is essential for advancing our knowledge in finance and holds significant implications for the evolution of financial theory.

The remainder of the paper is organised as follows. Section 2 discusses methodology and the data sample, Section 3 presents the empirical results, and Section 4 concludes the paper.

Methodology

Banz (1981) first documented the presence of size effect in the US stock returns. Banz reported that the stocks in the quantiles comprised of smallest market capitals earned higher risk-adjusted return than the firms with high market capitalisation. Multiple studies use a cross-sectional regression of (excess) individual or portfolio-sorted stock returns on a size used by Banz (1981). The market value of equity (the number of outstanding shares times the share price) is a common proxy for size; academics typically log-transform this metric because it is right-skewed and bounded by zero. Fama and French (1992) established a regression specification that is frequently employed in many literatures. This specification involves regressing returns on factors instead of firm-specific variables, as in the case of the Fama-French three-factor model. The sign and magnitude of the regression slope for the variable SMB, which denotes the excess returns of a small market cap stock portfolio over a large market cap stock portfolio, are used in this instance to quantify the size impact. Another widespread technique to estimate the size effect is to pre-sort stocks into portfolios based on individual firm characteristics like size, beta, book-to-market ratio,

and directly compare the returns of the smallest and the largest quintiles of stocks (Astakhov, 2017). This simple comparison method is not suitable for the purpose of meta-analysis since they do not report standard error or t-statistics for the difference in returns.

Fama and MacBeth (1973) devised the so-called two-pass regression technique, often known as the FM regression, which is used in most of the research that regress stock returns on market value of equity to assess the size effect. In numerous studies, the FM regression technique is implemented to address the cross-sectional elements of stock returns, in particular size effect. To be part of the analysis in this research, we only considered studies that estimates the size effect by the FM regression technique.

From the matched studies, the size effect and the standard errors are collected. In case a paper includes the t-statistic instead, we use the following formula to estimate the standard error for the reposted point estimate in this case the size effect:

$SE=\sigma nSE=\sigma n$

Once the estimates are collected, the data will be used to test for selective reporting biases. In an unbiased scenario, the reported estimates and their standard errors should be independent. However, In the presence of selective reporting bias, studies with larger standard errors (often from smaller sample sizes or less precise estimates) are more likely to report significant findings due to selective emphasis on statistically significant results. A correlation between the magnitude of the effect size (reported estimate) and its standard error suggests selective reporting or publication bias (Egger et al, 200To visually emulate the presence of publication bias a funnel plot will be produced by linear regression method in which the standard normal deviate (estimate divided by standard error) regressed against precision (inverse of the standard error) (Sterne et al, 1999).

The regression is estimated using various techniques. The standard error is regressed using OLS to identify the reporting biases in the publications. The aim is to understand whether the biases are outcome of the period of data used, the geographical region, or the selection of data universe. Furthermore, the errors will be regressed to identify the

significance of the presence of survivorship biases and behavioural factors to be the factors to influence these biases.

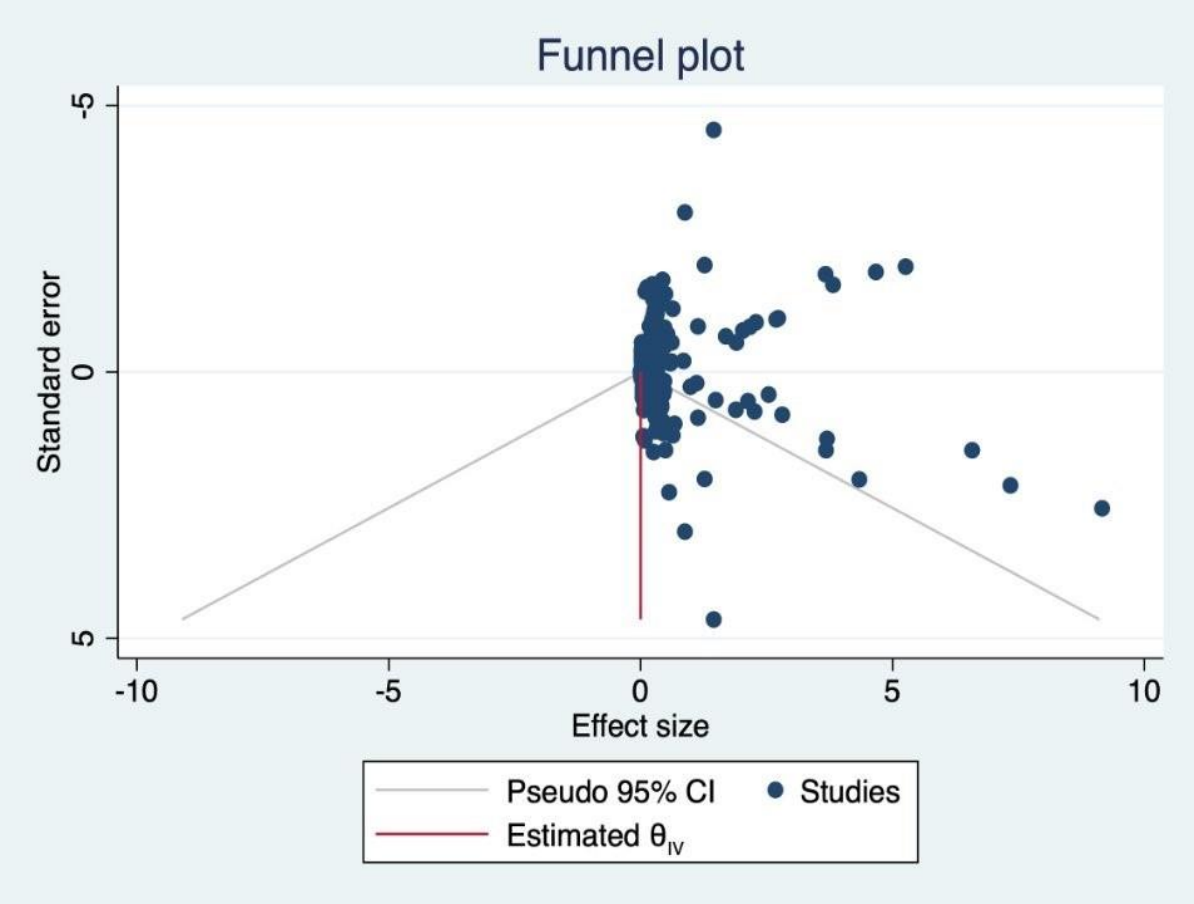
Data

Initially, a Google Scholar search was conducted using key words like size OR small, effect OR premium, size small stock firm returns risk empirical regression portfolio sort effect premium "market value" OR "market capitalization". From the google search completed, the articles selected based on number of factors. First, the articles included will be no later than 1981, when the first size premium was established by Banz. Since the peer-review process acts as a quality control mechanism for journal publications, we focus exclusively on estimates reported in published studies. This ensures that our analysis is based on findings that are more likely to have a meaningful impact on research. Further, more studies were selected using the snowball technique.

After the first screening, the articles will be reviewed based on the value of the size. To be included in the dataset, a study must provide a point estimate and t-statistic or a standard error of the regression of returns on a natural logarithm of the market value of equity. For this research we will be only accepting papers with size premium calculated using regression following the principle of Fama MacBeth.

Results

The results show a heavily skewed funnel plot, indicating the presence of publication biases.



The right skewed funnel plot is an indicator of the presence of publication bias in the deducing the size premium.

The regression analysis between variables also reveals significant p-values, demonstrating how these studies have influenced the identified premiums.

Conclusion

A simple funnel plot test has established the ideology of the biasedness in demonstrating the size premium in publications. Further tests will be conducted against multiple variables to examine this notion further.