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The Size Premium Is 35: Has It Grown Up?

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It is approximately 35 years since Dr Banz published his seminal article identifying that, adjusting for risk, investors might require additional returns for investing in the shares of small companies.[1] Since then, the size premium has become a familiar concept in valuation practice. Many practitioners routinely incorporate such a premium when using a discounted cash flow (DCF) analysis to value 'small' businesses in a range of contexts, including for the assessment of losses in arbitration and litigation. However, the size premium is a contentious matter and the body of evidence about whether it exists and, if so, what causes it, has evolved considerably since Dr Banz's original article.

All else being equal, applying a size premium will increase the discount rate and reduce the value of the losses. In some cases, the extent of the reduction in the value of losses can be substantial.

Two recent investor-state arbitrations in which disputes over the size premium featured were: *Railroad Development Corporation v Republic of Guatemala* (ICSID Case No. ARB/07/23) (*RDC v Guatemala*);[2] and *Guaracachi America Inc. and Rurelec Plc vs The Plurinational State of Bolivia* (PCA Case No. 2011-17) (*GA & Rurelec v Bolivia*).[3]

In the *GA & Rurelec v Bolivia* matter, the losses were approximately US$30 million[4] higher if no size premium was applied (as proposed by the claimants' expert) than if a size premium of 6.28 per cent was applied (as advocated by the respondent's expert). To put this in context, the overall award was US$28.9 million plus interest.

My colleagues and I also see size premiums applied in commercial arbitrations. Again, the impact on discount rates (and therefore losses) can be substantial.

In this article, I discuss the size premium and some of the debate surrounding it. Throughout the discussion, it is worth bearing in mind that some valuers and experts apply size premiums to all but the very largest businesses. Small companies in the context of this debate can be large multinational businesses, and the majority of claims in both treaty arbitration and commercial arbitration are likely to relate to businesses that, at least in principle, might attract a size premium.

CAPM and the size premium

An important component in most discount rate calculations is the cost of equity. The cost of equity is the return that investors require for holding shares (equity) in the relevant company. This required return is frequently calculated using the capital asset pricing model (CAPM).[5]

For those that apply it, the size premium is typically treated as a modification to the CAPM, whereby the cost of equity is calculated as the total of a CAPM estimate plus a size premium estimate.

CAPM posits that investors require a return for market risk and that different assets have different degrees of exposure to market risk. This exposure is measured by a term called 'beta': the higher the beta, the higher the rate of return that an investor will require (and hence the higher the discount rate that should be applied in a DCF calculation).

There is considerable evidence that, on average, smaller companies have higher betas than larger companies (that is, smaller companies tend to be more exposed to market risk). Table 1 presents the average beta of companies ranked by size: as the size of the company declines, the beta increases.

Table 1: Beta by company size

Size portfolio	Beta
1 (largest)	0.91
2	1.03
3	1.10
4	1.13
5	1.16
6	1.19
7	1.24
8	1.30
9	1.35
10 (smallest)	1.40

Source: Table 7-6 of 2014 Ibbotson SBBI classic yearbook.
Note: Calculated using data from 1926 – 2013 from companies listed in the United States of America.

There is also considerable evidence that shares in smaller companies have, over time, generally generated higher returns than shares in larger companies. If an investor had invested £1 in the wider UK stock market[6] in 1955 and reinvested subsequent dividends then, at the end of 2014, that investment would have been worth approximately £1,000. However, if in 1955 the investor had instead invested in UK micro-cap stocks (the smallest 1 per cent of companies) then the investment would have been worth approximately £24,000 at the end of 2014.[7]

On first inspection, the fact that smaller companies have higher betas and generate higher returns appears to be consistent with what the CAPM predicts: if smaller companies have higher exposure to market risk (measured by beta) then, per the CAPM, investors should require a higher return from investing in them.

However, Dr Banz found that beta only explained part of the higher returns that small company shares generated. After allowing for beta, he found that investors had historically achieved an additional return from holding small company shares.

The ex-post observation by Dr Banz (and others) that investors in small company shares had achieved a risk-adjusted additional return led some commentators to posit that investors must, ex-ante, require an additional return for investing in small company shares.

In this article, I use the term 'size premium' to refer to the additional returns shareholders in small companies require after allowing for the higher beta of small companies. I also use the term 'small stock premium' to refer to the additional returns shareholders require for investing in small company shares instead of large company shares (this additional return is not adjusted for beta).

Evidence regarding the size premium

The evidence regarding the existence of a size premium tends to focus (as Dr Banz's paper did) on the returns that shareholders in listed companies have historically achieved. Typically, researchers use statistical analysis[8] to test whether, after controlling for exposure to market risk (measured by beta), there is reliable (ie, statistically significant) evidence of a relationship between stock returns and company size.

Those studies that have found statistically significant evidence that investors achieved a size premium have typically relied on data from before 1981 (the year that Dr Banz's paper was published). However, tests performed on data from after 1981 have found that there is no longer a statistically significant relationship.[9] Furthermore, Professors Dimson, Marsh and Staunton found evidence from a number of countries that the small stock premium turned negative after evidence of a positive premium was published.[10]

The change in the data after 1981 has led some academics to question whether investors do actually require a size premium. They posit that the phenomenon that Dr Banz identified may have been a market inefficiency that disappeared once investors became aware of it:[11]

> *it is possible that investors, beginning in the early 1980s, became aware that small stocks outperformed other segments of the stock market. As investors bid up the prices of small firms, their average return declined. That is, there may have been misvaluations in the market for small firms relative to large firms in the 1960s and 1970s. However, as investors became aware of the mispricings through academic research, the size effect disappeared.*

The notion that the size premium is a historical anomaly is not universally accepted. Prior to the publication of Dr Banz's paper, the relative returns generated by small and large company shares fluctuated over time, with small companies occasionally underperforming large companies.[12] Some commentators consider that it may be coincidence that small companies have underperformed following the publication of Dr Banz's paper, and that the size premium may reassert itself once more time passes.

It is fair to say that the debate is ongoing about whether or not the evidence demonstrates that investors require a size premium. When the size premium is an important issue in dispute, it is therefore important that the extent of that debate is brought to the attention of judges and tribunals.

Why might investors require a size premium?

Although Dr Banz found evidence that investors historically achieved a size premium, he did not provide a theoretical explanation for why such a premium might be required. On the contrary, he stated:[13] 'There is no theoretical foundation for such an effect... Until we find an answer, it should be treated with caution.'

Dr Banz also questioned 'whether size per se is responsible for the effect or whether size is just a proxy for one or more true unknown factors correlated with size'.

The theoretical basis for the size premium may have important ramifications for whether and, if so, how that premium should be applied in assessing losses. It can therefore be important for valuation evidence to address why investors might require an additional return for investing in smaller companies.

There appears to be a consensus amongst academics that the size premium (if it exists) is caused by higher transaction costs associated with investing in the shares of smaller companies. Other explanations (such as bankruptcy risks) have been provided for the size premium, but these have less widespread acceptance.[14] Consistent with this, the explanations for the size premium provided by some textbooks only cover transaction costs.[15]

Academics have identified two different transaction costs that may account for the size premium: information costs and illiquidity.

Information costs

Obtaining and analysing information on companies is costly. Some commentators have argued that investors' information costs are higher for small companies than large companies. Two principal reasons are given for this. First, there is often less information available for small companies. Analyst reports are an important source of information regarding listed companies. In Table 2 below, I present evidence showing that smaller listed companies are less likely to be covered by investment analysts than larger listed companies.

Table 2: Analyst coverage by company size

	Micro-cap	Small	Mid-cap	Large
Percentage of companies in size category covered by analysts	23%	70%	80%	98%
Average number of analysts covering each firm in size category	0.6	4.0	11.0	23.0

Source: Figure 9.6 of 'Investment Philosophies', second edition, by Professor Damodaran.
Note: Values read off of graph.

Second, it can be harder to achieve economies of scale on the research effort for smaller companies than for larger companies. Small companies are by definition of a smaller scale than large companies, and this can mean that the extent of the investment that an investor can make is less for smaller companies.

Illiquidity

Illiquid shares are shares that cannot be sold quickly at the quoted or advertised price (where available) at little cost. Transaction costs associated with illiquid shareholdings include:

- a large 'bid-ask spread' – the difference between the share prices quoted (for instance, by a broker) for an immediate sale (bid price) and an immediate purchase (offer price);
- a price impact caused by trading the shares (with investors pushing the price up when buying the shares or down when selling them); and
- the opportunity cost while waiting for a party with whom to trade the shares.

Investors require an additional return to hold illiquid shares in order to offset the additional transaction costs associated with such investments.

There is evidence that shares in smaller companies are less liquid than shares in larger companies. In Table 3 below, I present the bid-ask spread as a percentage of the share price by company size: as can be seen, this spread was calculated to be significantly greater for the smallest companies compared with the largest companies.

Table 3: Bid-ask spread by company size

Size portfolio	Average bid-ask spread as percentage of share price
1 (largest)	0.5%
2	0.7%
3	0.8%
4	1.1%
5	1.5%
6	1.9%
7	3.0%
8	4.1%
9 (smallest)	6.6%

Source: Table I of 'Trading Cost: The critical link between investment information and results', 1983, Financial Analysts Journal, Thomas F. Leob.
Note: This study was performed at a similar date to Dr Banz's 1981 paper.

Dr Abbot (an associate professor of finance at the West Virginia University College of Business and Economics) found that 'liquidity differences can explain a very substantial part of the differences in returns between small and large' companies.[16]

The relationship between illiquidity and the size premium is important, and anyone applying the size premium should be mindful of this. As Professor Damodaran (a professor of finance at the Stern School of Business at New York University) explains:[17]

> *Don't discount multiple times for the same factor. Thus, if you increased the discount rate for a firm, because it is illiquid, you cannot discount the value of illiquidity. (Hint: You may be doing this if you incorporate a small cap premium into your discount rate and then proceed to reduce the value by an illiquidity discount).*

Approach used in practitioner material to estimate the size premium

Two studies that valuers commonly rely on to estimate a size premium are Duff & Phelps's Risk Premium Report (RPR)[18] and Morningstar Ibbotson's Stocks, Bonds, Bills and Inflation yearbook (SBBI).

There has been much debate among practitioners about which of these two sources provides the better measure of the size premium. There are similarities between how these publications calculate size premiums, and also important differences.

A discussion of the relative merits of the publications is outside the scope of this article. However, one point that is sometimes omitted in a discussion of which publication should be preferred is the overall approach that both studies apply. Both studies[19] calculate the size premium as the difference between actual returns from the shares in a given size 'ranking'[20] and a CAPM estimate of the returns for those shares.

The approach applied by the SBBI and RPR is therefore to identify the difference between actual returns and returns predicted by CAPM, and then to attribute all of this difference to the size premium. As a consequence, this approach implicitly makes two potentially contentious assumptions. First, it assumes that investors do in fact require a size premium. As explained earlier, some commentators consider that the evidence that investors require a size premium is weak – for instance, because studies using data from after 1981 have not found statistically significant evidence that investors have achieved a size premium.

Second, the SBBI's and RPR's approach assumes that the size premium is responsible for the entire difference between actual returns and the returns predicted by CAPM. Where studies (such as Dr Banz's) have found statistical evidence of a size premium, they found that the CAPM and company size together only explained a portion of the variation in actual returns.

Even if one considers that investors do require a size premium, there is a risk that the SBBI and RPR overestimate it by attributing all of the difference between achieved returns and the returns predicted by CAPM to size.

Concluding remarks

The size premium has been the subject of much debate since it was first identified approximately 35 years ago. Questions about whether investors actually require a size premium and, if so, how best to account for it in a valuation are not settled.

The application of a size premium can have a large effect on the quantification of losses. Where a size premium is an important issue in dispute, it is important to explain the full scope of the debate about whether it exists and, if it does, what it represents and how it should be applied.

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Notes

1 'The relationship between return and market value of common stocks', *Journal of Financial Economics*, 1981, Rolf W.Banz.

2 In *RDC vs Guatemala*, the Tribunal applied a size premium, preferring the higher premium proposed by the respondent's expert (see paragraphs 274 and 271 (b) of the judgement).

3 In *GA & Rurelec v Bolivia*, the Tribunal applied a premium of 4.5 per cent, but noted that 'while similar in its effects to... [a] 'size premium', [it] might be more appropriately called an 'illiquidity premium' or better yet an 'additional risk premium', as it also encompasses some aspects that the Tribunal considers relevant among those discussed by the Parties...' (see paragraph 594 of the judgment).

4 Calculated using the Excel model relied on by the Tribunal to determine compensation, as provided at www.pca-cpa.org/showfile.asp?fil_id=2507.

5 Based on their survey of chief financial officers of US companies, Professors Graham and Harvey found that approximately 75 per cent of respondents used the CAPM ('The theory and practice of corporate finance: evidence from the field', *Journal of Financial Economics*, 2001). Although widely used, the CAPM is still subject to considerable debate.

6 Similar results are observed in stock markets of other countries, including the United States of America (see Credit Suisse Global Investment Returns Sourcebook 2015, page 45).

7 Credit Suisse Global Investment Returns Sourcebook 2015, Chart 18 on page 44.

8 Researchers typically use regression analysis.

9 See, for instance, Exhibit 1 of 'September 2012 Duff & Phelps Update', published by Business Valuation Resources.

10 Figure 9-7 of 'Triumph of the Optimists: 101 years of Global Investment Returns', Professors Dimson, Marsh and Staunton.
11 'The disappearing size effect', *Research in Economics*, 2000, Professors Horowitz, Loughran and Savin.
12 See, for instance, Exhibit 3 of 'September 2012 Duff & Phelps Update', published by Business Valuation Resources.
13 'The relationship between return and market value of common stocks', *Journal of Financial Economics*, 1981, Rolf W.Banz.
14 For a discussion of other explanations for the size premium, see 'Is Size Dead?', *Journal of Banking & Finance*, 2011, Professor van Dijk.
15 See, for instance, chapter 9 of 'Investment Philosophies', second edition, by Professor Damodaran.
16 'Size and Liquidity Premiums: Proportional Roles', Dr Abbot, presentation accompanying webinar hosted by Business Valuation Resources, LLC on 15 January 2013.
17 'Diversification, Control & Liquidity: The Discount Trifecta', presentation given by Professor Damodaran.
18 Following the 2013 edition, Duff & Phelps ceased to publish the RPR as a standalone publication. Instead, the data from the RPR is published (along with other information) in Duff & Phelps's Valuation Handbook.
19 See, for instance, page 24 of 2011 RPR and Table 7-6 of the 2014 edition of the SBBI.
20 Both studies rank companies into different size portfolios before then calculating a size premium for each portfolio.

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