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The smallest firm effect: An international study

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A B S T R A C T

Using a carefully screened and filtered international database with a wide coverage across countries and size classes, this paper identifies and documents a post-1980s size effect which is persistent, not picked up by a Fama–French-style SMB, and largely due to the smallest-decile stocks. We test for potential explanations (such as market risk, infrequent trading, financial distress risk, missing book values, momentum, liquidity risk, changing business conditions, January effect, exchange risk, time-varying risk loadings and dividend yield effects), but none can quite explain the international size effect, whether separately or jointly. Fully identifying the missing risk factor is beyond the scope of this paper but we do find that dividend yield shows up as a significant characteristic in the cross-section of risk-adjusted returns, even after controlling for time-varying risk loadings linearly related to dividend yield. When we construct two ad-hoc risk factors that jointly capture the documented size effect, and then correlate these factors with characteristics-based portfolios, we likewise find that especially dividend yield seems to play an important role in the missing risk factor. More generally, this paper revives the debate on the small-firm effect and, we hope, will stimulate further research on a class of stocks that are too interesting to ignore.

1. Introduction and summary

Since the late 1990s, research on the size effect has been characterized by two developments that constitute a remarkable paradox (van Dijk, 2011). On the one hand, theoretical models have emerged in

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which the size effect arises endogenously (Berk et al., 1999; Gomes et al., 2003; Carlson et al., 2004). Simultaneously, however, the more recent empirical studies have raised doubt about the robustness of the size effect as of the early 1980s, a development that has brought a virtual halt to empirical research on the topic.

Perhaps the new consensus about the demise of the small-firm effect was premature, though. First, stock returns being very noisy and standard errors around estimates of the size premium large, it is not easy to tell whether the size effect is larger or smaller than it used to be. Second, international studies have often differed substantially in longitudinal and cross-sectional coverage, so that it is difficult to interpret results from alternative data. Third, while most of the U.S.-based evidence does rely on the same superb-quality database, CRSP, this source does not cover OTC stocks and therefore may miss part of the action. Compounding this, researchers have often actively filtered out the smaller firms present in their database, even though Banz's (1981) evidence suggests that the size effect is not linear in the size ranking and is most pronounced for the smallest firms. It is true that the micro-cap stocks often suffer from severe data problems, and it is difficult and time-consuming to distinguish genuine returns from errors. Still, careful screening and filtering of the data[1] may be a better solution than either blindly trusting the data or removing all smallest-stock returns *a priori*. Thus, while we still ignore the absolutely tiny firms and the penny stocks, we nevertheless use a lower hurdle than other studies and, therefore, study a wider spectrum even for the U.S.; and we add international data (39 countries), all for the same period (1980–2009) and all subject to the same filters.

Besides documenting the size effect in a wide-coverage and clean international database, we also systematically test potential explanations of the size effect. We find that the size effect is still very much present in the post-1980s period and that it is largely confined to the smallest-decile stocks. The potential explanations for the size effect that we tested are: market risk, infrequent trading, financial distress risk, missing book values, momentum, liquidity risk, changing business conditions, the January effect, exchange risks, time-varying risk loadings and dividend yield effects. We find that these effects do not subsume the size effect, either separately or jointly. Fully identifying the missing risk factor is beyond the scope of this paper but we do find that dividend yield shows up as a significant characteristic in the cross-section of risk-adjusted returns, even after controlling for time-varying risk loadings linearly related to dividend yield. In an attempt to get some further insight into the missing risk factor, we construct two ad hoc risk factors that do capture the international size effect jointly, and we correlate them with characteristic-based portfolios. We find again that dividend in particular yield seems to play an important role in the missing factor.

The remainder of the paper is organized as follows. We briefly review the literature on the small size effect in Section 2. In Section 3 we describe the dataset and the screening and filtering procedures. Extensive descriptive statistics of the sample and the portfolios follow in Section 4. In Section 5 we systematically investigate the potential size premium explanations and test them formally, both separately and jointly. Section 6 has a closer look at the missing factor. Section 7 concludes.

2. Literature review

In this section we briefly review the existing evidence on the size effect and the potential explanations of the size premium.[2]

2.1. Early U.S. evidence

Banz (1981) provided the first systematic evidence of a size effect in U.S. stock returns. Studying all common stocks listed on the NYSE between 1936 and 1975, Banz reports that stocks in the quintile portfolio with the smallest market capitalization earn a risk-adjusted return that is 0.40% per month higher than the remaining firms. Fama–MacBeth-style (1973) regressions show a negative and significant relation between returns and market value. However, Banz finds that the size effect is not

[1] See Ince and Porter (2006) for a review of many of the problems in the Reuters/Datastream files.
[2] For an excellent review, see van Dijk (2011), on which we occasionally draw.