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Resurrecting the size effect: Firm size, profitability shocks, and expected stock returns

Kewei Hou, Department of Finance, The Ohio State University

Mathijs A. van Dijk, Rotterdam School of Management, Erasmus University

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Resurrecting the size effect: Firm size, profitability shocks, and expected stock returns

Kewei Hou and Mathijs A. van Dijk*

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Abstract

Recent studies report that the size effect in the cross-section of stock returns has disappeared after the early 1980s. This paper shows that the disappearance of the size effect from realized returns can be attributed to unexpected shocks to the profitability of small and big firms. We find that small firms experience large negative profitability shocks after the early 1980s, while big firms experience large positive shocks. As a result, realized returns of small and big firms over this period differ substantially from expected returns. After adjusting for the price impact of profitability shocks, we find that there still is a robust size effect in the cross-section of expected returns. Our results highlight the importance of in-sample cash flow shocks for understanding cross-sectional return predictability.

Keywords: Size effect; Expected stock returns; Profitability shocks; Asset pricing tests

JEL Classification: G12; G14; M41

* Kewei Hou is at the Fisher College of Business, Ohio State University. Mathijs van Dijk is at the Rotterdam School of Management, Erasmus University. Emails: hou.28@osu.edu and madijk@rsm.nl. We thank Ravi Bansal, Michael Brandt, Alon Brav, Karl Diether, Ken French, Cam Harvey, Ron Kaniel, Andrew Karolyi, Stewart Myers, Lubos Pástor, Jay Ritter, David Robinson, René Stulz, and seminar participants at Case Western University, Chinese University of Hong Kong, Dartmouth College, Duke University, Erasmus University, Florida State University, Hong Kong University of Science and Technology, Nanyang Technological University, National University of Singapore, Ohio State University, Rice University, Seoul National University, Singapore Management University, University of California San Diego, University of Connecticut, University of Florida, University of Georgia, University of Mannheim, University of Toronto, Chicago Quantitative Alliance, Dimensional Fund Advisors, Inquire Europe/U.K., London Quant Group, Robeco Asset Management, and Society of Quantitative Analysts for helpful comments and discussion. We gratefully acknowledge financial support from Inquire Europe. All errors remain our own.

The size effect in the cross-section of stock returns is one of the most extensively studied topics in asset pricing. Since Banz (1981) reported that small firms earn higher returns than big firms, the size effect has been examined and applied in numerous papers in finance and accounting (e.g., Fama and French, 1992). In addition, multi-factor models that include a mimicking factor for the size effect (e.g., the Fama and French (1993) three-factor model) have become increasingly popular among academic researchers and investment practitioners.

However, recent empirical evidence suggests that the size effect has disappeared since the early 1980s. Specifically, Dichev (1998), Chan, Karceski, and Lakonishok (2000), Horowitz, Loughran, and Savin (2000), and Amihud (2002) report that small firms do not outperform big firms during the 1980s and 1990s. Hirshleifer (2001) states that "The U.S. small firm effect was strongly positive every year during 1974 to 1983, and then was negative for six out of the next seven years." Schwert (2003) asserts that "it seems that the small-firm anomaly has disappeared since the initial publication of the papers that discovered it." In this paper, we show that although the size effect has disappeared from realized returns after the early 1980s, there remains a robust size effect in ex ante expected returns.

It is well understood that realized stock returns are a noisy measure of expected returns (Blume and Friend, 1973; Sharpe, 1978; Froot and Frankel, 1989; Elton, 1999). Elton (1999) shows that realized returns can deviate significantly from expected returns over prolonged periods of time. He argues that the belief that "information surprises tend to cancel out over the period of a study" is misplaced and questions the common practice of using realized returns as a proxy for expected returns in asset pricing tests.

The return decomposition of Campbell (1991) provides an intuitive framework for understanding the relation between realized and expected returns. According to Campbell (1991), realized stock returns equal the sum of expected returns, news about future cash flows (cash flow shocks), and news about future expected returns (discount rate shocks). Using this return decomposition framework, recent studies (e.g., Vuolteenaho, 2002; Chen, Da, and Zhao, 2012) show that individual stock returns are primarily driven by cash flow shocks. In this paper, we build on these arguments and hypothesize that differences in cash flow shocks between small and big firms are responsible for the disappearance of the size effect from realized returns after the early 1980s. In other words, the size effect has gone away primarily because the returns of small firms were lower than expected due to negative in-sample cash flow shocks and/or the returns of big firms were higher than expected due to positive cash flow shocks.

Our hypothesis is further motivated by two major economic developments since the early 1980s. First, we have seen a dramatic increase in the number of newly listed firms on major exchanges. Fama and French (2004) report that these new lists (especially those that are small) perform badly, and raise the possibility that a "bad draw" occurs and the poor performance of the new lists was not anticipated by the market ex ante.[1] Second, we have witnessed significant changes in the level of industry competition due to deregulation and trade liberalization (e.g., Revenga, 1992; MacDonald, 1994; Winston, 1998). Empirical evidence suggests that big firms turn out to be better equipped than small firms to cope with the challenges and opportunities in the new competitive environment (e.g., Borenstein, 1992; Sachs and Schatz, 1994; Zingales, 1998). Consistent with these observations, Chan (2003) finds that firms that experience good news are on average much bigger than firms that experience bad news during the 1980s and 1990s.

An alternative explanation for the disappearance of the size effect is that size is not related to expected returns, neither before the early 1980s nor after, and the significant size effect in

[1] Related, Fama and French (1995) argue that "for some unexplained reason" small firms experience a "prolonged earnings depression" after the early 1980s.

realized returns in the 1960s and 1970s is driven by positive cash flow shocks to small firms and/or negative cash flow shocks to big firms (rather than differences in expected returns). Yet another possibility is that there is no systematic difference in cash flow shocks between small firms and big firms throughout the sample period, and the disappearance of the size effect after the early 1980s thus represents a genuine shift in the relation between size and expected returns. Our aim is to investigate which of these competing hypotheses is most consistent with the data.

We study the size effect over the period 1963-2010 as well as two subperiods (1963-1982 and 1983-2010).[2] For 1963-1982, the value-weighted average realized return (in excess of the risk-free rate) is 1.13% per month for the smallest size decile and 0.17% per month for the largest size decile, which implies a size premium of close to 12% per annum (and statistically highly significant). In contrast, for 1983-2010, the average excess return is 0.53% per month for the smallest size decile and 0.55% for the largest size decile, which implies a size premium that is essentially zero.

To investigate whether cash flow shocks can explain the disappearance of the size effect from realized returns, we use the forecasts from a cross-sectional profitability model to proxy for cash flow expectations. The profitability model is based on an extension of the cross-sectional models in Fama and French (2000, 2006) and Hou and Robinson (2006). Recent studies (e.g., Hou, van Dijk, and Zhang, 2012) show that these cross-sectional models produce earnings forecasts that are superior to analysts' forecasts in terms of coverage, forecast bias, and earnings response coefficient, and represent a better proxy for the market's cash flow expectations than analysts' forecasts. We find that our profitability model captures a large fraction (around 60%) of the variation in future profitability across firms using explanatory variables that are strictly ex

[2] We divide the sample period in 1983 based on previous studies and also evidence from Andrew's (1993) structural break test.

ante. As a proxy for cash flow shocks, we compute "profitability shocks" for individual firms by taking the difference between realized profitability and the profitability forecast based on the model. Consistent with the findings in Hou, van Dijk, and Zhang (2012), we find a strong positive relation between profitability shocks and contemporaneous stock returns. For the entire 1963-2010 sample period (as well as for both subperiods), the value-weighted average return difference between the quintile of firms with the highest profitability shocks and the quintile of firms with the lowest profitability shocks is close to 2% per month. This result suggests that our cross-sectional profitability model does a reasonable job capturing market expectations of profitability: firms that are more (less) profitable than expected earn significantly higher (lower) stock returns. It also suggests that profitability shocks can drive a large wedge between realized and expected returns.

We find that the average profitability shock is close to zero for both small firms and big firms before 1983. But after 1983, small firms experience large negative profitability shocks, whereas big firms experience large positive shocks. The latter result suggests that the realized returns of small (big) firms for the post-1983 period are lower (higher) than expected. As a result, the observed size premium during this period understates the "true" size premium in expected returns.

To quantify the effect of profitability shocks on the size premium, we use two different methods to adjust the realized returns of individual firms for the price impact of profitability shocks (details are provided in Section 3). The return adjustments leave the significant realized size premium for 1963-1982 virtually unchanged, consistent with our finding that the average profitability shock is close to zero for both small and big firms during this period. On the other hand, we uncover a highly significant size premium of 0.74% to 0.78% per month in profitability shock-adjusted returns for 1983-2010. This is in contrast to the negligible size premium in realized returns for the post-1983 period, but is consistent with our finding that small firms experience negative profitability shocks and big firms experience positive profitability shocks during this period (which cause the realized size premium to be lower than the expected premium). Firm-level Fama and MacBeth (1973) cross-sectional regressions confirm the negative and significant relation between size and profit shock-adjusted returns after 1983. We also show that our results are robust to controlling for discount rate shocks and the January effect.

The above findings raise the question what economic forces are responsible for the large profitability shocks to small and big firms after the early 1980s. Additional tests suggest that new lists and industry competition play important roles. New lists account for the bulk of the negative profitability shocks to small firms during the second part of our sample period. In addition, a significant part of the profitability shocks to small and big firms is concentrated in industries that experience structural shifts in their competitive environment in the 1980s and 1990s.

In sum, we offer a simple and intuitive explanation for the disappearance of the size effect after the early 1980s. We show that shocks to the profitability of small and big firms have caused the size premium to appear negligible during this period. After adjusting for the impact of these profitability shocks, the returns of small firms exceed those of big firms by close to 10% per annum. Our findings suggest that the size effect in expected returns has not gone away. They also highlight the importance of in-sample profitability shocks for understanding the predictability in the cross-section of stock returns.

The results of this paper are not only relevant for academic researchers, but also for the asset management industry. Our analysis suggests that tilting equity portfolios towards small cap stocks produces systematically higher expected returns. Although it is certainly possible that small firms may yet again experience negative profitability shocks in the future, we show that the size effect in expected returns is alive and well.

The rest of the paper is organized as follows. Section 1 describes the data and the size effect for the entire sample period as well as for the pre-1983 and post-1983 subperiods. Section 2 introduces our firm-level cross-sectional profitability model and estimates the profitability shocks to small and big firms. Section 3 re-examines the size effect after adjusting realized returns for the impact of profitability shocks. Section 4 explores several potential explanations for the profitability shocks to small and big firms for the post-1983 period. Section 5 concludes.

1. Data and sample description

Our sample includes all NYSE, Amex, and Nasdaq listed firms with sharecodes 10 or 11 (i.e., excluding ADRs, closed-end funds, and REITs) that are contained in the intersection of the CRSP monthly returns file and the Compustat fundamentals annual file between July 1963 and December 2010. Following Fama and French (1992), we match CRSP monthly stock returns from July of year *t* to June of year *t*+1 with Compustat accounting information for the fiscal year ending in year *t*–1. We use the following variable definitions. Size is the CRSP market equity at the end of June of year *t*. Earnings is operating income after depreciation from Compustat. Book equity is Compustat stockholder’s equity (or common equity plus preferred stock par value, or assets minus liabilities) plus balance sheet deferred taxes and investment tax credit minus the book value of preferred stock and post retirement assets. BE/ME is book equity divided by CRSP market equity at the end of year *t*–1. Accruals are calculated using the indirect balance sheet method as the change in non-cash current assets minus the change in current liabilities excluding the change in short-term debt and the change in taxes payable minus depreciation and amortization expense. Total assets and dividends are also from Compustat. Finally, the market value of a firm is defined as its total assets plus Compustat market equity at fiscal year-end minus book equity.

At the end of June of each year *t* between 1963 and 2010, we sort firms into size decile portfolios using NYSE breakpoints, and calculate the value-weighted and equal-weighted monthly returns on the decile portfolios from July of year *t* to June of year *t*+1. Table 1 reports the summary statistics (Panel A) and the average value-weighted (Panel B) and equal-weighted (Panel C) returns (in excess of the 1-month T-Bill rate) of each size portfolio as well as the differences in returns between Decile 1 (small firms) and Decile 10 (big firms). The table reports the results for the whole sample period (1963:07-2010:12) and for the two subperiods (1963:07-1983:06 and 1983:07-2010:12). We split the sample period in 1983 based on Andrew's (1993) structural break test, which suggests that there is a break in the size premium in 1983. The choice of this breakpoint is also consistent with previous studies (cited in the Introduction) that suggest that the size effect has disappeared since the early 1980s. We have verified that our results are robust to using 1981 (the year Banz's paper was published) instead of 1983 as the breakpoint.

Over the entire sample period, the average value-weighted return spread between small firms and big firms is 0.40% per month (barely two standard errors from zero). Consistent with previous studies, there is a strong size effect during the first part of our sample period. The average return spread is 0.96% (*t*-stat = 2.82) per month for 1963:07-1983:06, which implies a size premium of close to 12% per annum. In contrast, the average return spread is negligible at −0.02% (*t*-stat =−0.06) per month for 1983:07-2010:12. The results based on equal-weighted returns (reported in Panel C of Table 1) show a similar pattern. Figure 1 plots the annualized size premium over time. Although there are several years before 1983 in which small firms earn lower returns than big firms, the poor performance of small firms during the second part of the sample period – and especially in the 1980s and the 1990s – is striking.

2. Measuring expected profitability and profitability shocks

2.1 Cross-sectional profitability model

To investigate whether differences in cash flow shocks are responsible for the disappearance of the size effect after the early 1980s, we need to model the expected cash flows of small and big firms. Previous studies tend to use either analysts' earnings forecasts or earnings forecasts from firm-specific time-series models to proxy for cash flow expectations. However, there are a number of concerns about applying these forecasts to our analysis. One such concern regarding analysts' forecasts is the lack of coverage for small firms. The IBES analyst data only starts in the late 1970s and many small firms simply have little or no coverage, especially during the earlier years (La Porta, 1996; Hong, Lim, and Stein, 2000). In addition, analysts' forecasts are known to be biased (see, e.g., Francis and Philbrick, 1993; Dugar and Nathan, 1995; McNichols and O'Brien, 1997; Lin and McNichols, 1998), which can have a significant effect on measuring cash flow shocks. The concern about earnings forecasts from time-series models is that they are typically restricted to firms with a long earnings history, which introduces survivorship bias and excludes many small firms from the analysis. Furthermore, estimates from those individual time-series regressions are not very precise.

Motivated by these considerations, we use a cross-sectional profitability model similar to those in Fama and French (2000, 2006) and Hou and Robinson (2006) to measure cash flow expectations. Those authors show that cross-sectional models are able to capture a significant fraction of the variation in future profitability across firms. In addition, a recent paper by Hou, van Dijk, and Zhang (2012) shows that the earnings forecasts generated by such cross-sectional models have substantially larger cross-sectional and time-series coverage, exhibit much lower levels of forecast bias and much higher levels of earnings response coefficient (i.e., stock price reactions to earnings shocks), and represent a better proxy for the market's cash flow expectations than analysts' forecasts.

Specifically, for each year t between 1963 and 2010, we estimate a cross-sectional regression of profitability on variables that have been shown to capture differences in expected profitability across firms:

$$\frac{E_{i,t+1}}{A_{i,t}} = \alpha_{0,t} + \alpha_{1,t}\frac{V_{i,t}}{A_{i,t}} + \alpha_{2,t}DD_{i,t} + \alpha_{3,t}\frac{D_{i,t}}{B_{i,t}} + \alpha_{4,t}\frac{E_{i,t}}{A_{i,t-1}} + \eta_{i,t+1}, \tag{1}$$

where $E_{i,t+1}/A_{i,t}$ is earnings of firm i in year t+1 scaled by its lagged total assets in year t, $V_{i,t}/A_{i,t}$ is the ratio of the market value to the book value of assets, $DD_{i,t}$ is a dummy variable that equals 0 for dividend payers and 1 for non-payers, $D_{i,t}/B_{i,t}$ is the ratio of dividend payments to book equity, and $E_{i,t}/A_{i,t-1}$ is lagged profitability.[3] All explanatory variables are measured as of year t. An important advantage of this cross-sectional regression is that it uses the large cross-section of individual firms to generate statistical power while imposing minimal survivorship requirements.

Table 2 reports the average coefficients from the annual profitability regressions as well as their time series t-statistics over 1963-2010 and for the two subperiods 1963-1982 and 1983-2010.[4] Our results are similar to those reported in Fama and French (2000, 2006) and Hou and Robinson (2006). Over the entire sample period, profitability is positively related to *V/A* and *D/B*, which suggests that firms with higher market-to-book ratios and those that pay out more dividends are more profitable. The coefficient on *DD* is negative, which implies that non-dividend payers are less profitable than dividend payers. The coefficient on lagged profitability is large and positive, suggesting that profitability is highly persistent. All of the coefficients are

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[3] Firms with total assets or book equity close to zero can produce extreme values for the scaled variables. To prevent these extreme observations from dominating the profitability regressions, we exclude firms with total assets less than \$10 million and book equity less than \$5 million.

[4] We obtain nearly identical results when we estimate Equation (1) excluding financial firms and utilities, using pooled data over the past five or ten years, or for each sector separately.

statistically significant at the 1% level. In addition, the average adjusted R^2 shows that a substantial 56% of the variation in profitability across firms is captured by our profitability model.

The subperiod results show that the coefficients on *V/A* and *D/B* are much larger in magnitude and statistically more significant for the first subperiod than for the second subperiod. The opposite is true for the coefficient on *DD*. The findings of Fama and French (2004) suggest that the market-to-book ratio is a noisy predictor of profitability after the early 1980s because of the emergence of a large number of young firms with strong growth opportunities and low near-term profitability. At the same time, the "disappearing dividends" effect documented by Fama and French (2001) suggests that the dividend dummy is a more powerful predictor of performance after the early 1980s. The coefficient on lagged profitability and the adjusted R^2 are slightly higher for the first subperiod than for the second subperiod.

Table 2 also reports the results of two extended profitability models that include a negative earnings dummy, asset growth, and positive and negative accruals as additional predictors. Although the coefficients on most of these variables are statistically significant, they do not add much to the overall explanatory power of the model. Therefore, we focus on the baseline profitability model (Equation (1)) for the rest of the paper. Our main results are slightly stronger when we use the extended models.

2.2 Expected profitability and profitability shocks

Using the regression estimates of Equation (1), we compute, for each firm *i* and each year *t* in our sample, the expected profitability for year *t*+1 by multiplying the independent variables as of year *t* with the regression coefficients from the year *t*–1 profitability regression. This is to ensure that all information required to forecast year *t*+1 profitability is available in year *t*. We then compute the firm's profitability shock (proxy for cash flow shock) for year *t*+1 as the difference between the realized profitability for year *t*+1 and the expected profitability.[5]

In order for our profitability shock estimates to represent true cash flow shocks to a firm, it is essential that our profitability model does a reasonable job capturing market expectations. To investigate this, we study the relation between the profitability shock estimates and contemporaneous stock returns. If the profitability forecasts generated by our model lines up well with market expectations, we should expect to see a strong stock price reaction when realized profitability differs from the model's forecasts.

For each year between 1963 and 2010, we sort firms into quintile portfolios based on their profitability shocks using NYSE breakpoints. Table 3 reports the average value-weighted (Panel A) and equal-weighted (Panel B) profitability shocks and returns (in excess of the 1-month T-Bill rate) of the quintile portfolios. The table shows that our profitability model produces considerable variation in profitability shocks across firms. For the entire sample period, Quintile 1 firms are associated with an average value-weighted profitability shock of −6.03% per annum, while Quintile 5 firms are associated with a positive average shock of 7.99% per annum. More importantly, there is a strong positive relation between profitability shocks and contemporaneous stock returns. For the entire sample period, the average value-weighted excess return increases monotonically from −0.60% per month for Quintile 1 to 1.24% per month for Quintile 5, and the average return spread between the extreme quintiles (5−1) is 1.83% per month and statistically highly significant (*t*-stat = 14.29).[6] The results for the two subperiods are very similar to those for the entire sample period in terms of the variation in profitability shocks and the relation between

[5] In unreported results, we estimate firm-by-firm first-order auto-regressions using the estimated profitability shocks. The cross-sectional average of the autoregressive coefficient is −0.02 (*t*-stat = −0.25). In addition, the R^2's of these regressions are tiny. We also estimate pooled regressions with firm fixed effects and obtain similar results. These findings suggest that shocks to a firm's profitability are not predictable based on past shocks.

[6] We note that this return spread does not represent a profitable trading strategy since profitability shocks are not known at the time of portfolio formation.

profitability shocks and returns. The equal-weighted results reported in Panel B of Table 3 show even bigger spreads in profitability shocks and returns across quintiles. Specifically, the average 5-1 return spread is close to 3% per month for the entire sample period as well as for the two subperiods.

The results in Table 3 suggest that our profitability model provides a good approximation of the market's expectations of future profitability, since firms that turn out to be more (less) profitable than the model's forecasts earn significantly higher (lower) returns. They are consistent with the finding of Hou, van Dijk, and Zhang (2012) that the earnings forecasts generated by the cross-sectional model are associated with greater earnings response coefficient than analysts' forecasts and thus represent a better proxy for market expectations than analysts' forecasts. The results also suggest that profitability shocks have a large impact on the cross-section of (realized) returns. In the next section, we proceed to examine the profitability shocks to small and big firms.

2.3 Profitability shocks to small and big firms

Panel A of Table 4 reports the average value-weighted expected profitability and profitability shocks of the size decile portfolios. The table shows that expected profitability declines for all size deciles over the sample period, which is consistent with the finding of Fama and French (2004) that U.S. publicly traded companies have become less profitable over time. In terms of profitability shocks, there is no discernible pattern across the size deciles for the 1963-1982 subperiod as the average shock is close to zero both economically and statistically for all size deciles. In particular, small firms (Decile 1) are associated with an average value-weighted profitability shock of −0.22% (t-stat = −0.66) per annum and big firms (Decile 10) are associated with an average shock of 0.01% (t-stat = 0.03) per annum. The difference between small firms and big firms is also indistinguishable from zero (t-stat = 0.50).

In contrast, both small firms and big firms experience large profitability shocks (but of opposite signs) during the 1983-2010 subperiod. Small firms are associated with an average value-weighted profitability shock of −1.81% (*t*-stat = −6.06) per annum, which amounts to more than 50% of their average expected profitability (3.24%). On the other hand, big firms are associated with a positive average positive profitability shock of 2.41% (*t*-stat = 8.29) per annum. The difference between small and big firms, 4.22% per annum, is economically large and statistically highly significant (*t*-stat = 10.12). The equal-weighted results reported in Panel B of Table 4 show a similar pattern. None of the size deciles exhibits significant profitability shocks before 1983, but small firms experience large negative shocks and big firms experience large positive shocks after 1983.[7]

The patterns of profitability shocks for the 1983-2010 subperiod suggest that the difference in expected returns between small firms and big firms for that period should be more positive than the realized return spread implies. This is because the negative profitability shocks to small firms cause their realized returns to be lower than expected whereas the positive profitability shocks to big firms cause their returns to be higher than expected. On the other hand, the expected size premium for the 1963-1982 subperiod should be fairly close to the realized return spread because the profitability shocks are essentially zero for both small firms and big firms over that period. In the next section, we re-examine the size effect (especially for the 1983-2010 subperiod) after adjusting the realized returns of small and big firms for the effect of their profitability shocks.

[7] One might question whether these profitability shocks to small firms and big firms are truly unexpected by market participants. In untabulated tests, we find that small firms are consistently associated with less favorable market reactions to their quarterly earnings announcements as well as more negative revisions in analysts' earnings forecasts than big firms during the post-1983 sample period. For example, the revisions in the consensus analyst earnings forecast (scaled by prior month's stock price) average −76 basis points over the twelve-month period after portfolio formation for small firms and only −6 basis points for big firms, with the difference being highly significant both statistically and economically. We view these results as consistent with both investors and analysts failing to anticipate the divergence in profitability between small firms and big firms during the post-1983 period.

Panel C of Table 4 reports the dispersion in expected profitability and profitability shocks within each size decile. The within-group standard deviation of profitability shocks decreases as size increases, and the difference between small firms and big firms is large and statistically significant (for the entire sample period as well as for the two subperiods). This finding raises the possibility that the size effect in expected returns (if there is indeed an effect) is related to the differences between small firms and big firms in the level of uncertainty about their future profitability. We leave an extensive investigation of this hypothesis for future work.

3. Adjusting the size effect for profitability shocks

3.1 Portfolio sorts

We use two different methods to adjust realized returns for the effect of profitability shocks. In the first method, we measure the price impact per unit of profitability shock by dividing the return spread between the highest and the lowest profitability shock-sorted quintile portfolios each month by the difference in profitability shocks between the two extreme quintiles. We then subtract the product between each individual firm's profitability shock and this price impact measure each month from the firm's realized return that month to obtain an estimate of the return adjusted for the effect of profitability shocks. The second adjustment method is similar to the first one in that it also relies on the contemporaneous relation between returns and profitability shocks to correct individual stock returns. But instead of using returns on the profitability shock-sorted quintile portfolios, it uses the monthly coefficient of regressing individual stock returns on profitability shocks to compute the price impact measure. We obtain similar results when we compute both price impact measures at the sector level.

Table 5 reports the average value-weighted (Panel A) and equal-weighted (Panel B) realized and adjusted returns of the size decile portfolios, as well as the small−big (1−10) return spreads. To be included in the analysis, a firm has to have sufficient information to calculate its profitability shock for a given year. This data requirement increases the value-weighted realized size premium from 0.40% (*t*-stat = 1.91) per month (see Table 1) to 0.67% (*t*-stat = 3.23) per month for the entire sample period, from 0.96% (*t*-stat = 2.82) to 1.19 (*t*-stat = 3.40) for the first subperiod, and from −0.02% (*t*-stat = −0.06) to 0.28% (*t*-stat = 1.14) for the second subperiod. Similar increases occur for the equal-weighted size premium.

For the entire sample period 1963:07-2010:12, adjusting realized returns for the impact of profitability shocks raises the value-weighted size premium from 0.67% (*t*-stat = 3.23) per month to 0.90% (*t*-stat = 4.47) or 0.92% (*t*-stat = 4.61) per month, depending on the adjustment method. This increase stems entirely from the return adjustments for the second subperiod. For the first subperiod 1963:07-1983:06, we see almost no change in the size premium after the return adjustments (the size premium decreases slightly from 1.19% (*t*-stat = 3.40) per month in realized returns to 1.12% (*t*-stat = 3.22) per month using either adjustment method), consistent with the finding in Table 4 that the average profitability shock is close to zero for both small and big firms during this period.

But for the second subperiod 1983:07-2010:12, the value-weighted size premium increases substantially from 0.28% (*t*-stat = 1.14) per month in realized returns to 0.74% (*t*-stat = 3.09) per month using the first adjustment method (Adjustment 1), or to 0.78% (*t*-stat = 3.30) per month using the second adjustment method (Adjustment 2). In addition, this increase in the size premium derives from both the long side (small firms) and the short side (big firms). For example, for Adjustment 1, the average return of small firms (Decile 1) increases from 0.79% per month to 0.99% per month, whereas the average return of big firms (Decile 10) decreases from 0.51% per month to 0.25% per month. These results are consistent with the finding in Table 4 that small firms experience negative profitability shocks while big firms experience positive shocks after 1983, thus causing the realized size premium to understate the true size premium in expected returns.

The equal-weighted results reported in Panel B of Table 5 are very similar to the value-weighted findings. The return adjustments leave the equal-weighted size premium virtually unchanged for the first subperiod but increase the premium substantially by more than 0.40% per month for the second subperiod.

3.2 Fama-MacBeth cross-sectional regressions

Table 6 reports the results of monthly Fama and MacBeth (1973) cross-sectional regressions of individual stocks' realized and profitability shock-adjusted returns on size. We also include BE/ME in the regressions to control for the value effect in expected returns. These regressions complement and provide further robustness checks to our portfolio-based results in Table 5 since they use all firms without imposing decile breakpoints and provide an alternative weighting scheme for portfolios.[8] In addition, using adjusted returns as the dependent variable in the cross-sectional regressions avoids the errors-in-variable problems created by errors in estimating firm-specific profitability shocks, because these errors are impounded into the dependent variable directly.

The first column of Table 6 shows that size is negatively and significantly related to average realized returns for the whole sample period and for the first subperiod, but not for the second subperiod. The average coefficient on size is −0.12 (*t*-stat = −2.76) for 1963:07-2010:12, −0.19 (*t*-stat = −2.63) for 1963:07-1983:06, and −0.07 (*t*-stat = −1.29) for 1983:07-2010:12.

[8] The regression coefficient on size can be interpreted as the return on a zero-cost minimum variance portfolio with weighted size that sums to one and weighted BE/ME that sums to zero. The weights are tilted towards small and volatile firms.

The next two columns of Table 6 report the regression results for adjusted returns. They show that adjusting realized returns for the effect of profitability shocks strengthens both the economic and statistical significance of the size effect for the whole sample period and the second subperiod, but not for the first subperiod. For the entire sample period 1963:07-2010:12, the average coefficient on size increases from −0.12 (*t*-stat = −2.76) for realized returns to −0.15 (*t*-stat = −3.68) for Adjustment 1, and to −0.16 (*t*-stat = −3.81) for Adjustment 2. More impressively, for the second subperiod 1983:07-2010:12, the return adjustments more than double the average coefficient on size from −0.07 (*t*-stat = −1.29) for realized returns to −0.16 (*t*-stat = −3.03) for Adjustment 1 and −0.16 (*t*-stat = −3.27) for Adjustment 2. On the other hand, for the first subperiod 1963:07-1983:06, the average coefficient on size actually weakens slightly to −0.15 (*t*-stat = −2.16) for Adjustment 1 and −0.15 (*t*-stat = −2.13) for Adjustment 2, leaving it now virtually indistinguishable from the corresponding coefficient for the second subperiod.

The key takeaway from Tables 5 and 6 is that negative profitability shocks to small firms combined with positive profitability shocks to big firms are responsible for the disappearance of the size effect from realized returns after the early 1980s. After adjusting for the price impact of those profitability shocks, we uncover an economically large and statistically highly significant size premium in expected returns for the post-1983 sample period.

3.3 Controlling for discount rate shocks

So far we have focused on cash flow (profitability) shocks and ignored the impact of discount rate shocks on the size effect. We have done so because the prevailing view in the literature is that cash flow shocks are largely firm-specific while discount rate shocks are tied to systematic, macroeconomic fluctuations and thus are common across firms. Consequently, discount rate shocks should have minimal impact on cross-sectional return patterns (such as the size effect).

This view is further supported by recent empirical findings that firm-level returns are primarily driven by cash flow shocks and the effect of discount rate shocks tends to show up only in aggregate returns (see Vuolteenaho, 2002 and Chen, Da, and Zhao, 2012 for firm-level evidence and Campbell, 1991 and Campbell and Ammer, 1993 for aggregate-level evidence). Nevertheless, in this section we control for the discount rate effect by regressing the profitability shock-adjusted size premium on proxies for discount rate shocks.

Following the approach in Breeden, Gibbons, and Litzenberger (1989), Lamont (2001), and Ang, Hodrick, Xing, and Zhang (2006), we first create mimicking portfolios for discount rate shocks using the fitted values from time-series regressions of innovations in a number of discount rate proxies on the excess returns of the 30 industry portfolios (base assets) downloaded from Ken French's website.[9] Our discount rate proxies consist of several variables that have been shown by previous studies to track expected return variation in response to business cycles and business conditions: the dividend yield on the CRSP value-weighted market index, the yield spread between the 10-year T-Bond and the 3-month T-Bill (term spread), the yield spread between BAA and AAA corporate bonds (default spread), and the 3-month T-Bill rate.[10] We measure innovations in these discount rate proxies using both the first differences and the forecast errors from an AR(1) model.

In the second step, we regress the value-weighted size premium computed using profitability shock-adjusted returns on returns of the discount rate mimicking portfolios.[11] We can evaluate the marginal effect of discount rate shocks on the size effect by comparing the regression intercept to the average value of the adjusted size premium.

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[9] To conserve space, the results of these regressions are not reported, but they are available upon request.

[10] See, e.g., Shiller (1984), Campbell and Shiller (1988), Fama and French (1988, 1989), and Kothari and Shanken (1997) for evidence on the dividend yield predicting aggregate stock returns; Keim and Stambaugh (1986), Fama and French (1989), and Pontiff and Schall (1998) for evidence on the term spread and default spread; Fama and Schwert (1977), Breen, Glosten, and Jagannathan (1989), and Ang and Bekaert (2007) for evidence on the short rate.

[11] The results using the equal-weighted adjusted size premium are very similar. For brevity, they are not reported.

Table 7 reports the second-stage regression results for the whole sample period and the two subperiods, for the two methods of adjusting returns for the effect of profitability shocks, and for the two ways of measuring innovations in the discount rate proxies. The regressions produce significant coefficients on some of the discount rate mimicking portfolios (the default spread in particular) and the regression R^2 generally lies between 10% and 20% depending on the specification. Thus, the size premium and discount rates do appear to move together. However, controlling for this relation has little effect on the magnitude of the adjusted size premium (if anything, it raises it). For example, Table 5 shows that for the second subperiod 1983:07-2010:12, adjusting realized returns for the effect of profitability shocks produces an adjusted size premium of 0.74% per month using the first adjustment method. Table 7 shows that controlling for discount rate shocks raises the size premium further to 0.84% per month regardless of whether we use first differences or the AR(1) errors to measure innovations in the discount rate proxies. Hence, our main finding that there exists a significant size effect for the post-1983 period after adjusting realized returns for the effect of profitability shocks is robust to additionally controlling for discount rate shocks.

3.4 The January effect

Brown, Kleidon, and Marsh (1983), Keim (1983), and Reinganum (1983) link the size effect to the January seasonal in stock returns (Rozeff and Kinney, 1976). Both the size effect and the January effect are to a large extent driven by the extraordinary performance of small firms in January. It is therefore interesting to examine whether there still is a January seasonal in the size effect after the early 1980s even though the observed size effect averaged across all months is insignificant during this period. We also want to investigate how the return adjustments for profitability shocks affect the size premium in January versus other months.

Table 8 reports the average value-weighted (Panel A) and equal-weighted (Panel B) realized and profitability shock-adjusted returns of small firms (Deciles 1) and big firms (Decile 10) as well as the small−big (1−10) return spreads for January and for February-December separately. The table shows a strong January effect in realized returns for both the pre- and post-1983 subperiods (although the magnitude of the effect for the post-1983 subperiod is only about half of that for the pre-1983 subperiod). For example, small firms outperform big firms in January by 8.27% (*t*-stat = 5.80) in value-weighted realized returns for 1963:07-1983:06 and by 4.06% (*t*-stat = 3.92) for 1983:07-2010:12. In contrast, small firms only outperform big firms by 0.53% (*t*-stat = 1.63) per month in February-December for 1963:07-1983:06 and actually underperform big firms by 0.05% (*t*-stat = 0.22) per month for 1983:07-2010:12.

Table 8 also shows that for the pre-1983 subperiod, adjusting realized returns for profitability shocks has little effect on the size premium in either January or February-December, which is consistent with the overall result in Table 5. For example, the value-weighted size premium only decreases slightly from 8.27% (*t*-stat = 5.80) to 8.04% (*t*-stat = 5.67) in January and from 0.53% (*t*-stat = 1.63) to 0.47% (*t*-stat = 1.46) per month in February-December for Adjustment 1. On the other hand, for the post-1983 subperiod, the return adjustments appear to have a disproportionally larger effect on the size premium in February-December than in January. For example, Adjustment 2 raises the value-weighted size premium in February-December from an insignificant −0.05% (*t*-stat = −0.22) per month to a significant 0.48% (*t*-stat = 2.06) per month while leaving the size premium in January unchanged at 4.06% (*t*-stat = 4.31).

4. Explaining the profitability shocks to small and big firms

Our results thus far show that small firms experience negative profitability shocks while big firms experience positive shocks after the early 1980s. After adjusting realized returns for the effect of those profitability shocks, we find an economically large and statistically highly significant size effect for the post-1983 period.

These results raise an interesting question: What economic forces are behind the profitability shocks to small and big firms after the early 1980s? A possible explanation for the negative profitability shocks to small firms is the "new lists" effect documented by Fama and French (2004). They report that the number of newly listed firms on major exchanges increases dramatically in the 1980s and 1990s. However, both the profitability and the survival rate of these newly listed firms decline sharply over this period, especially for the small new lists. Fama and French argue that a decline in the cost of equity allows weaker firms and firms with more distant expected payoffs to raise equity after the early 1980s, and raise the possibility that "(…) ex post, a bad draw occurs; the failure rates of the new weaker class of new lists turn out to be higher than was rationally anticipated ex ante, and the overall new list returns are low."

For the post-1983 subperiod, new lists make up a significant fraction of the firms in the smallest size decile. The negative profitability shocks to small firms during this period might thus to a large extent stem from the poor performance of those new lists. We investigate this hypothesis in Table 9, which reports, for new lists and seasoned firms separately, the average value-weighted (Panel A) and equal-weighted (Panel B) expected profitability and profitability shocks of small firms (Decile 1) and big firms (Decile 10) for the post-1983 period. Following Fama and French (2004), we define new lists as firms that have been listed for less than five years, based on the first appearance of a firm's PERMCO on CRSP. Seasoned firms are those that have been listed for more than five years. We use the same size decile breakpoints as in Table 4 for both new lists and seasoned firms so we can directly compare the expected profitability and profitability shocks of small and big firms across the two groups.

Table 9 shows that the average expected profitability is lower for small new lists than for small seasoned firms, but is virtually identical for big new lists and big seasoned firms. More importantly, small new lists experience much more negative profitability shocks than small seasoned firms. The average value-weighted profitability shock to small new lists over 1983-2010 is −4.19% (*t*-stat = −8.76) per annum, compared with −1.15% (*t*-stat = −4.15) for small seasoned firms and −1.81% (*t*-stat = −6.06) for all small firms (new lists and seasoned, see Table 4). Hence, a significant portion of the profitability shocks to small firms can be attributed to small new lists. Table 9 also shows that big seasoned firms experience more positive profitability shocks than big new lists. The average profitability shock to big seasoned firms is 2.51% (*t*-stat = 7.44) per annum, compared with 0.41% (*t*-stat = 0.25) for big new lists and 2.41% (*t*-stat = 8.29) for all big firms (see Table 4). This result suggests that the profitability shocks to big firms are almost entirely driven by big seasoned firms.

A second potential explanation for the profitability shocks to small and big firms concerns the changes in industry market structure brought upon by trade liberalization and industry deregulation. The U.S. economy becomes increasingly open during the 1980s and 1990s, as evidenced by the strong and steady increase in import penetration ratios (e.g., Revenga, 1992; MacDonald, 1994).[12] In addition, starting in the late 1970s, we have seen a wave of deregulation in many U.S. industries (e.g., Mitchell and Mulherin, 1996). Adjustments of industries to their new competitive environment can take decades and the effect on the performance of different companies is hard to anticipate ex ante (Winston, 1998). Empirical evidence suggests that big firms turn out be more effective than small firms in dealing with the challenges and opportunities stemming from trade liberalization and industry deregulation. For example, Sachs and Schatz

[12] The ratifications of the 1979 Tokyo round of the GATT, the 1988 Canada-U.S. Free Trade Agreement, and NAFTA in 1993 are the major legislative landmarks of trade liberalization.

(1994) document that large multinationals play an important role in the dramatic increase in international trade. Borenstein (1992), Mitchell and Mulherin (1996), and Pryor (2001) show that deregulation and foreign competition force industries to consolidate in the 1980s and 1990s. In addition, Zingales (1998) shows that big firms are more likely to survive after deregulation, consistent with the theoretical predictions of Telser (1966) and Bolton and Scharfstein (1990).

In Table 10, we study the role of industry market structure and competition by examining to what extent the profitability shocks to small and big firms after the early 1980s are concentrated in industries that experience significant changes in their competitive environment due to trade liberalization or deregulation. The table reports, separately for industries that go through structural shifts and those that do not, the average value-weighted (Panel A) and equal-weighted (Panel B) expected profitability and profitability shock of small firms and big firms for the post-1983 subperiod. We obtain the list of industries that experience deregulation or increased foreign competition from Mitchell and Mulherin (1996).[13] Similar to Table 9, we use the same size decile breakpoints for both groups of industries to facilitate direct comparisons of the expected profitability and profitability shocks across the two groups.

Table 10 shows that the average expected profitability of small (big) firms from industries with structural shifts is lower (higher) than that of firms of similar size from the other industries. In addition, small firms and big firms from the first group of industries experience more extreme profitability shocks than firms of similar size from the other industries. For example, the average value-weighted profitability shock to small firms from industries with structural shifts is −2.67% (t-stat = −6.54) per annum, compared with −0.79% (t-stat = −3.65) for small firms from the other

[13] These industries are Air Transportation, Broadcasting and Communications, Entertainment, Natural Gas, Trucking and Transport Leasing, Footwear, Machine Tool, Apparel, Construction Machinery, Office Equipment, Computer Data Processing, Auto Parts, Household Appliances, Electronics, Tire and Rubber, Machinery, Steel, Electrical Equipment, Textiles, Chemicals and Allied Products, and Precision Instruments. See Mitchell and Mulherin (1996) for further details.

industries and −1.81% (*t*-stat = −6.06) for small firms across all industries. On the other hand, the average profitability shock to big firms from industries with structural shifts is 3.26% (*t*-stat = 7.82) per annum, compared with 1.29% (*t*-stat = 7.26) for big firms from the other industries and 2.41% (*t*-stat = 8.29) for big firms across all industries. Hence, industries that experience significant changes in their market structure contribute disproportionally to the profitability shocks to small firms and big firms.

Taken together, the evidence in Tables 9 and 10 points to new lists and changes in industry market structure as important sources of the profitability shocks to small and big firms after the early 1980s. It is also worth noting that the two effects should be viewed as complementary as they are clearly related to each other: several of the industries that experience significant changes in their market structure (e.g., Computer Data Processing, Electronics and Electrical Equipment, Precision Instruments, Chemicals and Allied Products, and Broadcasting and Communications) are also among the top industries with the highest number of IPOs (see Helwege and Liang, 2004). We consider a full investigation of the interaction between these two effects to be an interesting area for future research.

5. Conclusions

The size effect in the cross-section of stock returns is one of the most extensively studied subjects in asset pricing. It was widely accepted that small firms earn higher returns than big firms – until recent studies show that the size effect has disappeared after the early 1980s. Our paper examines the hypothesis that differences in cash flow shocks between small firms and big firms are responsible for the disappearance of the size effect from realized returns.

To investigate this hypothesis, we estimate the profitability shocks to individual firms using a cross-sectional regression model. We find that small firms experience large negative shocks to their profitability while big firms experience positive shocks after the early 1980s. After adjusting realized returns for the effect of those profitability shocks, we are able to uncover a significant size premium of close to 10% per annum for 1983-2010. We identify new lists and changes in industry market structure as important sources of the profitability shocks to small and big firms for the post-1983 period. Our results are robust to alternative profitability models, different return adjustments, different test methods, and controlling for discount rate shocks.

There are a number of interesting areas for future research. First, we hope that our finding that the size effect in the cross-section of expected returns has not gone away will lead to a revival of academic research on the underlying causes of the size effect.

Second, we show that the differences between ex post realized returns and ex ante expected returns as a result of in-sample profitability shocks lead to different inferences on the size effect. In a follow-up paper, we plan to examine the implications of profitability shocks for a broad range of anomalies in the asset pricing literature.

Third, in addition to considering near-term profitability shocks, we could also measure changes in expectations about more distant profitability and study their effect on the cross-section of returns. This could help us improve our estimates of expected returns. We leave a thorough investigation of this and other issues for future research.

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Table 1: Summary statistics and average returns of size deciles

This table reports the average number of firms, the average value-weighted (VW) and equal-weighted (EW) size in billions of dollars (Panel A), the average value-weighted (Panel B) and equal-weighted (Panel C) realized returns (in excess of the 1-month T-Bill rate and expressed in percent per month) and their corresponding *t*-statistics of size decile portfolios formed at the end of June of each year using NYSE breakpoints, as well as the average return differences between Deciles 1 and 10. The table reports the results for the full 1963:07-2010:12 sample period and for the 1963:07-1983:06 and 1983:07-2010:12 subperiods.

Panel A: Summary statistics

	Small	2	3	4	5	6	7	8	9	Big
1963:07-2010:12										
# of firms	2304	560	367	290	243	207	184	174	159	153
VW size	0.05	0.12	0.22	0.33	0.50	0.75	1.15	1.94	3.98	42.87
EW size	0.03	0.12	0.21	0.33	0.49	0.74	1.13	1.88	3.77	18.42
1963:07-1983:06										
# of firms	1629	346	254	215	195	167	154	148	139	137
VW size	0.01	0.03	0.05	0.08	0.11	0.17	0.25	0.42	0.73	10.40
EW size	0.01	0.03	0.05	0.08	0.11	0.16	0.25	0.41	0.71	3.08
1983:07-2010:12										
# of firms	2786	713	448	344	278	236	205	193	174	163
VW size	0.07	0.19	0.33	0.52	0.78	1.17	1.79	3.02	6.30	66.07
EW size	0.05	0.18	0.33	0.51	0.77	1.15	1.76	2.93	5.96	29.38

Panel B: Average value-weighted returns

	Small	2	3	4	5	6	7	8	9	Big	Small-Big
1963:07-2010:12											
VW realized return	0.78	0.63	0.70	0.68	0.71	0.61	0.66	0.59	0.53	0.39	0.40
t-statistic	*2.81*	*2.28*	*2.66*	*2.66*	*2.84*	*2.57*	*2.89*	*2.66*	*2.56*	*2.08*	*1.91*
1963:07-1983:06											
VW realized return	1.13	0.81	0.81	0.84	0.76	0.57	0.54	0.51	0.32	0.17	0.96
t-statistic	*2.45*	*1.90*	*1.96*	*2.11*	*2.05*	*1.57*	*1.54*	*1.56*	*1.06*	*0.62*	*2.82*
1983:07-2010:12											
VW realized return	0.53	0.49	0.63	0.57	0.67	0.64	0.75	0.65	0.68	0.55	-0.02
t-statistic	*1.55*	*1.37*	*1.82*	*1.70*	*2.00*	*2.04*	*2.49*	*2.16*	*2.43*	*2.16*	*-0.06*

Table 1, continued

Panel C: Average equal-weighted returns											
	Small	2	3	4	5	6	7	8	9	Big	Small-Big
1963:07-2010:12											
EW realized return	0.98	0.64	0.71	0.68	0.71	0.61	0.66	0.58	0.54	0.40	0.58
t-statistic	*3.47*	*2.33*	*2.66*	*2.66*	*2.82*	*2.56*	*2.87*	*2.63*	*2.59*	*2.07*	*2.63*
1963:07-1983:06											
EW realized return	1.33	0.82	0.82	0.84	0.76	0.57	0.54	0.50	0.34	0.19	1.15
t-statistic	*2.82*	*1.93*	*1.98*	*2.11*	*2.04*	*1.58*	*1.52*	*1.52*	*1.10*	*0.65*	*3.24*
1983:07-2010:12											
EW realized return	0.72	0.51	0.62	0.58	0.67	0.63	0.74	0.64	0.69	0.56	0.16
t-statistic	*2.09*	*1.41*	*1.80*	*1.70*	*1.98*	*2.02*	*2.48*	*2.15*	*2.43*	*2.13*	*0.59*

Table 2: Cross-sectional profitability regressions

This table reports the average coefficients and their time series *t*-statistics from annual Fama and MacBeth (1973) cross-sectional regressions of profitability (earnings scaled by lagged total assets, E_{t+1}/A_t) on variables that are hypothesized to capture differences in expected profitability across firms. V_t/A_t is the market-to-book ratio of a firm's assets. DD_t is a dummy variable that equals 0 for dividend payers and 1 for non-dividend payers. D_t/B_t is the ratio of dividends to book equity. $Neg\ E_t$ is a dummy variable that equals 1 for firms with negative earnings and 0 otherwise. dA_t/A_{t-1} is the growth rate of total assets. $-AC_t/A_{t-1}$ and $+AC_t/A_{t-1}$ are accruals for firms with negative and positive accruals, respectively, scaled by lagged total assets. We estimate the regressions for each year between 1963 and 2010. The table reports the results for the full 1963-2010 sample period as well as for the 1963-1982 and 1983-2010 subperiods.

	Intercept	V_t/A_t	DD_t	D_t/B_t	E_t/A_{t-1}	$Neg\ E_t$	dA_t/A_{t-1}	$-AC_t/A_{t-1}$	$+AC_t/A_{t-1}$	Adj. R^2
1963-2010										
Coefficient	0.0206	0.0102	-0.0155	0.0990	0.6090					0.56
t-statistic	*8.87*	*6.73*	*-7.53*	*5.14*	*32.08*					
Coefficient	0.0242	0.0108	-0.0077	0.0473	0.6263	-0.0309	-0.0289			0.59
t-statistic	*9.73*	*6.58*	*-5.58*	*2.81*	*24.91*	*-3.46*	*-4.52*			
Coefficient	0.0290	0.0103	-0.0117	0.0638	0.6312	-0.0337	-0.0194	-0.0504	-0.0893	0.60
t-statistic	*8.91*	*5.70*	*-7.48*	*3.73*	*28.26*	*-3.88*	*-3.17*	*-3.15*	*-4.70*	
1963-1982										
Coefficient	0.0133	0.0152	-0.0026	0.1549	0.6761					0.64
t-statistic	*5.72*	*8.39*	*-1.62*	*3.99*	*25.61*					
Coefficient	0.0156	0.0154	-0.0035	0.0331	0.7728	0.0196	-0.0710			0.67
t-statistic	*7.01*	*6.68*	*-2.05*	*0.89*	*29.04*	*2.70*	*-16.01*			
Coefficient	0.0178	0.0162	-0.0035	0.0604	0.7565	0.0163	-0.0592	-0.0099	-0.0617	0.65
t-statistic	*6.97*	*6.24*	*-1.80*	*1.66*	*29.52*	*2.27*	*-15.14*	*-0.73*	*-4.53*	
1983-2010										
Coefficient	0.0259	0.0064	-0.0251	0.0575	0.5593					0.50
t-statistic	*7.80*	*3.22*	*-13.59*	*4.44*	*24.79*					
Coefficient	0.0305	0.0074	-0.0108	0.0578	0.5178	-0.0684	0.0022			0.53
t-statistic	*8.58*	*3.53*	*-5.86*	*5.54*	*23.17*	*-7.17*	*0.41*			
Coefficient	0.0373	0.0058	-0.0179	0.0663	0.5384	-0.0707	0.0101	-0.0803	-0.1097	0.55
t-statistic	*7.80*	*2.73*	*-12.07*	*4.94*	*26.84*	*-7.84*	*1.91*	*-3.26*	*-3.52*	

Table 3: Average returns of portfolios sorted on profitability shocks

This table reports the average value-weighted (Panel A) and equal-weighted (Panel B) profitability shocks, realized returns (in excess of the 1-month T-Bill rate), and their corresponding *t*-statistics of quintile portfolios sorted on profitability shocks, as well as the differences between Quintile 5 and Quintile 1. Profitability shock is the difference between realized profitability and the profitability forecast based on the cross-sectional profitability model (Equation (1)). The table reports the results for the full 1963:07-2010:12 sample period and for the 1963:07-1983:06 and 1983:07-2010:12 subperiods.

Panel A: Average value-weighted profitability shocks and returns

	Low	2	3	4	High	High-Low
1963:07-2010:12						
VW profitability shock	-6.03	-1.52	0.34	2.39	7.99	14.02
t-statistic	*-14.67*	*-10.51*	*2.17*	*11.60*	*17.89*	*20.49*
VW realized return	-0.60	0.19	0.41	0.71	1.24	1.83
t-statistic	*-2.59*	*0.90*	*2.16*	*3.66*	*5.69*	*14.29*
1963:07-1983:06						
VW profitability shock	-5.65	-1.82	-0.29	1.43	6.20	11.86
t-statistic	*-11.26*	*-6.67*	*-1.20*	*5.04*	*13.86*	*24.17*
VW realized return	-0.66	-0.13	0.27	0.69	1.31	1.96
t-statistic	*-1.95*	*-0.43*	*0.95*	*2.32*	*3.90*	*11.25*
1983:07-2010:12						
VW profitability shock	-6.29	-1.31	0.78	3.06	9.25	15.55
t-statistic	*-10.36*	*-8.98*	*5.07*	*14.65*	*15.79*	*15.19*
VW realized return	-0.55	0.42	0.51	0.73	1.19	1.74
t-statistic	*-1.76*	*1.42*	*2.02*	*2.83*	*4.15*	*9.55*

Panel B: Average equal-weighted profitability shocks and returns

	Low	2	3	4	High	High-Low
1963:07-2010:12						
EW profitability shock	-8.69	-1.58	0.34	2.43	8.87	17.56
t-statistic	*-22.62*	*-10.89*	*2.23*	*12.27*	*19.87*	*23.90*
EW realized return	-0.56	0.29	0.67	1.22	2.40	2.96
t-statistic	*-2.07*	*1.34*	*3.04*	*5.21*	*8.94*	*30.92*
1963:07-1983:06						
EW profitability shock	-6.68	-1.87	-0.27	1.50	6.57	13.25
t-statistic	*-14.03*	*-6.83*	*-1.10*	*5.49*	*17.19*	*24.49*
EW realized return	-0.64	0.23	0.67	1.32	2.46	3.09
t-statistic	*-1.53*	*0.65*	*1.84*	*3.37*	*5.60*	*22.81*
1983:07-2010:12						
EW profitability shock	-10.11	-1.38	0.77	3.08	10.49	20.60
t-statistic	*-27.14*	*-9.32*	*5.30*	*15.55*	*20.10*	*26.76*
EW realized return	-0.50	0.33	0.67	1.15	2.36	2.86
t-statistic	*-1.41*	*1.24*	*2.46*	*3.99*	*7.00*	*21.55*

Table 4: Average expected profitability and profitability shocks of size deciles

This table reports the average value-weighted (Panel A) and equal-weighted (Panel B) expected profitability and profitability shock and their corresponding *t*-statistics of size decile portfolios. Expected profitability is the profitability forecast based on the cross-sectional profitability model. Profitability shock is the difference between realized profitability and expected profitability. The last column reports the *t*-statistics for the hypotheses that the expected profitability and profitability shock of Decile 1 are equal to those of Decile 10. Panel C reports the average cross-sectional standard deviation of expected profitability and profitability shocks within each size decile. The table reports results for the full 1963-2010 sample period as well as for the 1963-1982 and 1983-2010 subperiods.

Panel A: Average value-weighted expected profitability and profitability shocks

	Small	2	3	4	5	6	7	8	9	Big	*t*(Small=Big)
1963-2010											
VW expected profitability	6.07	8.42	9.47	10.21	10.93	11.23	11.75	11.71	11.57	14.24	10.11
t-statistic	*9.87*	*14.03*	*17.18*	*20.24*	*21.58*	*22.50*	*25.26*	*28.36*	*27.62*	*27.14*	
VW profitability shock	-1.15	-0.30	0.37	0.62	1.02	1.13	1.06	1.10	0.87	1.42	6.95
t-statistic	*-4.63*	*-1.34*	*2.17*	*3.19*	*4.36*	*5.06*	*4.78*	*4.36*	*3.32*	*5.18*	
1963-1982											
VW expected profitability	10.24	12.31	12.98	13.26	13.94	14.17	14.65	14.25	14.06	17.88	11.39
t-statistic	*19.45*	*20.58*	*28.53*	*27.98*	*29.85*	*30.13*	*35.27*	*41.05*	*42.51*	*43.01*	
VW profitability shock	-0.22	0.09	0.22	0.07	0.15	0.19	0.02	-0.16	-0.35	0.01	0.50
t-statistic	*-0.66*	*0.22*	*0.66*	*0.20*	*0.43*	*0.65*	*0.08*	*-0.57*	*-1.36*	*0.03*	
1983-2010											
VW expected profitability	3.24	5.78	7.09	8.14	8.90	9.24	9.78	9.98	9.88	11.77	13.98
t-statistic	*6.86*	*12.04*	*13.99*	*16.81*	*17.60*	*18.49*	*22.70*	*25.01*	*22.67*	*30.45*	
VW profitability shock	-1.81	-0.57	0.47	1.01	1.64	1.79	1.79	1.99	1.73	2.41	10.12
t-statistic	*-6.06*	*-2.56*	*2.75*	*4.81*	*6.26*	*7.05*	*7.58*	*7.19*	*5.39*	*8.29*	

Table 4, continued

Panel B: Average equal-weighted expected profitability and profitability shocks											
	Small	2	3	4	5	6	7	8	9	Big	*t*(Small=Big)
1963-2010											
EW expected profitability	5.14	8.36	9.45	10.17	10.92	11.21	11.75	11.71	11.58	13.02	10.21
t-statistic	*8.36*	*13.84*	*17.09*	*20.13*	*21.48*	*22.53*	*25.14*	*28.37*	*28.05*	*27.83*	
EW profitability shock	-1.45	-0.31	0.36	0.62	1.02	1.12	1.07	1.11	0.83	1.03	7.58
t-statistic	*-5.70*	*-1.40*	*2.11*	*3.24*	*4.37*	*4.97*	*4.83*	*4.38*	*3.35*	*5.02*	
1963-1982											
EW expected profitability	9.41	12.29	12.98	13.23	13.92	14.14	14.67	14.24	14.07	16.17	10.84
t-statistic	*19.58*	*20.61*	*28.53*	*27.83*	*29.50*	*30.30*	*35.26*	*41.10*	*41.86*	*40.70*	
EW profitability shock	-0.49	0.10	0.22	0.08	0.16	0.17	0.04	-0.16	-0.35	-0.12	0.90
t-statistic	*-1.50*	*0.24*	*0.64*	*0.24*	*0.46*	*0.59*	*0.13*	*-0.57*	*-1.38*	*-0.45*	
1983-2010											
EW expected profitability	2.24	5.69	7.06	8.10	8.88	9.23	9.77	9.99	9.89	10.89	14.74
t-statistic	*4.93*	*11.88*	*13.95*	*16.75*	*17.51*	*18.48*	*22.57*	*24.75*	*23.65*	*29.30*	
EW profitability shock	-2.13	-0.61	0.46	1.00	1.63	1.79	1.79	2.00	1.66	1.84	11.05
t-statistic	*-6.85*	*-2.68*	*2.73*	*4.85*	*6.26*	*6.93*	*7.67*	*7.25*	*5.67*	*10.22*	

Panel C: Average dispersion in expected profitability and profitability shocks within each size decile											
	Small	2	3	4	5	6	7	8	9	Big	*t*(Small=Big)
1963-2010											
SD expected profitability	8.25	8.50	8.98	8.11	8.33	8.56	7.86	7.56	7.55	7.23	2.05
SD profitability shock	10.27	10.07	9.20	7.84	7.93	7.37	6.30	6.19	5.55	6.33	2.65
1963-1982											
SD expected profitability	6.27	6.75	7.34	7.34	7.88	7.89	8.09	8.03	7.17	8.14	4.49
SD profitability shock	7.02	6.50	6.21	5.95	5.49	5.57	4.90	4.47	3.62	3.73	9.77
1983-2010											
SD expected profitability	9.60	9.70	10.09	8.63	8.63	9.01	7.71	7.25	7.81	6.61	4.54
SD profitability shock	12.56	12.58	11.31	9.16	9.65	8.64	7.28	7.41	6.91	8.17	1.85

Table 5: Average realized and profitability shock-adjusted returns of size deciles

This table reports the average value-weighted (Panel A) and equal-weighted (Panel B) realized and profitability shock-adjusted returns and their corresponding *t*-statistics of the size decile portfolios as well as the return differences between Deciles 1 and 10. Realized returns are in excess of the 1-month T-Bill rate. Adjusted returns 1 are computed by subtracting from a firm's realized return each month the product between its profitability shock and the price impact per unit of profitability shock (the return difference between the highest and lowest profitability shock-sorted quintile portfolios divided by the difference in profitability shocks between the two extreme quintiles). Adjusted returns 2 are similar to Adjusted returns 1 but compute the price impact measure using the monthly coefficient of regressing individual stock returns on profitability shocks. The table reports results for the full 1963:07-2010:12 sample period and for the 1963:07-1983:06 and 1983:07-2010:12 subperiods.

Panel A: Average value-weighted realized and adjusted returns

	Small	2	3	4	5	6	7	8	9	Big	Small-Big
1963:07-2010:12											
VW realized return	1.02	0.73	0.72	0.67	0.70	0.56	0.60	0.56	0.49	0.35	0.67
t-statistic	*3.67*	*2.64*	*2.70*	*2.62*	*2.82*	*2.37*	*2.59*	*2.51*	*2.34*	*1.85*	*3.23*
VW adjusted return 1	1.11	0.79	0.72	0.62	0.62	0.47	0.51	0.50	0.44	0.21	0.90
t-statistic	*4.08*	*2.86*	*2.69*	*2.45*	*2.52*	*2.00*	*2.23*	*2.22*	*2.10*	*1.12*	*4.47*
VW adjusted return 2	1.11	0.79	0.72	0.62	0.61	0.46	0.50	0.48	0.43	0.19	0.92
t-statistic	*4.09*	*2.87*	*2.69*	*2.41*	*2.47*	*1.93*	*2.16*	*2.14*	*2.05*	*1.00*	*4.61*
1963:07-1983:06											
VW realized return	1.33	0.98	0.89	0.84	0.80	0.58	0.50	0.52	0.29	0.13	1.19
t-statistic	*2.79*	*2.19*	*2.08*	*2.07*	*2.10*	*1.57*	*1.38*	*1.53*	*0.94*	*0.49*	*3.40*
VW adjusted return 1	1.28	0.97	0.90	0.84	0.82	0.58	0.54	0.59	0.40	0.16	1.12
t-statistic	*2.72*	*2.21*	*2.11*	*2.10*	*2.17*	*1.58*	*1.52*	*1.75*	*1.32*	*0.58*	*3.22*
VW adjusted return 2	1.26	0.97	0.90	0.83	0.81	0.57	0.54	0.58	0.40	0.15	1.12
t-statistic	*2.70*	*2.19*	*2.10*	*2.07*	*2.14*	*1.56*	*1.50*	*1.74*	*1.31*	*0.54*	*3.22*
1983:07-2010:12											
VW realized return	0.79	0.55	0.60	0.54	0.62	0.54	0.67	0.59	0.63	0.51	0.28
t-statistic	*2.40*	*1.56*	*1.76*	*1.66*	*1.92*	*1.78*	*2.23*	*1.98*	*2.24*	*1.98*	*1.14*
VW adjusted return 1	0.99	0.65	0.58	0.46	0.48	0.39	0.49	0.43	0.46	0.25	0.74
t-statistic	*3.05*	*1.85*	*1.72*	*1.41*	*1.47*	*1.27*	*1.64*	*1.43*	*1.64*	*0.96*	*3.09*
VW adjusted return 2	1.00	0.65	0.58	0.46	0.47	0.37	0.47	0.41	0.45	0.22	0.78
t-statistic	*3.10*	*1.88*	*1.71*	*1.38*	*1.42*	*1.20*	*1.55*	*1.34*	*1.57*	*0.84*	*3.30*

Table 5, continued

Panel B: Average equal-weighted realized and adjusted returns											
	Small	2	3	4	5	6	7	8	9	Big	Small-Big
1963:07-2010:12											
EW realized return	1.20	0.75	0.72	0.68	0.70	0.56	0.59	0.56	0.49	0.37	0.84
t-statistic	*4.32*	*2.71*	*2.71*	*2.64*	*2.81*	*2.36*	*2.58*	*2.50*	*2.33*	*1.86*	*3.99*
EW adjusted return 1	1.31	0.81	0.72	0.63	0.62	0.47	0.51	0.50	0.45	0.28	1.04
t-statistic	*4.78*	*2.93*	*2.70*	*2.48*	*2.52*	*1.99*	*2.23*	*2.21*	*2.12*	*1.40*	*5.09*
EW adjusted return 2	1.31	0.81	0.72	0.62	0.61	0.45	0.50	0.48	0.44	0.26	1.05
t-statistic	*4.80*	*2.94*	*2.70*	*2.45*	*2.47*	*1.91*	*2.16*	*2.13*	*2.07*	*1.32*	*5.21*
1963:07-1983:06											
EW realized return	1.46	1.00	0.90	0.85	0.80	0.59	0.49	0.51	0.30	0.17	1.29
t-statistic	*3.00*	*2.24*	*2.09*	*2.09*	*2.09*	*1.57*	*1.37*	*1.50*	*0.98*	*0.56*	*3.63*
EW adjusted return 1	1.43	0.99	0.90	0.85	0.82	0.59	0.54	0.58	0.42	0.23	1.20
t-statistic	*2.99*	*2.25*	*2.12*	*2.11*	*2.16*	*1.59*	*1.51*	*1.73*	*1.35*	*0.78*	*3.44*
EW adjusted return 2	1.42	0.98	0.90	0.84	0.81	0.58	0.54	0.58	0.42	0.22	1.20
t-statistic	*2.97*	*2.23*	*2.11*	*2.09*	*2.13*	*1.56*	*1.50*	*1.73*	*1.35*	*0.75*	*3.44*
1983:07-2010:12											
EW realized return	1.02	0.57	0.59	0.55	0.62	0.54	0.67	0.60	0.63	0.52	0.50
t-statistic	*3.11*	*1.61*	*1.75*	*1.67*	*1.90*	*1.75*	*2.24*	*2.00*	*2.21*	*1.95*	*1.99*
EW adjusted return 1	1.23	0.67	0.58	0.47	0.48	0.38	0.49	0.43	0.47	0.31	0.92
t-statistic	*3.81*	*1.91*	*1.72*	*1.44*	*1.47*	*1.25*	*1.65*	*1.44*	*1.63*	*1.17*	*3.77*
EW adjusted return 2	1.23	0.68	0.58	0.47	0.47	0.36	0.47	0.41	0.45	0.29	0.94
t-statistic	*3.87*	*1.94*	*1.72*	*1.41*	*1.42*	*1.17*	*1.56*	*1.34*	*1.57*	*1.08*	*3.96*

Table 6: Cross-sectional regressions of realized and profitability shock-adjusted returns on size

This table reports the average coefficients and their time series *t*-statistics from monthly Fama and MacBeth (1973) cross-sectional regressions of individual stocks' realized and profitability shock-adjusted returns on the natural logarithms of size and BE/ME. Realized returns are in excess of the 1-month T-Bill rate. Adjusted returns 1 are computed by subtracting from a firm's realized return each month the product between its profitability shock and the price impact per unit of profitability shock (the return difference between the highest and lowest profitability shock-sorted quintile portfolios divided by the difference in profitability shocks between the two extreme quintiles). Adjusted returns 2 are similar to Adjusted returns 1 but compute the price impact measure using the monthly coefficient of regressing individual stock returns on profitability shocks. We estimate the cross-sectional regressions for each month from 1963:07 to 2010:12. The table reports the results for the full 1963:07-2010:12 sample period and for the 1963:07-1983:06 and 1983:07-2010:12 subperiods.

Dependent variable:	Realized return	Adjusted return 1	Adjusted return 2
1963:07-2010:12			
Intercept	2.26	2.72	2.75
t-statistic	*3.56*	*4.38*	*4.50*
Ln(size)	-0.12	-0.15	-0.16
t-statistic	*-2.76*	*-3.68*	*-3.81*
Ln(BE/ME)	0.30	0.29	0.29
t-statistic	*3.73*	*3.69*	*3.73*
Adj. R^2	0.03	0.02	0.02
1963:07-1983:06			
Intercept	2.98	2.58	2.54
t-statistic	*2.78*	*2.44*	*2.41*
Ln(size)	-0.19	-0.15	-0.15
t-statistic	*-2.63*	*-2.16*	*-2.13*
Ln(BE/ME)	0.28	0.34	0.35
t-statistic	*2.41*	*3.03*	*3.10*
Adj. R^2	0.04	0.03	0.03
1983:07-2010:12			
Intercept	1.74	2.83	2.90
t-statistic	*2.25*	*3.77*	*4.00*
Ln(size)	-0.07	-0.16	-0.16
t-statistic	*-1.29*	*-3.03*	*-3.27*
Ln(BE/ME)	0.31	0.25	0.25
t-statistic	*2.84*	*2.33*	*2.31*
Adj. R^2	0.02	0.02	0.02

Table 7: Time-series regressions of the profitability shock-adjusted size premium on discount rate shock proxies

This table reports the coefficients and *t*-statistics from time-series regressions of the value-weighted size premium computed using profitability shock-adjusted returns on returns of mimicking portfolios for discount rate shocks. The discount rate proxies consist of : the dividend yield on the CRSP value-weighted market index, the yield spread between the 10-year T-Bond and the 3-month T-Bill (term spread), the yield spread between the BAA and AAA corporate bonds (default spread), and the 3-month T-Bill rate. The mimicking portfolios for discount rate shocks are constructed using the fitted values from time-series regressions of innovations in the discount rate proxies on the excess returns of 30 industry portfolios (base assets) downloaded from Ken French's Web site. The innovations in the discount rate proxies are measured using the first differences as well as the forecast errors from an AR(1) model. Adjusted returns 1 are computed by subtracting from a firm's realized return each month the product between its profitability shock and the price impact per unit of profitability shock (the return difference between the highest and lowest profitability shock-sorted quintile portfolios divided by the difference in profitability shocks between the two extreme quintiles). Adjusted returns 2 are similar to Adjusted returns 1 but compute the price impact measure using the monthly coefficient of regressing individual stock returns on profitability shocks. The table reports the results for the full 1964:01-2010:12 sample period and for the 1964:07-1983:06 and 1983:07-2010:12 subperiods.

Dependent variable:	Adjusted size premium 1	Adjusted size premium 1	Adjusted size premium 2	Adjusted size premium 2
Innovation:	*First difference*	*AR(1)*	*First difference*	*AR(1)*
1964:01-2010:12				
Intercept (in %)	0.93	0.91	0.95	0.93
t-statistic	*4.187*	*4.72*	*5.00*	*4.84*
Dividend yield	-2.98	-3.10	-2.61	-2.76
t-statistic	*-1.74*	*-1.79*	*-1.53*	*-1.60*
Term spread	-0.01	-0.01	-0.02	-0.01
t-statistic	*-0.64*	*-0.47*	*-0.75*	*-0.54*
Default spread	-0.41	-0.39	-0.40	-0.38
t-statistic	*-6.46*	*-5.91*	*-6.29*	*-5.71*
T-Bill rate	-0.03	-0.03	-0.03	-0.03
t-statistic	*-1.43*	*-1.38*	*-1.58*	*-1.49*
Adj. R^2	0.11	0.10	0.10	0.09
1964:01-1983:06				
Intercept (in %)	1.17	1.18	1.17	1.18
t-statistic	*3.71*	*3.66*	*3.71*	*3.66*
Dividend yield	-7.75	-8.49	-7.69	-8.42
t-statistic	*-2.79*	*-2.90*	*-2.78*	*-2.97*
Term spread	-0.00	0.02	-0.00	0.02
t-statistic	*-0.10*	*0.52*	*-0.10*	*0.51*
Default spread	-0.49	-0.38	-0.49	-0.38
t-statistic	*-3.99*	*-2.84*	*-3.99*	*-2.84*
T-Bill rate	-0.05	-0.03	-0.06	-0.03
t-statistic	*-1.55*	*-0.90*	*-1.57*	*-0.92*
Adj. R^2	0.18	0.15	0.18	0.15

Table 7, continued

Dependent variable:	Adjusted size premium 1	Adjusted size premium 1	Adjusted size premium 2	Adjusted size premium 2
Innovation:	*First difference*	*AR(1)*	*First difference*	*AR(1)*
1983:07-2010:12				
Intercept (in %)	0.84	0.84	0.87	0.81
t-statistic	*3.73*	*3.67*	*3.93*	*3.66*
Dividend yield	2.52	3.00	3.09	3.29
t-statistic	*1.22*	*1.43*	*1.51*	*1.62*
Term spread	-0.03	-0.03	-0.03	-0.04
t-statistic	*-1.22*	*-1.37*	*-1.38*	*-1.58*
Default spread	-0.41	-0.45	-0.40	-0.42
t-statistic	*-6.01*	*-6.29*	*-5.82*	*-6.00*
T-Bill rate	-0.00	-0.01	-0.01	-0.01
t-statistic	*-0.07*	*-0.35*	*-0.23*	*-0.64*
Adj. R^2	0.14	0.15	0.13	0.13

Table 8: Average realized and profitability shock-adjusted returns of small and big firms: January versus other months

This table reports the average value-weighted (Panel A) and equal-weighted (Panel B) realized and profitability shock-adjusted returns of size Deciles 1 (small firms) and 10 (big firms) and their corresponding *t*-statistics as well as the return differences between Deciles 1 and 10 for January and for February-December separately. The table reports the results for the full 1963:07-2010:12 sample period and for the 1963:07-1983:06 and 1983:07-2010:12 subperiods.

Panel A: Average value-weighted realized and adjusted returns

	January				February to December		
	Small firms	Big firms	Small-Big		Small firms	Big firms	Small-Big
1963:07-2010:12				**1963:07-2010:12**			
VW realized return	6.70	0.81	5.89	VW realized return	0.50	0.31	0.19
t-statistic	*5.44*	*1.08*	*6.56*	*t-statistic*	*1.86*	*1.58*	*0.98*
VW adjusted return 1	6.67	0.78	5.88	VW adjusted return 1	0.61	0.16	0.45
t-statistic	*5.56*	*1.04*	*6.82*	*t-statistic*	*2.28*	*0.82*	*2.32*
VW adjusted return 2	6.63	0.84	5.79	VW adjusted return 2	0.61	0.13	0.48
t-statistic	*5.53*	*1.11*	*6.76*	*t-statistic*	*2.30*	*0.67*	*2.49*
1963:07-1983:06				**1963:07-1983:06**			
VW realized return	8.79	0.52	8.27	VW realized return	0.63	0.10	0.53
t-statistic	*3.95*	*0.42*	*5.80*	*t-statistic*	*1.40*	*0.35*	*1.63*
VW adjusted return 1	8.57	0.53	8.04	VW adjusted return 1	0.60	0.12	0.47
t-statistic	*3.94*	*0.44*	*5.67*	*t-statistic*	*1.34*	*0.45*	*1.46*
VW adjusted return 2	8.57	0.53	8.04	VW adjusted return 2	0.58	0.11	0.47
t-statistic	*3.94*	*0.44*	*5.67*	*t-statistic*	*1.31*	*0.40*	*1.46*
1983:07-2010:12				**1983:07-2010:12**			
VW realized return	5.10	1.04	4.06	VW realized return	0.41	0.46	-0.05
t-statistic	*3.92*	*1.09*	*3.92*	*t-statistic*	*1.23*	*1.73*	*-0.22*
VW adjusted return 1	5.21	0.98	4.23	VW adjusted return 1	0.62	0.18	0.43
t-statistic	*4.10*	*1.00*	*4.35*	*t-statistic*	*1.88*	*0.68*	*1.81*
VW adjusted return 2	5.13	1.08	4.06	VW adjusted return 2	0.63	0.14	0.48
t-statistic	*4.06*	*1.09*	*4.31*	*t-statistic*	*1.95*	*0.53*	*2.06*

Table 8, continued

Panel B: Average equal-weighted realized and adjusted returns							
	January				February to December		
	Small firms	Big firms	Small-Big		Small firms	Big firms	Small-Big
1963:07-2010:12				**1963:07-2010:12**			
EW realized return	7.73	0.71	7.02	EW realized return	0.61	0.34	0.27
t-statistic	*6.20*	*0.94*	*7.51*	*t-statistic*	*2.28*	*1.65*	*1.41*
EW adjusted return 1	7.68	0.72	6.96	EW adjusted return 1	0.74	0.24	0.50
t-statistic	*6.32*	*0.94*	*7.77*	*t-statistic*	*2.78*	*1.15*	*2.63*
EW adjusted return 2	7.64	0.77	6.87	EW adjusted return 2	0.74	0.22	0.52
t-statistic	*6.30*	*1.00*	*7.75*	*t-statistic*	*2.80*	*1.05*	*2.77*
1963:07-1983:06				**1963:07-1983:06**			
EW realized return	9.61	0.36	9.26	EW realized return	0.69	0.15	0.55
t-statistic	*4.18*	*0.27*	*6.27*	*t-statistic*	*1.53*	*0.49*	*1.71*
EW adjusted return 1	9.37	0.38	8.99	EW adjusted return 1	0.69	0.21	0.47
t-statistic	*4.16*	*0.30*	*6.12*	*t-statistic*	*1.53*	*0.71*	*1.51*
EW adjusted return 2	9.37	0.38	8.99	EW adjusted return 2	0.68	0.21	0.47
t-statistic	*4.16*	*0.30*	*6.13*	*t-statistic*	*1.51*	*0.69*	*1.50*
1983:07-2010:12				**1983:07-2010:12**			
EW realized return	6.29	0.99	5.30	EW realized return	0.55	0.48	0.07
t-statistic	*4.87*	*1.07*	*4.77*	*t-statistic*	*1.70*	*1.72*	*0.30*
EW adjusted return 1	6.38	0.98	5.40	EW adjusted return 1	0.77	0.25	0.52
t-statistic	*5.07*	*1.03*	*5.21*	*t-statistic*	*2.40*	*0.91*	*2.20*
EW adjusted return 2	6.30	1.07	5.24	EW adjusted return 2	0.78	0.22	0.56
t-statistic	*5.05*	*1.12*	*5.23*	*t-statistic*	*2.47*	*0.79*	*2.42*

Table 9: Average expected profitability and profitability shocks of small and big firms: New lists versus seasoned firms, 1983-2010

This table reports, for new lists and seasoned firms separately, the average value-weighted (Panel A) and equal-weighted (Panel B) expected profitability and profitability shocks of size Deciles 1 (small firms) and 10 (big firms) and their corresponding *t*-statistics for the 1983-2010 subperiod. New lists and seasoned firms are defined as firms that have been listed for less than and more than five years, respectively, based on their first appearance (PERMCO) on CRSP. Expected profitability is the profitability forecast based on the cross-sectional profitability model. Profitability shock is the difference between realized profitability and expected profitability. The table also reports the *t*-statistics for the hypotheses that the expected profitability and profitability shock of small firms are equal to those of big firms.

Panel A: Average value-weighted expected profitability and profitability shocks

	New lists				**Seasoned firms**		
	Small firms	Big firms	*t*(Small=Big)		Small firms	Big firms	*t*(Small=Big)
1983-2010				**1983-2010**			
VW expected profitability	1.25	12.00	5.69	VW expected profitability	3.77	11.82	14.21
t-statistic	*1.57*	*7.00*		*t-statistic*	*9.19*	*30.30*	
VW profitability shock	-4.19	0.41	2.72	VW profitability shock	-1.15	2.51	8.38
t-statistic	*-8.76*	*0.25*		*t-statistic*	*-4.15*	*7.44*	

Panel B: Average equal-weighted expected profitability and profitability shocks

	New lists				**Seasoned firms**		
	Small firms	Big firms	*t*(Small=Big)		Small firms	Big firms	*t*(Small=Big)
1983-2010				**1983-2010**			
EW expected profitability	0.10	11.00	6.17	EW expected profitability	2.79	10.98	15.21
t-statistic	*0.13*	*6.82*		*t-statistic*	*6.92*	*30.82*	
EW profitability shock	-4.50	-0.18	1.96	EW profitability shock	-1.51	2.09	9.36
t-statistic	*-9.27*	*-0.08*		*t-statistic*	*-5.17*	*8.36*	

Table 10: Average expected profitability and profitability shocks of small and big firms: Industries with structural shifts versus other industries, 1983-2010

This table reports, separately for industries that experience significant changes in their market structure due to trade liberalization or deregulation and industries that do not, the average value-weighted (Panel A) and equal-weighted (Panel B) expected profitability and profitability shocks of size Deciles 1 (small firms) and 10 (big firms) and their corresponding *t*-statistics for the 1983-2010 subperiod. The list of industries that experience deregulation or increased foreign competition is obtained from Mitchell and Mulherin (1996). Expected profitability is the profitability forecast based on the cross-sectional profitability model. Profitability shock is the difference between realized profitability and expected profitability. The table also reports the *t*-statistics for the hypotheses that the expected profitability and profitability shock of small firms are equal to those of big firms.

Panel A: Average value-weighted expected profitability and profitability shocks

	Industries with structural shifts				**Other industries**		
	Small firms	Big firms	*t*(Small=Big)		Small firms	Big firms	*t*(Small=Big)
1983-2010				**1983-2010**			
VW expected profitability	1.94	12.81	13.57	VW expected profitability	4.77	10.46	12.81
t-statistic	*3.05*	*26.29*		*t-statistic*	*15.01*	*33.80*	
VW profitability shock	-2.67	3.26	10.16	VW profitability shock	-0.79	1.29	7.43
t-statistic	*-6.54*	*7.82*		*t-statistic*	*-3.65*	*7.26*	

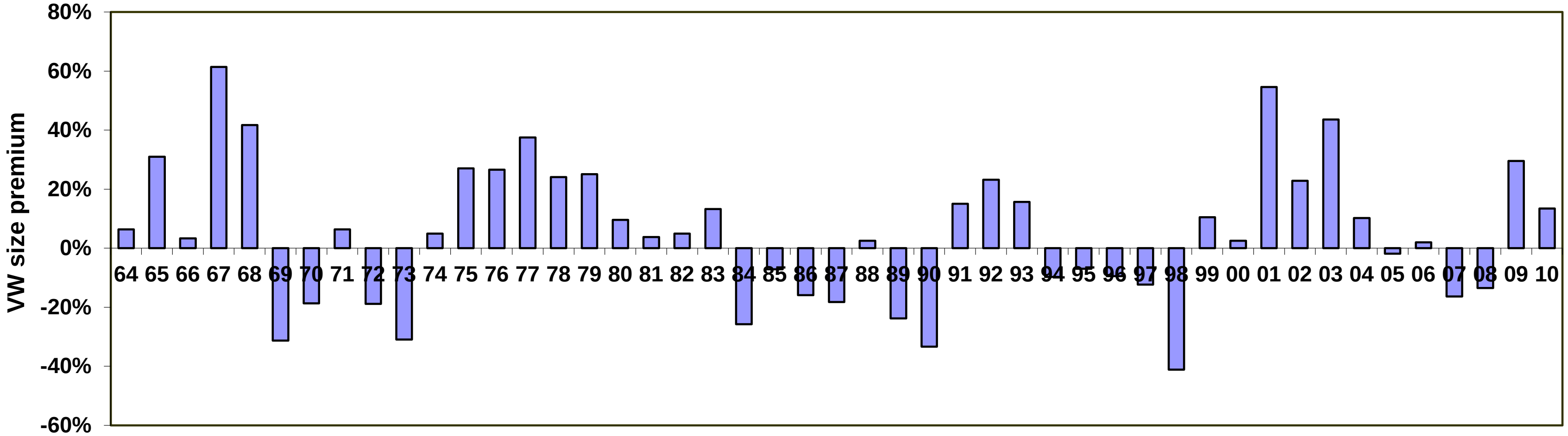
Panel B: Average equal-weighted expected profitability and profitability shocks

	Industries with structural shifts				**Other industries**		
	Small firms	Big firms	*t*(Small=Big)		Small firms	Big firms	*t*(Small=Big)
1983-2010				**1983-2010**			
EW expected profitability	0.87	11.85	13.71	EW expected profitability	3.90	9.97	14.36
t-statistic	*1.37*	*23.95*		*t-statistic*	*13.12*	*33.20*	
EW profitability shock	-2.99	2.63	10.99	EW profitability shock	-1.07	1.10	7.38
t-statistic	*-7.31*	*8.58*		*t-statistic*	*-4.69*	*5.94*	

Figure 1: Time-series plot of the size premium

This figure plots the annualized value-weighted (Panel A) and equal-weighted (Panel B) size premium from 1964 to 2010.

Panel A: Value-weighted size premium



Panel B: Equal-weighted size premium