

## Are Size And Book-To-Market Effects, Risk Compensations? Evidence from the Tunisian Stock Exchange

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### Abstract

*The bulk of existing research on the relation of size and book-to-market equity (BE/ME) effects with financial distress risk relates to United States and other developed capital markets. Little, if any, has been published on the robustness of risk-based explanation of size and BE/ME effects in emerging and little markets such as the Tunisian stock market. This paper, firstly, updates earlier investigation on the relation of stock returns with size and BE/ME ratio for equities listed in the Tunisian stocks 'market. The evidence we find support the presence of stronger and more pronounced Size and BE/ME effects in the Tunisian stocks 'market over the period from July 1998 to December 2010. Secondly, this study examines whether size and BE/ME are related to some market and accounting based measures of financial distress risk. Consistent with the risk-based explanation, our results give evidence that Tunisian value stocks and small stocks are riskier because they are usually firms under distress. They have persistent poor performance, higher financial leverage and face substantially uncertainty in future earnings. Results of our study provide out-of sample evidence (outside US and other developed markets) on the robustness of risk-based explanation of the most puzzling anomalies: BE/ME and size effects.*

**Keywords:** Size and BE/ME ratio effects, financial distress risk, Tunisian stocks 'market.

### 1. Introduction

A large body of literature documents empirically observed predictable patterns in stock returns that cannot be explained by the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965). They are typically called anomalies. In the United States, among many other important papers Rosenberg and Lanstein (1985), Fama and French (1992,1993,1995, 1996), and Lakonishok, Shleifer, and Vishny(1994) provide evidence for the BE/ME effect: Stocks with high BE/ME ratios tend to have higher average returns relative to stocks with low BE/ME ratios. Pioneering work by Banz (1981) provides evidence for the size effect: average returns on small American stocks (low ME) are too high given their beta estimates and average returns on large stocks are too low. There has been growing international evidence on such effects. Fama and French (1998) report significant value (BE/ME) effects in the major European, Australian and the Far East markets. Arshanapalli, Coggin and Doukas (1998) find size and value effects in 18 global markets; Elfakhani, and al.(1998) report a significant size and a BE/ME in Canada. On the French stock market, Molay (2000) confirms the negative relation between size and average returns and Ajili (2002) confirms the positive relation between BE/ME ratio and average returns.

However, there is an ongoing debate about the economic rationale behind these average returns anomalies. In line with rational asset pricing, Fama and French (1993, 1995, 1996) suggest that these variables proxy for sensitivity to common risk factors in returns. Therefore, they have developed a three-factor asset-pricing model, which relates the expected returns of a portfolio to three factors. Excess return on a market portfolio, a book-to-market equity factor (HML) which is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market, and size factor (SMB) which is the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks. Fama and French (1993, 1995, and 1996) consider HML and SMB as risk premiums compensate for additional risk associated with size and Book-to market equity ratio. Consistent with the risk- based explanation, Chan and Chen (1991) find that size effect is mainly driven by marginal firms in distress, and describe marginal firms as follows:

“They have lost market value because of poor performance, their earnings-to-assets ratios are low, they are inefficient producers and they are likely to have high financial leverage. They are marginal in the sense that their prices tend to be more sensitive to changes in the economy and they are less likely to survive adverse economic conditions”. Fama and French (1996) use the term “relative distress” in a similar fashion. Fama and French (1995) show that depressed earnings in the past and uncertainty in the futures are also a common characteristic among firms that have high book-to-market equity (BE/ME) ratio. They also find a size effect in earnings (small firms tend to have lower earnings on book equity than do big firms). Chen and Zhang (1998) found that value stocks (stocks with high BE/ME ratio) are riskier because they are usually firms under distress, have high financial leverages and face substantial uncertainty in future earnings. Indeed, value stocks offer reliability higher returns in US, Japan, Hong Kong and Malaysia corresponding to the higher risk, but this not the case in the high-growth markets of Taiwan and Thailand. Campbell, Hilsher and Szilagy (2006) find that U.S firms with lower market capitalization and higher Market-to-Book equity ratio, over the period 1963 to 2003, are more likely to file for bankruptcy, be delisted or receive a D (Default) rating. Vassalou and Xing (2004) computed a default risk measure using Merton’s (1974) option pricing model. They examined the interaction of default risk and firm characteristics such as size and BE/ME in United States. They find that size and BE/ME effects bear a close relation with default risk. Indeed, the size and BE/ME effects exist only among higher default risk firms.

Once stocks with the 30% highest default probability, are excluded from the sample, both size and BE/ME affects disappear. Avramo, Chordia, Jostova and Phipov (2013) measure distress risk through credit downgrades. They argue that value strategies are profitable because they take long positions in high credit risk firms subject to distress risk. The concept of financial distress is often invoked in the asset pricing literature to explain anomalous patterns in the cross-section of stock returns, such as size and BE/ME effects. The idea is that certain companies, like small and high BE/ME ones, are more likely to encounter difficulties to meet their financial obligations and investors charge a premium for bearing this risk. Despite the relation of size and BE/ME with financial distress risk is examined and confirmed in many financial markets, nevertheless the researcher were often interested with US and other developed markets. We note that little, if any, has been published on the robustness of risk-based explanation of BE/ME and size effects in emerging and little markets, such as the Tunisian Stock Exchange (Bourse des Valeurs Mobilières de Tunis (BVMT)). This paper extends the previous literature by considering the relation of size and BE/ME ratio with financial distress related fundamentals in the Tunisian stock’s market which accounts slightly less than 100 listed securities.

The main purpose of this paper is to examine whether these two variables are related to the economic fundamentals of profitability and risk. To this end, we use some market and accounting based profitability and leverage ratios as proxies for the risk of financial distress and examine the relation of these ratios with BE/ME and size in portfolios formed on size and book-to-market equity. These are financial ratios, chosen based on their popularity and their performance in previous studies in assessing the risk of financial distress<sup>1</sup>. We have limited the financial ratios to analyze, to those used in previous studies interested on the relationship of the size and BE/ME ratio with financial distress to make our study comparable to them. The remainder of the paper is organized as follows. Section 2 describes the Tunisian stock exchange. Section 3 documents the size and BE/ME ratio effects in the Tunisian stocks’ market. Section 4 examines the relationship of the size and BE/ME ratio with profitability. The fifth section examines the relationship of the size and BE/ME ratio with financial distress risk indicator and section 6 concludes main findings.

## **2. The Tunisian stock exchange (BVMT)**

The Tunisian stock exchange (Bourse de Valeurs Mobilières de Tunis) was founded in 1969 but remained dormant until 1989, date from which, Tunisia has been undertaking reforms of its financial sector as part of a broader macroeconomic adjustment program and structural reforms undertaken since 1987. Key elements of the reform were the liberalization of interest rates, the improvement of banking supervision and the introduction of more market-based instruments of monetary policy. The 1989 law had defined main features and rules of functioning of the Tunis Stock exchange. Nevertheless, this law had shortcomings that discourage the issue of new securities. It concentrates regulation and management in one public sector institution, it did not provide for a modern settlement system and brokerage activities were under the control of the banks.

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<sup>1</sup> Altman (1968) and other authors such as Chen and Zhang (1998) confirm the importance of financial ratios derived from financial statements in predicting the financial distress of the company.

In 1994, another law was passed that included most features of OECD stock markets (a private bourse, private brokerage firms, and a modern settlement system and regulatory framework). In 1996, implementation of the NSC electronic trading system. In 1997, launch of the alternative market dedicated to small and medium enterprises. These improvements encourage the test of size and BE/ME effect on Tunisian stock returns and whether they are related to financial distress risk.

### **3. Size and BE/ME effects in the Tunisian stock market**

We have examined the existence of size and BE/ME effects in the Tunisian stocks' market in an earlier paper over the period from July 1998 to December 2004<sup>2</sup>. Using the methodology of Fama and French (1993), results in Bergaoui (2013) confirm the presence of a pronounced BE/ME effect. However, the negative relation between size and average stock returns was limited to high book-to-market equity stocks category. In this paper, we extend our study period to December 2010. Indeed, in 2008 large numbers of Tunisian firms entrance the Tunisian stock market (BVMT). With larger number of listed companies and longer study period, tests and results concerning size and BE/ME effects in the Tunisian context should be stronger.

#### **3.1 Data description and methodology**

##### **3.1. 1. Data sources**

Consistent with prior research, the sample includes only non-financial firms that trade in the Tunisian stock exchange (BVMT) during 1998-2010. Monthly stock prices, ME, and accounting data are obtained from the BVMT's electronic data base.

##### **3.1.2. Portfolio construction**

We have formed size and book-to-market portfolios, similar to that of Fama and French [1993, 1995]. To be included in a portfolio, a firm must be trading in BVMT both in December (t-1) and in June (t). Stocks with negative BE/ME are eliminated, as they do not have meaningful explanations. The number of firms that fulfill the data requirements range from 15 in 1998 to 28 in 2010. At the end of June of each year (t), stocks are assigned to two portfolios of size (Small and big) based on whether their June market equity (ME) (defined as the product of the closing price times the number of shares outstanding as of June (t)) is above or below the median ME. The same stocks are allocated in an independent sort to three BE/ME portfolios. Designed as Low (L), Medium (M) and High (H). The BE/ME partitioning is based on the breakpoints for the bottom 30%, middle 40% and the top 30% of the BE/ME value in December (t-1), for the BVMT stocks. Since the Tunisian stock market is likely to be less efficient than the more developed markets, a period of six months, from December (t-1) to June (t) could be sufficient for the market to react to any new information in the annual reports. Six size, BE/ME portfolios are formed at the intersection of the two firm size portfolios and three book-to-market equity portfolios. The six portfolios formed are S/L, S/M, S/H, B/L, B/M and B/H. The ranking is redone each year and the portfolio composition changes due to the change in the size and BE/ME values of firms listed in BVMT. Monthly value-weighted returns on the six portfolios are calculated from July of year (t) to June of year (t+1).

#### **3.2. Performance of six portfolios: A detection of some size and BE/ME effect**

Fama and French (1993) note that, to ensure that the accounting variables are known before the returns they are used to explain, they match the accounting data for fiscal year ends in calendar year (t-1) with returns for July of year (t) to June of year (t+1). Table (1) summarizes average returns from 1998 through 2010 for six size- BE/ME portfolios. Value premium measured by the difference between High and Low BE/ME portfolios returns (H-L), and size premium measured by the difference between small and big size portfolios, are also reported in table (1). Table (1) reports that excess returns of the six stock portfolios considered are positive, they range from 0.11% per month for B/L portfolio to 3.716% per month for S/H portfolio. We find that the two stock portfolios with high BE/ME ratio produces returns in excess of the two stock portfolios with low BE/ME ratio. Table (1), reports that the value premium (H-L) range from 2.138% for big firms to 2.496 % for small ones (compared to 0.485% for big stocks and 1.008% for small ones, over the period July 1998-december 2004, in our earlier paper).

Using larger sample, we find a stronger and more pronounce BE/ME effects. We conclude that, book-to-market equity effect decrease with size.

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<sup>2</sup>Bergaoui N (2013):" Book-to-market equity and size as determinants of returns; Evidence from the Tunisian stock exchange" modern economy: problems, trends, prospects, June, issue 8, pp 48.

This result is consistent with findings of Fama and French (1993), Kothari, Shanken and Sloan (1995), Loughran (1997) and Daniel, Titman and Wei (2001). The negative relation between size and average returns is observed for the three BE/ME portfolios. Table (1) shows that the difference between the average returns for small and big stocks (S-B) range from 1.11% for the lowest BE/ME portfolio to 1.468% for the highest BE/ME one.. This confirms the presence of stronger size effect in the BVMT during the period from July 1998 to December 2010 compared to what we find in Bergaoui (2013). Consistently with results of Fama and French (1993) we have found that S/H portfolio has the highest returns. Results reported in table (1) have implications for investor in the Tunisian stocks' market exchange. Indeed, to release higher returns, they can invest in the S/H portfolio or they can choose a strategy that is long on S/H portfolio and short on B/L portfolios (that has the lowest returns). This superior return isn't associated with superior risk? In the next sections, we explore the reasons for size and BE/ME effects, and we examine the risk facing small stocks and value stocks.

#### **4. The relationship of the size and BE/ME ratio with profitability:**

We selected two measures of profitability: return-to-asset and the return-to-book equity. Fama and French (1995) examine the behavior of measures of profitability for the 11 years around portfolio formation. The purpose was to study the evolution of profitability for long period before and after firms are ranked on size and BE/ME. Whereas Chen and Zhang (1998) examine the behavior of profitability and risk characteristics of S/H and B/L portfolios, 7 years around portfolio formation (3 years before and three years after the formation year). In our study, we analyze the behavior of return-to-asset and return-to-book equity of size and BE/ME portfolios 5 years around portfolios formation<sup>3</sup>.

##### **4.1. return-to-asset as a measure of the profitability:**

It is defined as earnings before interest and tax (operating income OI) divided by the asset value (A). It is used by Chan and Chen (1991), Loughran (1997) and Chen and Zhang (1998) as measure of operating performance.<sup>4</sup> Several studies highlight the importance of operating performance, as measured by return-to-asset, as indicator of financial distress (Altman (1968); Kahl (2001)<sup>5</sup>; Campbell, Hilsher and Szilagy (2006)<sup>6</sup>). Indeed, the ultimate existence of the firm depends on the ability of its assets to generate revenue. For each portfolio formation year  $t$  ( $t=1998$  to  $2010$ ), the ratios of return-to-asset  $OI(t+i)/A(t+i-1)$  are calculated for year  $t+i$ ,  $i=-2, \dots, 2$ , using firms with accounting data for years  $t+i$  and  $t+i-1$ . The ratio for year  $t+i$  is then averaged across portfolio formation years. Table (2) shows mean values of  $OI(t+i)/A(t+i-1)$  for 5 years around portfolio formation. The " $i<0$ " refers to the average for year  $i=-1, -2$  before the portfolio formation,  $i=0$  is the formation year, and " $i>0$ " is the average for year  $i=1, 2$  after formation.

Table (2) shows that, consistent with the results of Fama and French (1995) and Chen and Zhang (1998), book-to-market-equity is associated with persistent differences in profitability. Low- BE/ME stocks are on average more profitable than high-BE/ME stocks for two years before and two years after portfolio formation. Profitability is also related to size. Small stocks have persistently lower OI/A than big stocks. Like Fama and French (1995), we find that BE/ME is a stronger indicator of profitability than size. The size effect in profitability is conditional. Given that BE/ME is high (or low), small stocks on average have lower OI/A than big stocks. In contrast the relation between BE/ME and OI/A is unconditional. Both low-BE/ME portfolios have higher OI/A than either high-BE/ME portfolio.

<sup>3</sup> Because of entrance and exit of some firms from the BVMT universe, financial and accounting data of some firms in Size-BE/ME portfolios are not available beyond two years before and two years after portfolio formation.

<sup>4</sup>Altman (1968) uses it for the determination of the Z-score, which is widely accepted as a measure of default risk.

<sup>5</sup>Kahl (2001) analyses the factors that affect the survival probability of firms throughout the process of financial distress on a sample of 102 U.S. companies entering financial distress between 1979 and 1993. He finds that operating performance as measured by return on assets has positive and statistically significant effect (at the 1% level) on the firm's short-run and long run survival probability. According to Kahl (2001), creditors and other investors learn about the viability of a financially distressed company by observing the evolution of its operating performance over time.

<sup>6</sup>Campbell, Hilsher and Szilagy (2006) explore the determinants of failure to meet financial obligations of U.S firms over the period January 1963-December 2003.They use a broadly definition of failures, that includes bankruptcies, delisting, or D ratings issued by a leading credit rating agency. They found that a one standard deviation increase in operating performance (as measured by return on assets) (for a firm that initially has sample mean values of the considered ratio) reduces the probability of failure by 44% of its initial value.

#### 4.2. return-to-book equity as a measure of the profitability:

Our second measure of profitability is  $EI(t) / BE(t-1)$ , the ratio of common equity income for the fiscal year ending in calendar year (t) to the book value of common equity for year (t-1).  $EI(t)$  is earnings after depreciation, taxes and interest. It measure the return received by shareholders relative to their book value of equity. This ratio is used by Fama and French (1995) and Chen and Zhang (1998). For each portfolio formation year t (t=1998 to 2010), the ratios of return-to-book equity  $EI(t+i) / BE(t+i-1)$  are calculated for year t+i,  $i = -2, \dots, 2$ , using firms with accounting data for years t and t+i.

The ratio for year (t+i) is then averaged across portfolio formation years (t). Table (3) shows mean values of  $EI(t+i) / BE(t+i-1)$  for 5 years around portfolio formation. Table (3) shows that high-BE/ME stocks consistently have lower return-to-equity ratios than low-BE/ME for both small and big firms. Consistent with the risk-based explanation, small stocks on average have lower EI/BE than big stocks two years before and two years after portfolio formation year. This result is confirmed for both types of stocks with high and with low BE/ME ratio. The evidence presented in tables (2) and (3) shows that size and BE/ME are related to profitability. Firms with high BE/ME tend to be persistently distressed. They have low ratios of return-to-assets and return-to- book equity for 5 years around portfolio formation. Conversely, low BE/ME is associated with sustained strong profitability. Within book-to-market groups, small stocks tend to be less profitable than big stocks.

Fama and French (1995) show that in the American stock market, the book-to-market ratio is persistent like profitability. To test this hypothesis in the Tunisian stock market, we have calculated the  $BE(t+i-1) / ME(t+i-1)$  ratios for size-BE/ME portfolio 5 years around portfolio formation.  $BE(t+i-1)$  and  $ME(t+i-1)$  are the book common equity and market equity, respectively, at the end of December year (t+i-1). Table (4) shows, that the Tunisian distressed firms in the high-BE/ME portfolios tend to have high BE/ME for two years before and two years after portfolio formation. Conversely, low-BE/ME firms have sustained high profitability, and the Tunisian stock market responds by persistently pricing their equity at a premium to book.

#### 5. The relationship of the size and BE/ME ratio with distress risk indicator:

Referring to the literature, we used as a measure of financial distress risk: Financial leverage and the standard deviation of earning (E) to price (P) ratio (E/P).

##### 5.1. Leverage as a measure of financial distress risk:

Financial leverage affects the risk of equity return of firms of every size, but its influence is likely to be felt more strongly among firms that are not doing well (Chan and Chen (1991)). This motivates the choice of using a financial leverage criterion to examine the riskiness of a firm. Indeed, as the book value of liabilities increases and approaches the value of assets, the default risk of the firm increases. Until, finally, the firm defaults when market value of assets is insufficient to repay the liabilities (Grosbie and Bohn (2003))<sup>7</sup>. Campbell, Hilscher and Szilagyi (2006) find that an increase in the debt ratio by one standard deviation from its mean value increases the probability of financial failure of American companies by 156% of its initial value over the period January 1963-December 2003. These previous researches motivate our study in choosing leverage as one of the risk measures of Size-BE/ME portfolios. We define financial leverage as the sum of book value of current liabilities and long term debt over market value of equity (BL/ME). Chan and Chen (1991), Chen and Zhang (1998) and Altman (1968) use this ratio for the determination of Z-score. This ratio compares the massive debt to anticipated future income flows and gives an indication of the prevailing market opinion about the faculty of firms to repay their debts in the future. It allows evaluating the future repayment capacity of the firm as assessed by the market<sup>8</sup>. We analyzed the value of financial leverage ratio for portfolios ranked by size and BE/ME ratio, five years around portfolio formation.

<sup>7</sup> A firm's leverage has the effect of magnifying its underlying asset volatility. This has the effect of increasing the risk of default. More the market value of assets is volatile, the more it tends to approach the book value of debt, greater the risk of default of the firm is. (Grosbie and Bohn(2003)).

<sup>8</sup> Campbell, Hilscher and Szilagyi (2006) find that a measure of the leverage ratio based on the market gives a better prediction of default risk than a measure based solely on book value. Indeed, measures based on the Market value (that reflect the points of view and expectations synthesized of several investors) are more sensitive to new information on the prospects of the firm.

Table (5) shows that BE/ME ratio is positively related to leverage and this relationship persists over a period of five years around the portfolio formation. This implies that value stocks (high BE/ME stocks) are more likely to encounter difficulties to meet their obligations as growth stocks (low BE/ME stocks). These results are observed for both small and big stocks. The results for the relationship between firm size and leverage are consistent with those of Chan and Chen (1991) and Chen and Zhang (1998). Small stocks have higher leverage ratio than big stocks, given that BE/ME is high (or low). This negative relationship between firm size and leverage persists two years before and two years after portfolio formation year, both for value stocks and for growth stocks, reflecting a greater exposure to financial distress risk of small firms.

## 5.2. Standard deviation of earnings-to-price ratio as a measure of risk:

Chen and Zhang (1998) used the standard deviation of earnings (E)/price (P) ratio (E/P) as a measure of risk. They consider S/H portfolio as risky (compared to B/L portfolio) because of substantial uncertainty in the future earnings accruing to the stockholder. The standard deviation of the E/P ratio has the intuitive interpretation that it is the uncertainty of next period's earnings per "dollar" invested in the stocks. In order to examine the risk facing the Tunisian Value stocks and small stocks, we used the methodology of Chen and Zhang (1998). Indeed, for each year (t+i) relative to the portfolio formation year t, we compute the standard deviation  $\sigma(E(t+i)/P(t+i-1))$  ratio by collecting the ratios  $E(t+i)/P(t+i-1)$  across time t in our sample period and calculating the time series standard deviation. We computed the portfolio  $E(t+i)/P(t+i-1)$  as the sum of earnings for year (t+i) divided by the sum of market values for year (t+i-1) of all the stocks in the portfolio. Thus  $\sigma(E/P)$  for year (t+i), is the time-series standard deviation of earnings in December (t+i) per dollar invested in December (t+i-1).

Table (6) shows that BE/ME ratio is positively related to  $\sigma(E/P)$ . It seems that Tunisian value stocks are riskier than growth stocks because they face greater uncertainty associated with future earnings than growth stocks both in small and in big stocks portfolios. S/H (B/H) portfolio has higher  $\sigma(E/P)$  than S/L (B/L) portfolios two years before and two years after portfolio formation year. Table (6) shows also a persistent negative relation between the size of the firm and the  $\sigma(E/P)$ . Given the ratio BE/ME, Tunisian small firms seem persistently associated with a relatively greater uncertainty about future profits compared to big firms.

## Conclusion

This paper, firstly examines whether the size and BE/ME effects are phenomenon proper to the developed markets or that is a general phenomenon that extends to little and emerging markets like the Tunisian stocks' market. From this investigation, we stress that over the period from July 1998 to December 2010 there are significant and strong BE/ME and size effects in the Tunisian stocks' returns. Therefore, this seems to be a general phenomenon. The secondly purpose of this paper is to contribute to the debate about the economic rationale behind these average returns anomalies. In line with rational asset pricing, Chan and Chen (1991), Fama and French (1993, 1995, and 1996) and Chen and Zhang (1998) invoked the concept of financial distress to explain these anomalous patterns in the cross-section of stock returns. The idea is that certain companies like small and high BE/ME ones have an elevated risk that they will fail to meet their financial obligations and investors charge a premium for bearing this risk. However, tests of the relation of size and BE/ME ratio with financial distress risk was limited to US and other developed markets. This paper extends the previous literature and examined whether there are cross-sectional risk characteristic differences among Tunisian value stocks and growth stocks and among small and big stocks.

To this end, we evaluated relationship of some market and accounting based measures of financial distress risk and profitability with BE/ME and size in portfolios formed on size and BE/ME ratio. Consistent with the risk-based explanation, results of this paper give evidence that the Tunisian value stocks and small stocks are riskier because they are usually firms under distress. They have persistent poor performance, higher financial leverage and face substantially uncertainty in future earnings. Results of our study have important implication for investors in the Tunisian stocks' market. We suggest that investors must tilt their portfolios in favor of characteristics such as firm's BE/ME and size. However, by tilting portfolios in favor of these characteristics investors are exposed to additional sources of risk. To further advance debate, additional tests on the robustness of the risk-based explanation of BE/ME and size effects in other emerging markets is required to deepen our understanding of the economic reasons behind the superior returns of value and small stocks.

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**Tableau (1):**

Monthly average excess returns (in percent) for portfolios formed on size and BE/ME July 1998-december 2010:

Monthly average excess returns				
Ratio BE/ME				
	H	M	L	H-L
S	3.716	1.288	1.22	2.496
B	2.248	1.004	0.11	2.138
S-B	1.468	0.284	1.11	

**Table (2)**

The 5-years evolution of Return-to-asset for size-BE/ME portfolios formed in June of year t =1998- December 2010:

	OI (t+i)/A(t+i-1)		
	i < 0	i = 0	i > 0
S/H	0.037	0.0366	0.0202
S/L	0.079	0.0791	0.062
B/H	0.041	0.0447	0.0455
B/L	0.1129	0.082	0.074

Note: For each portfolio formation year t = 1998 to 2010, the ratios are calculated for t+i, i = -2, ..., 2. The ratio for t+i is then averaged across portfolio formation year t. OI (t+i)/A(t+i-1) is the sum of Operating Income(earnings before interest and tax) for year (t+i) divided by the sums of Assets for year (t+i-1) for all firms in a portfolio that have the required data for (t+i) and for portfolio formation year t. The “i < 0” refers to the average for year i = -1, -2 before the portfolio formation, i=0 is the formation year, and “i > 0” is the average for year i=1, 2 after formation.

**Table (3):**

The 5-years evolution of Return-to-book equity for size-BE/ME portfolios formed in June of year t =1998- December 2010:

	EI (t+i)/BE(t+i-1)		
	i < 0	i = 0	i > 0
S/H	0.062	0.051	0.018
S/L	0.114	0.170	0.166
B/H	0.0756	0.089	0.114
B/L	0.179	0.185	0.171

Note: For each portfolio formation year t = 1998 to 2010, the ratios are calculated for t+i, i = -2, ..., 2. The ratio for t+i is then averaged across portfolio formation year t. EI (t+i)/BE (t+i-1) is the sum of earnings after depreciation, taxes and interest (EI) for year (t+i) divided by the sum of BE for year (t+i-1) for all firms in a portfolio that have the required data for t+i and for portfolio formation year t. The “i < 0” refers to the average for year i = -1, -2 before the portfolio formation, i=0 is the formation year, and “i > 0” is the average for year i=1, 2 after formation.

**Table (4):**

The 5-years evolution of Book-to-Market equity of size-BE/ME for size-BE/ME portfolios formed in June t = 1998- December 2010:

	BE (t+i-1)/ME(t+i-1)		
	i < 0	i = 0	i > 0
S/H	4.853	7.737	7.211
S/L	2.746	1.334	3.528
B/H	2.764	4.601	3.378
B/L	0.705	0.71	1.45



Note:  $BE(t+i-1)/ME(t+i-1)$  is the sum of BE for year  $(t+i-1)$  divided by the sum of ME for year  $(t+i-1)$  for all firms in a portfolio that have the required data for  $(t+i)$  and for portfolio formation year  $t$ .  $BE(t+i-1)$  and  $ME(t+i-1)$  are the book common equity and market equity, respectively, at the end of December of year  $(t+i-1)$ . “ $i<0$ ” refers to the average for year  $i=-1, -2$  before the portfolio formation,  $i=0$  is the formation year, and “ $i>0$ ” is the average for year  $i=1, 2$  after formation.

**Table (5):**

The 5-years evolution of Financial leverage ratio for size-BE/ME portfolios formed in June of year  $t=1998$ -December 2010:

	BL $(t+i-1)/ME(t+i-1)$		
	$i<0$	$i=0$	$i>0$
S/H	3.441	5.791	7.126
S/L	1.891	1.7930	3.491
B/H	1.894	3.242	1.998
B/L	1.080	0.657	1.016

Note:  $BL(t+i-1)/ME(t+i-1)$  is the sum of book value of total liabilities for year  $(t+i-1)$  divided by the sum of market equity for year  $(t+i-1)$  for all firms in a portfolio that have the required data for  $(t+i)$  and for portfolio formation year  $t$ . The ratios are calculated for  $(t+i)$ ,  $i=-2, \dots, 2$ . The ratio for  $(t+i)$  is then averaged across portfolio formation year  $t$ . The “ $i<0$ ” refers to the average for year  $i=-1, -2$  before the portfolio formation,  $i=0$  is the formation year, and “ $i>0$ ” is the average for year  $i=1, 2$  after formation.

**Table (6):**

Standard deviation of E/P ratio for size-BE/ME portfolios, 5 years around portfolio formation (July 1998-December 2010):

	$\sigma(E(t+i)/P(t+i-1))$		
	$i<0$	$i=0$	$i>0$
S/H	2.194	5.168	2.023
S/L	1.498	0.184	1.038
B/H	0.996	0.613	0.357
B/L	0.277	0.143	0.231

Note: For each year  $(t+i)$ , we compute  $\sigma(E(t+i)/P(t+i-1))$  by collecting the ratios  $E(t+i)/P(t+i-1)$  across time  $t$  in our sample period and calculating the time series standard deviation. The portfolio  $E(t+i)/P(t+i-1)$  is computed as the sum of earnings for year  $(t+i)$  divided by the sum of market values for year  $(t+i-1)$  for all firms in a portfolio that have the required data for  $(t+i)$  and for portfolio formation year  $t$ . The “ $i<0$ ” refers to the average for year  $i=-1, -2$  before the portfolio formation,  $i=0$  is the formation year, and “ $i>0$ ” is the average for year  $i=1, 2$  after formation.