The Changing Nature of Systematic Risk

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ABSTRACT

The paper studies the evolution of market risk over almost eighty years of data. The motivation stems from the observed downward trend in the beta of high book-to-market (BM) stocks. The cause of this decrease is identified in a change of sign in the cross-sectional link between valuation measures and beta. This fact, in turn, is explained by the changing correlation between risk loadings and the cash flow attributes of the firm. In the past, risky stocks are unprofitable companies. More recently, high beta stocks are fast growing firms. This evolution reflects the increased importance of growth for listed companies. Finally, the paper establishes that once the impact of cash flows is filtered out of BM, the value premium is halved. This result suggests that any explanation of the value anomaly should directly address the role of fundamentals.

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The motivation for this paper is well summarized by Figure 1, which presents an updated version of the main empirical result in Franzoni (2002). The graph plots estimates of market betas for a portfolio of value stocks.[1] The clear impression from the figure is that, over the course of almost eighty years, value firms have evolved from high beta to low beta stocks. Following Harvey (1989), and Ferson and Harvey (1991 and 1999), Franzoni (2002) tracks the evolution of beta using conditioning variables that capture the status of the economy. His results hint at a relation between the decrease in beta and a long term improvement in economic condition. The decrease in the beta of the value portfolio is acknowledged by a number of later studies.[2] In particular, Polk, Thompson, and Vuolteenaho (2006), while focusing on cross-sectional forecasts of the equity premium, suggest that the downward trend in beta is related to a long term fall of the risk premium on the market. Moving from this conjecture, the present paper aims at providing further insight on the determinants of the decline in the market beta of value stocks.

This motivation implies a broader focus for the analysis. Evidently, the study has to revolve around the relationship between valuation and risk. In doing that, it is crucial that the valuation model specifies firm fundamentals. Not only do fundamentals determine value through investors' expectations of future cash flows, but also they affect a firm's sensitivity to systematic risk. Hence, the univariate relationship between value and beta, which is central to understanding the evolution of risk for book-to-market (BM) portfolios, is affected by the correlation between beta and cash flows. For this reason, the paper is ultimately concerned with the interaction between the cash flow profile of a firm and its exposure to market risk.

The first step in the empirical strategy is the selection of a few company characteristics that are capable of predicting profitability and growth. Evidently, the spectrum of the variables that are considered is constrained by the long horizon of the study. The chosen predictors relate to the payout policy (dividends and share repurchases), current profitability, age, size, and analyst forecasts (which is the only variable that is not available throughout the sample). The next step is to run cross-sectional regressions of BM on beta. The goal is to observe the evolution over time in the slope on beta, which directly determines the risk loading of BM portfolios. If the time-variation in this slope is affected by the inclusion of the cash flow predictors, the immediate explanation of

[1] The series plots the estimates from five-year rolling window regressions using monthly returns on the tenth book-to-market decile portfolio. The data come from Prof. Ken French's website.

[2] Among the others: Menzly, Santos, and Veronesi (2002), Ang and Liu (2004 and 2006), Campbell and Vuolteenaho (2004), Fama and French (2005), Santos and Veronesi (2005 and 2006b), Lewellen and Nagel (2006), Polk, Thompson, and Vuolteenaho (2006).

the fact in Figure 1 lies in the changing correlation between beta and fundamentals. Then, in order to identify the most relevant determinants of betas in different periods, the focus is shifted on the relationship between risk loadings and cash flow characteristics. With the same goal, the evolution of profitability and growth of BM portfolios is also examined.

Given the failure of CAPM in accounting for the size and value premia (Fama and French (1992)), and the subsequent developments in asset pricing, one may be skeptical about the choice of the CAPM beta as an interesting measure of systematic risk. However, I believe that there are multiple reasons that make the current focus relevant. First, even the most successful multi-factor models include the market factor as a source of priced risk (see Fama and French (1993)). Second, conditional versions of the CAPM appear not to be rejected by the data (e.g. Lettau and Ludvigson (2001)). Even if one does not believe in the ability of conditional CAPM in explaining the anomalies (Daniel and Titman (2006), Lewellen and Nagel (2006), Lewellen, Nagel, and Shanken (2006)), the model still has a significant normative appeal, which explains its widespread adoption in applications. Finally, it is plausible that alternative risk factors bear correlation with the market. If that is the case, the evolution studied in this paper similarly concerns the loadings on other sources of risk.

With the twofold purpose of verifying the last conjecture and acknowledging the recent asset pricing literature, the paper devotes some space to the risk loadings from three other models (Fama and French (1993), Campbell and Vuolteenaho (2004), and Bansal, Dittmar, and Lundblad (2005)). This analysis complements the picture on the evolution of systematic risk.

While asserting the importance of the market beta as a measure of risk, this article takes no stance on either the correct asset pricing model or the explanation of the CAPM anomalies. However, given the observed relevance of fundamentals for valuation and risk, the last part of this work briefly examines the impact of the selected measures of fundamentals on the value premium. A portfolio formation procedure is defined in which, each year, the sorting variable is the residual from a cross-sectional regression of BM on cash flow predictors. Ideally, the resulting portfolios are free from expectations of future cash flows and from the correlation between risk loadings and the levels of profitability and growth. Hence, the comparison of their returns with those on standard BM portfolios should highlight the role of specific features of the cash flow profile on the value premium.

The results of the paper are easily summarized. The decline in the equity premium does not appear to be the direct source of the decrease in beta of value stocks. Instead, the fact seems to be directly related to a change in the correlation between beta and the cash flow characteristics of the firm. In the early decades of the sample, high beta firms are the unprofitable value companies. Over time, risk exposure becomes increasingly correlated with growth. As a result, fast growing low BM firms have the highest market betas. Overall, the evidence portrays a radical change in the nature of systematic risk.

In more detail, the cross-sectional regressions reveal that the decrease in the univariate link between BM and beta is largely absorbed by the inclusion of cash flow controls. This finding is explained by the change in the correlation structure between beta and fundamentals. In the early decades, beta is significantly negatively related to profitability, while growth is unimportant. This situation changes over time, as growth becomes more and more positively related to risk. The risk exposures in the other factor models display a consistent evolution. The loadings that appear to be tied to short term cash flows (that is, the loading on HML, the bad beta, and the consumption beta) are higher for value companies throughout the sample. Instead, the risk sensitivity that mostly depends on growth (the good beta) mimics the behavior of the market beta.

The paper suggests an interpretation of this evidence. The increasing importance of growth in determining sensitivity to risk can be related to the finding that listed companies have become more growth oriented across the board (Fama and French (2004)). In the past, when the cash flows of listed firms display on average short duration, systematic variation in asset prices is caused by fluctuations in the business cycle. Hence, the riskiest firms are the unprofitable value companies. Later on, as growth permeates the economy, discount rate shocks represent a large source of systematic variation. In this environment, fast growing firms have the largest exposure to market risk. A complement to this story is suggested by Fama and French's (2004) interpretation of the evidence in their paper. According to these authors, the increasing importance of growth for listed firms is related to a fall in the cost of capital, which would justify the funding of projects with more distant payoffs. Hence, for the purposes of the present study, one could conjecture that the decline in the equity premium, although not immediately related, could be the ultimate cause of the decrease in the beta of value stocks.

The last result of the paper concerns the effect of cash flow characteristics on the value premium. Once the impact of profitability and growth predictors is filtered out of the BM ratio, the value premium is no longer economically and statistically significant. This finding lends itself to two interpretations, which invoke alternative explanations of the value anomaly. First, in a rational framework, filtering cash flows out of BM could be equivalent to removing the part of priced risk that generates equilibrium returns. In this case, sorting on this residual measure of BM would not produce any spread in returns. Secondly, the variables relative to which BM is orthogonalized could capture investors' mistaken expectations of future cash flows. As in a behavioral story, once the error in expectation is controlled for, the value premium disappears. Irrespectively of the correct interpretation, this evidence suggests that identifying the feature of fundamentals that drives either risk loadings or erroneous expectations can help finding an account for the value premium.

In addition to the articles that have already been cited, the paper is related to different strands of literature. Like Cohen, Polk, and Vuolteenaho (2003), this work focuses on the cross-sectional determinants of valuation and finds that fundamentals, as opposed to discount rates, play the main role. Unlike that paper, the present study is interested in the historical evolution of the relationship between risk loadings and cash flows. In terms of the interpretational framework of the results, this paper is indebted to the empirical findings in Campbell and Vuolteenaho (2004)[3] and the theoretical models in Santos and Veronesi (2005 and 2006a), and Lettau and Wachter (2006). From these studies, I draw the distinction between the discount rate and cash flow components of beta and their link to firm fundamentals. Also crucial for the interpretation of the evidence, the articles by Fama and French (2004) and Fink, Fink, Grullon, and Weston (2005) point out the increasing importance of growth for listed companies. Finally, this paper is similar in nature to the research that points out long run trends in the stock market, such as Morck, Yeung, and Yu (2000), who find a secular decrease in the explanatory power of the market model, and Campbell, Lettau, Malkiel, and Xu (2001), who discover a long run surge in idiosyncratic volatility. Inspired by the results in Fama and French (2004), I propose a suggestive interpretation that holds these two papers and the current study together, and that is based on the long term decrease in the equity premium (Fama and French (2002)).

This work proceeds as follows. Section I lays out a simple valuation model that serves as an interpretational framework for the empirical study. Section II describes the data and defines the variables for the analysis. Section III identifies the predictors of profitability and growth. Then, these variables are used along with beta in the cross-sectional valuation regressions. Section IV directly studies the link between beta and fundamentals, and presents a discussion of the main empirical findings of the paper. Section V contains a series of robustness checks and extends the analysis to alternative measures of risk. Section VI obtains a measure of BM that is orthogonal

[3] Also relevant: Campbell and Mei (1993), Campbell, Polk, and Vuolteenaho (2005), and Koubouros, Malliaropulos, and Panopoulou (2005) .

to fundamentals. This variable is used to validate the main findings of the paper and to study the impact of cash flows on the value premium. Finally, Section VII draws the conclusions and proposes directions for future research.

I. The Link Between Beta and Book-to-Market

Polk, Thompson, and Vuolteenaho (2006) suggest a decrease in the equity premium as a possible explanation for the downward trend in the beta of the value portfolio. In the framework of a valuation model, this section first analyzes the links between the beta of value stocks and the equity premium, then it points out the other potential determinants of this decrease.

In any valuation model, the current price of an asset is the present value of future cash flows discounted at the appropriate rate, which accounts for the risk of the payoffs. If the Sharpe-Lintner CAPM is the correct asset pricing model, the risk premium is a function of the market beta of the asset. In this case, the higher the beta, the higher the discount rate, and the lower the current valuation of future cash flows relative to today's fundamentals, *ceteris paribus*. In other words, keeping everything else constant, companies with higher betas should have higher BM ratio. In this story, the equity premium magnifies the effect of beta on BM. Even if CAPM does not work, but the relevant risk factors are overall positively correlated with market risk, beta is likely to be positively linked to discount rates and negatively to valuations, again *ceteris paribus*.

The above insistence on the *ceteris paribus* condition is not casual. As it shown below, the correlation between beta and the other determinants of value, specifically the expectation of future cash flows, is central in understanding the link between beta and BM.

To develop the argument, I start from a simple reduced form where the only explicit determinant of value is beta. In particular, let firm i's BM ratio be:

$$BM_i = \gamma \cdot \beta_i + \varepsilon_i. \tag{1}$$

Equation (1) postulates a linear relationship between beta and BM.[4] The link between BM and beta depends on the parameter γ, which is positive as a consequence of the role played by beta in discounting. Notice that, given the price for beta risk is the equity premium, γ is positively related to the market risk premium. The other determinants of value, i.e. cash flow expectations

[4] While linearity can follow from a valuation model under specific assumptions, it is more useful to think of equation (1) as resulting from a linearization of a more complex formula.

and potentially omitted risk loadings, are contained in ε_i. The correlation between beta and ε_i can take any value.

Equation (1) provides a simple illustration of the determinants of the beta of BM sorted portfolios. It is evident that a portfolio of high BM stocks is composed of firms that have either high betas, or high realizations of ε_i, or both. Whether the first or the second effect prevails depends on the relative variance of the two terms in equation (1). The correlation between the two terms matters as well.

In the case where $Cov(\beta_i, \varepsilon_i) = 0$, the beta of high BM portfolios is at least as large as the beta of low BM portfolios, given that γ is positive. Moreover, the extent to which the beta of high BM stocks exceeds that of low BM stocks depends on the relative importance of the two terms in equation (1). If the cross-sectional variance of the first term is negligible relative to the variance of ε_i, then sorting on BM generates mostly a sort on cash flow expectations and omitted risk controls, rather than a sort on betas. In this case, the spread in betas between high and low BM stocks shrinks to zero. The fact that the variance of the first term depends on γ, which in turn is a positive function of the market risk premium, motivates Polk, Thompson, and Vuolteenaho's (2006) interpretation of the decrease in beta of value stocks as due to the decline in the equity premium.

Removing the assumption $Cov(\beta_i, \varepsilon_i) = 0$ discloses another possible explanation of this empirical fact. If the covariance between beta and ε_i is positive, high BM stocks have higher beta than low BM stocks, irrespectively of the relative importance of the two terms in equation (1). Instead, a negative covariance between beta and ε_i, and a predominant effect of ε_i in determining BM, causes the value portfolio to have a lower beta than the growth portfolio. Hence, time variation in the value portfolio beta can also result from time-varying correlation between beta and ε_i.

The evidence in Figure 1 allows some preliminary inference on the relevant parameter configuration in equation (1). Starting in the early eighties through the end of the sample, the beta of value stocks is below one, while the growth beta (which is not reported in the figure) is above one. Given the above the discussion, it is necessarily the case that in this period the variance of ε_i dominates in equation (1), and that the correlation between beta and ε_i is negative.

To gain more insight, it is useful to make explicit the cash flow expectations that are contained in ε_i. The Gordon (1962) dividend discount model provides a convenient framework. Omitting the time subscripts, this model expresses the time t market value of a firm (M_i) as a function of next period dividends (D_i), which are expected to grow at a constant rate G_i and are discounted at the constant expected rate of return R_i:

$$M_i = \frac{D_i}{R_i - G_i}. \tag{2}$$

By dividing each side by the book value (B_i) and inverting the ratios, one obtains an expression for the BM ratio as a function of expected return, growth, and the dividend-to-book ratio d_i:

$$\frac{B_i}{M_i} = \frac{1}{d_i}\left(R_i - G_i\right). \tag{3}$$

Equation (3) says that the BM ratio depends positively on the discount rate, and negatively on expected growth and d_i. In turn, d_i can be expressed as the product of the return on equity (ROE) and the dividend payout ratio:

$$d_i = \frac{E_i}{B_i}\frac{D_i}{E_i}, \tag{4}$$

where E_i stands for earnings. So, BM is also a negative function of profitability and dividend payout.

A first order Taylor approximation of equation (3) around the cross-sectional averages of R_i, G_i, and d_i provides a linear expression for the BM ratio:

$$\frac{B_i}{M_i} \approx \kappa + aR_i - a\left(G_i + \kappa d_i\right), \tag{5}$$

where κ and a are positive linearization coefficients.[5] Let $Y_i = G_i + \kappa d_i$ capture the overall expectation of profitability and growth and label it "cash flow expectations".

For the sake of focusing on market risk, I now introduce the assumption that the Sharpe-Lintner CAPM is the relevant asset pricing model. The possibility that other risk measures determine the discount rate is implicitly acknowledged in the following empirical analysis through the residuals of the cross-sectional valuation regressions. Moreover, Section V explicitly considers the risk loadings from alternative asset pricing models.

Replacing the CAPM's prediction for the firm's expected return in equation 5, yields:

$$\frac{B_i}{M_i} \approx \gamma_0 + \gamma_1\beta_i + \gamma_2 Y_i, \tag{6}$$

where $\gamma_0 = \kappa + aR_f$, $\gamma_1 = aE\left(R_M - R_f\right)$, $\gamma_2 = -a$, and $E\left(R_M - R_f\right)$ is the equity premium. Notice that γ_1 corresponds to γ in equation (1) and $\gamma_0 + \gamma_2 Y_i$ corresponds to ε_i. Equation (6) makes explicit the intuition that BM and beta are positively related through the equity premium.

Assuming $Cov(\beta_i, \varepsilon_i) = 0$ in equation (1) amounts to excluding a correlation between beta and cash flow expectations. Not only is this assumption inconsistent with the value beta being

[5] Their expressions are: $\kappa = \frac{\bar{R}-\bar{G}}{\bar{d}}$, and $a = \frac{1}{\bar{d}}$, where $\bar{R}$, $\bar{G}$, and $\bar{d}$ represent cross-sectional averages.

below one in the late sample, but it also contradicts some recent developments in the theoretical literature that are discussed later in the paper (Santos and Veronesi (2005 and 2006a), and Lettau and Wachter (2006), among the others).[6]

Therefore, it is more appropriate to take explicitly into account the correlation between beta and cash flow expectations. This correlation implies that a simple regression of BM on beta, like the one in equation (1), is affected by the omitted variable bias. Specifically, the expectation of the OLS estimate of γ from a univariate regression of BM on beta is:

$$E(\hat{\gamma}) = \gamma_1 + \delta\gamma_2, \tag{7}$$

where δ is the coefficient in the linear projection of Y on β. Given that γ_2 is negative, the sign of the bias is the opposite of the sign of the correlation between beta and cash flow expectations.

The expression in equation (7) captures the total derivative (as opposed to the partial one) of BM with respect to beta. This derivative is what matters in determining the betas of BM sorted portfolios. If $\hat{\gamma}$ is positive in the sample, then high BM stocks have high betas, and vice versa.

Equation (7) also clarifies the determinants of the evolution of the value portfolio beta. The total correlation between BM and beta and, therefore, the beta of high BM stocks can decrease because of a decline in the equity premium that causes γ_1 to go down. In addition, it can drop if the bias $\delta\gamma_2$ falls. For example, given that γ_2 is negative, an increase in δ and, to the limit, a change of sign from negative to positive can account for the behavior of the value portfolio beta. Concretely, the evolution of firms with low expected cash flows from being high beta stocks to being low beta stocks represents an explanation for the decline in the beta of value stocks that is different from the decrease in the equity premium.

As said above, the fact that since the early eighties the beta of value stocks is below one implies a negative correlation between beta and ε_i in equation (1). Therefore, it is likely to imply a positive correlation between beta and cash flow expectations Y_i over that period ($\delta > 0$). An open question is whether the evolution of beta before the eighties can be characterized as a decline in the equity premium. This event, along with the positive correlation between risk loadings and cash flow expectations, would cause the value portfolio beta to drop below one. This is the story suggested

[6]Even simple anecdotal evidence suggests the existence of a relation between beta and cash flow expectations. During the "Tech Boom", the very high betas of internet firms went hand in hand with huge forecasts of long term growth. For example, Yahoo! in December of 1999 had a beta of 3.5 (computed over the previous forty-four months) and the median forecast of long term expected growth was 50% annually. In the same period, the beta of Amazon.com was 2.5 and the median forecast of growth for the next five years was 60% annually.

by Polk, Thompson, and Vuolteenaho (2006). The other possibility, which I have just put forward, is that the decrease in the beta of value stocks is due to a progressive increase in the correlation between beta and Y_i. The following empirical analysis tries to disentangle the two explanations.

II. Data and Variable Definitions

The data for the empirical analysis result from the intersection of different data sets. Stock returns, dividends, and shares outstanding between July 1926 and December 2005 come from the CRSP monthly stock file. Book value comes from Compustat (between 1950 and 2005) and from Moody's Industrial Manuals (1926-2000), as collected by Davis, Fama, and French (2000). IBES provides analyst forecasts of long term growth between 1981 and 2005. The three Fama and French (1993) factors have been obtained from Prof. Ken French's website. The factors for computing the "bad beta" and the "good beta" (Campbell and Vuolteenaho (2004)) are available on Tuomo Vuolteenaho's website. Finally, consumption data is taken from the NIPA tables at the Bureau of Economic Analysis.

The main measure of valuation in the paper is book-to-market. As in Fama and French (1993), Book value is the stockholders's book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholder's equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order). Then, a firm's BM ratio is computed by dividing book value at the end of fiscal year t by market equity in December of year t. Firms with BM below 0.01 and above 100 are not considered for the analysis. BM is available between 1926 and 2005.

Other measures of valuation that are considered are the dividend yield (D/P) and the earnings yield (E/P). To this purpose, and for constructing some of the explanatory variables, one needs to obtain measures of dividends and earnings from the beginning of the sample. Annual dividends are computed by summing monthly dividends from CRSP between January and December. This variable is available between 1927 and 2005. Given the unavailability of Compustat data in the early sample, to obtain a continuous series for earnings, one needs to use the clean surplus identity. As in Cohen, Polk, and Vuolteenaho (2003), clean surplus earnings are computed adjusting for equity offerings:

$$E_t = \left[\frac{(1+R_t)M_{t-1} - D_t}{M_t}\right] \times (B_t - B_{t-1} + D_t), \tag{8}$$

where R_t is the stock return in year t. This earnings measure is available between 1927 and 2005.

Return on equity (ROE) provides a measure of profitability that is used as explanatory variable. ROE is defined as the ratio of earnings in year t on book value in year $t-1$. It is available between 1927 and 2005.

Given the increasing role of share repurchases as a substitute for dividends, the explanatory variables include this alternative measure of payout. Annual share repurchases are the sum of monthly repurchases between January and December. Monthly repurchases are computed using the decrease in shares outstanding in the month times the stock price at the end of the month, as in Stephens and Weisbach (1998), Jagannathan, Stephens, and Weisbach (2000), and Bansal, Dittmar, and Lundblad (2005). Each year, annual repurchases are winsorized at their ninety-ninth percentile. Annual repurchases are available between 1927 and 2005.

Annual dividends and share repurchases are then expressed as a fraction of firm size by dividing them by book value in year t. The choice of book value as a measure of size, is dictated by data availability and by the need to rule out price variables from the explanatory variables. To avoid possible measurement errors, firms with dividend and repurchases ratios above one are excluded from the analysis.

When used in the empirical analysis, ROE, the dividend ratio, and repurchases ratio are averaged over the three years t, $t-1$, and $t-2$. This implies a selection criteria according to which a firm needs to have at least three years of available data. Hence, the sample effectively starts in 1929.

The empirical specification includes firm age among the variables that capture cash flow expectations. A firm's age in year t is equal to the number of years it has appeared in CRSP between 1926 and year t, as in Pastor and Veronesi (2003). In particular, consistent with Pastor and Veronesi's specification, I transform firm's age by taking the negative of one over one plus age. This transformation does not significantly affect the results.[7]

To be part of the sample in year t, a firm needs to have a valid observation for the median forecast of long term growth from IBES. The annual forecast of long term earnings growth for a firm is defined to be the average of the median forecasts from IBES over the months between January and December. Using the forecast in December as annual forecast would not significantly

[7] Fink, Fink, Grullon, and Weston (2005) show that firm age at the time of listing has trended down over the sample. This effect would invalidate my proxy for age, if it were used in a time-series analysis. In that case, these authors' definition of age as number of years since foundation or incorporation would be more appropriate. However, given that age is used in cross-sectional regressions, under the assumption that the measurement error is constant across firms, my definition of this variable is still valid.

change the results. Each year, annual forecasts are winsorized at their ninety-ninth percentile. This variable is only available between 1981 and 2005. Hence, the selection criterion only applies to these years.

For most of the paper the relevant risk loading is the market beta. For each firm, the market beta in year t is computed in December using monthly returns on at least twenty-four and at most sixty months of prior data. The market index is the CRSP value-weighted portfolio.

Section V considers alternative risk loadings. Like the market beta, the year t loadings on the three Fama and French (1993) factors and the year t bad beta and good beta (Campbell and Vuolteenaho (2004)) are obtained in December of year t by regressing the stock excess return on at least two and at most five years of returns for the relevant factors. Each year, I exclude outliers in the distribution of market beta and the other risk loadings by dropping the observations that are five standard deviations away from the mean.

Finally, the consumption beta is computed at stock level adapting the procedure in Bansal, Dittmar, and Lundblad (2005). These authors provide three different estimates of consumption betas. For computational ease, and given this parameter provides the most robust results in that paper, the choice falls on the slope in the regression of dividend growth on consumption growth.[8] As in Bansal, Dittmar, and Lundblad (2005), I let the series of consumption betas start in 1967.

Table I provides summary statistics on the main variables for the firms that satisfy these selection criteria. The average annual number of firms is about 1326 in seventy-seven years of data.

III. Cross-Sectional Valuation

This section explores the evolution of the cross-sectional link between firm value and market risk. As suggested in Section I, a full characterization of this relationship must take into account the the link between valuation and cash flow expectations. Given that beta and cash flow expectations are correlated, omitting this link would provide a biased estimate of the effect of beta on BM. To this purpose, I first define a set of significant predictors of future profitability and growth. Then, these variables are used along with beta to explain the cross-sectional dispersion in valuations.

Before examining the evidence in detail, it is useful to specify that the cross-sectional analysis in this section takes the individual firms as observational unit. The use of firm level data, rather than portfolios, increases significantly the number of available observations and the power of the

[8]Specifically, I compute the equivalent at firm level of the parameter γ_i in equation (7) in Bansal, Dittmar, and Lundblad (2005).

tests. However, the regressors are likely to be measured with error, which instead decreases the power of the tests. For this reason, in Section V, I replicate the tests by aggregating firms into portfolios. This alternative approach confirms the qualitative and quantitative implications of the results.

The regressions are run at annual frequency. CRSP data would allow a higher frequency for market capitalization, dividends, and risk loadings, but book value and earnings are available only once a year. Moreover, the seasonalities in dividends require taking a moving average of the series. Hence, even in the case of dividends there is only one non-overlapping observation per year, which motivates the annual frequency.

A. Predicting Future Cash Flows

As it appears from equation (6), the BM ratio is a negative function of Y_i. This variable is positively related to both expectations of future profitability and expectations of future growth in cash flows. Hence, a specification of investors' cash flow expectations needs to include variables that predict both profits and growth and are observable at time t.

In defining these predictors, I mostly follow existing literature. Four of these variables come from Fama and French (1999) and Polk, Thompson, and Vuolteenaho (2006). The first one is the ratio of dividends to book value (Divbook). This predictor is motivated by Lintner's (1956) original observation that a firm targets its dividends to the permanent component in earnings. As explained in Section II, I take a three year trailing moving average of this variable to underweight temporary variations in dividends. Secondly, to capture non-linearities in the relationship between expected profitability and dividends, these authors include a dummy variable for dividend non-payers. I follow them and define the variable Zdiv, which equals one for firms that do not pay dividends in calendar year t, and zero otherwise. The third variable is a three year trailing moving average of the return on equity (ROE), which captures long term profitability. The fourth variable is a loss dummy (Loss). The motivation is that firms that lose money typically continue to do so in the future. More and more firms use share repurchases as a payout instrument that is alternative and sometimes complementary to dividends. Corporate managers view repurchases as a flexible tool which can be adjusted to expected cyclical variations in their cash flows (Jagannathan, Stephens, and Weisbach (2000), Grullon and Michaely (2002), and Brav, Graham, Harvey, and Michaely (2005)). Given these considerations, I also include a three year trailing moving average of the ratio of annual repurchases to book value among the cash flow predictors (Repbook).

Pastor and Veronesi (2003 and 2006) show that firm age is related to valuation. In their learning model, the convexity of the price function with respect to expected growth causes the uncertainty surrounding future cash flows to boost valuations. Given that the learning process has lasted longer for older firms, the uncertainty level is lower for firms that have existed longer. So, firm age is inversely related to value. Moreover, casual observation suggests that younger firms grow faster. This effect would also make age inversely related to expected growth and valuation. Both arguments motivate firm age as a variable that describes investors' cash flow expectations. Similar reasons suggest the inclusion of firm size among the cash flow predictors. I measure size as the logarithm of book value in year t (Book). Expressing size with an accounting variable, rather than through market capitalization, avoids the tautological inclusion of price variables on the righthand side of regressions whose lefthand side variable is market value.

Finally, analyst forecasts of long term growth provide a direct measure of growth expectations. Although the existing evidence suggests that analysts are on average over-optimistic about future growth (see, for example, Abarbanell (1991)), it is still the case that their forecasts are significantly related to growth. Hence, I include the average of the median forecast of long term growth in year t (Anfor) among the predictors. Unfortunately, this variable is only available since 1981.

Before proceeding, it is worth discussing some other variables that could act as cash flow predictors and are not included in the results that I present. For example, Fama and French (1998) use R&D, capital expenditures, and interest expense in year t to explain valuations. These variables are not available for the whole sample, but only since 1950, when Compustat coverage begins. Results that I do not present to save space show that these regressors contribute to explain valuations. However, their marginal impact in capturing the bias in equation (7), which is the main focus of the paper, is negligible. Hence, I opt for their exclusion. Moreover, Fama and French (1998) and Pastor and Veronesi (2003) use future realized earnings to capture today's cash flow expectations. Again, the inclusion of these variables would not significantly impact the main result. Instead, because of the use of future information, it would make it impossible to construct a feasible trading strategy like the one in Section VI.

Next, I consider how the selected variables predict future firm profitability and growth at different horizons. Future profitability is measured with ROE in the years $t+1$, $t+3$, and $t+5$. Growth in earnings is computed between years t and $t+i$, with $i = 1, 3, 5$. Firms with negative earnings in year t are excluded from the analysis and firms that disappear after year t are assigned a growth rate of -100%. Table II reports the estimates from Fama and MacBeth (1973) multivariate regressions at annual frequency of future profitability and growth on the seven predictors. The results are given for the whole sample and three subsamples, which cover relevant intervals in the evolution of the beta of value stocks.[9] Although I will omit it in the next discussion, one has to remember that the sign and significance of each variable has a *ceteris paribus* interpretation, given that the slopes result from multivariate regressions.

The dividend ratio (Divbook) is a significantly positive predictor of future profitability at the three horizons and in all the subsamples. On the contrary, there is no significant relationship between Divbook and growth. This result is consistent with the conjecture that firms target dividends to the permanent component of earnings, and denotes Divbook as variable that captures profitability.

The dummy variable Zdiv captures non linearities at the level of zero dividends. In the first and third sample, there is some significant evidence of lower ROE in year $t + 1$ for dividend non-payers, but this evidence is reversed in the second sample. Instead, zero dividends are consistently and significantly related to higher future growth at all horizons. This result lends itself to two interpretations. First, firms that do not pay dividends may be temporarily financially distressed and their condition mean-reverts in the future. Secondly, zero dividends may signal a firm that is funding future growth with internal finance.

Like dividends, share repurchases are positively related to profitability, but only in the latest sample. Unlike dividends, repurchases are a significant predictor of future growth, suggesting that this form of payout is chosen by the most dynamic firms.

Firms with negative earnings in year t, as measured by the Loss dummy, tend to lose money the next year as well. This effect wears out with the horizon and, in the second subsample, they become profitable after three years. Instead, making a loss significantly reduces future growth at all horizons and in all the samples. Throughout the sample period, the predictive power of the Loss dummy for growth is the strongest among the variables that are considered.

High ROE in the current year significantly predicts high profitability in the next five years and the effect peters out with the horizon. However, high profits in year t predict lower future growth at all horizons. This result is consistent with the evidence of a mean reverting process for earnings (e.g. Fama and French (1999)).

There is a negative relationship between firm age and future ROE, which becomes more sig-

[9]The first sample (1929-1953) covers the first major decrease observed in Figure 1. The second sample (1954-1980) coincides with a time of moderate decline in beta. The third sample (1981-2005) spans the last major drop in beta and coincides with the period of availability of analyst forecasts.

nificant at longer horizons. Also, older firms grow less in the future than younger firms. While present in all subsamples, this effect is mostly significant in the second sample and, in the last sample, when analyst forecasts are controlled for, it is only significant at the five year horizon. The predictive ability of firm size, as measured by book value, is comparable to that of age both in sign and significance. Larger size coincides with lower future ROE and lower future earnings growth.

Next, I consider the predictive power of analyst forecasts since 1981, when they become available. It appears that analyst forecasts of long run growth are strongly positively related to future profitability up to the three year horizon. As expected, analysts do predict future growth at any horizon. Inconsistent with a simple notion of rational forecasts, the other regressors, which are observable at the time the forecast is made, are still significant predictors of growth. This result is not new in the vast literature that studies analyst forecasts, and it has even been justified in a rational framework (see, for example, Lim (2001)).

Finally, one can assess the overall predictive power of the regressions by looking at the average R^2 (last column in Table II). In the whole sample, the highest R^2 (about 12%) is achieved in the regression for ROE in year $t+1$. Overall, the maximum forecasting power (about 16%) is attained in the first sample by the model for ROE in year $t+1$. Concerning growth, the regressors capture at most 7% of the variance, again in the early sample. In general, one observes that profitability and growth have become progressively more unpredictable, at least on the basis of the variables that are considered here. However, in spite of the relatively low predictability displayed in these regressions, these variables have a by far larger explanatory power for valuation ratios, as it is shown next.

B. Explaining the cross-section of BM ratios

Before examining the results from the full specification of the valuation model in equation (6), I focus on the univariate relationship between BM and beta by estimating the cross-sectional specification in equation (1) for every year in the sample. The purpose is twofold. First, I would like to give empirical content to the statement that the decline in the value portfolio beta is related to the decrease in the cross-sectional link between BM and beta, which is given in equation (7). Secondly, from the residuals and R^2 of these regressions one derives preliminary evidence on the relative importance of beta and cash flow expectations in the cross-section of valuations.

Figure 2 plots the series of estimated slopes, residual volatilities, and R^2. The behavior of the slope $\hat{\gamma}$ (thick solid line) confirms the theoretical intuition. As expected, the decrease in the beta of value stocks follows closely from the declining cross sectional link between BM and beta. Notice, for example, that the period in the eighties when beta falls below one (see Figure 1) is anticipated by $\hat{\gamma}$ decreasing below zero.[10] Perhaps more surprising, the series of estimated residual volatilities (thin solid line in Figure 2) tracks closely the estimated slopes. This finding clearly suggests that the omitted variable bias in equation (7) is important. The time variation in $\hat{\gamma}$ largely reflects variation in the volatility of a variable that is excluded from the regression and that is, therefore, partly captured by the residuals and partly by the included variable. The evidence from the R^2 points in the same direction (dashed line in Figure 2, plotted on the right axis). Even if beta absorbs part of the explanatory power of the omitted variables, the R^2 of the univariate regressions is never very high. It peaks at about 14% in 1943 and it averages around 3% over the whole sample. Furthermore, the explanatory power is higher in the first part of the sample than in the second. The multivariate regression results clarify that even the highest R^2 (in the early sample) depends on the correlation with the omitted cash flow predictors.

The univariate regressions show that the decrease in beta of value stocks is the reflection of a weakening link between valuation and beta. They also suggest that the variables that are omitted from the regressions are likely to play an important role in this decline. Then, a full characterization of the relationship between BM and beta requires that cash flow expectations are fully taken into account, as in equation (6). The slope on beta in a multivariate regression that includes cash flow predictors is less subject to the omitted variable bias. Hence, one can figure out the respective contributions of the equity premium and the correlation between beta and cash flow expectations in determining the evolution of the value portfolio beta.

Before using BM as dependent variable in the next regressions, I do a logarithmic transformation. The motivation for taking logs is twofold. First, the cross-sectional spread in BM ratios is related to the overall market valuation. The exponential increase in the market level over some periods coincides with an exponential decrease in the cross-sectional spread in BM ratios. This decline affects the scale of the cross-sectional slopes, as it is apparent for the series $\hat{\gamma}$ in Figure 2. Taking the logarithm of the dependent variable makes the graphs of the time series of these coefficients more readable. Secondly, even a simple valuation model, like the one in equation (3), suggests that the discount rate and the expectation of future cash flows interact non-linearly in the functional form for the level of BM. If this is the case, taking the logarithm separates one effect

[10]The fact that the series $\hat{\gamma}$ anticipates the series of the value portfolio beta is likely due to the fact that latter series is estimated using five-year rolling windows. Hence, beta reflects the average value of the cross-sectional slope over the previous five years.

from the other and makes the linear regression closer to being correctly specified.[11] However, it is reassuring that the results are similar without the logarithmic transformation. As a reference, Figure 3 reports the slope on beta from a univariate regression of the log of BM on beta (thin solid line). Compared to the series in Figure 2 (thick solid line), the downward trend is still present, but the logarithmic transformation of the dependent variable has removed the differences in scale over the sample.

Figure 3 provides a graphical summary of the main result of this section. The thick solid line depicts the slope on beta from the multivariate regression that includes all the cash flow predictors that have been described above (Divbook, Zdiv, Rebbook, Loss, ROE, Age, Book, and Anfor after 1980). The series of the multivariate slope is remarkably flatter than the univariate estimate (thin solid line). The visual impression is that the multivariate slope comes closer to approximating a mean-reverting process than the univariate slope. The dashed line represents the slope on beta from multivariate regressions that do not include analyst forecasts when they become available after 1980. The comparison with the thick solid line suggests that analyst forecasts play a major role in capturing cash flow expectations that are cross-sectionally correlated with beta. One can conjecture that a larger chunk of the omitted variable bias could have been filtered out, if such a direct measure of expectations had been available even earlier in the sample. Overall, the figure makes an important statement that can be interpreted in the framework of equation (7). A large part of the decrease in the total correlation between BM and beta comes from the evolution of the correlation between beta and fundamentals Y_i (which in turn are negatively related to BM). Early on in the sample, this correlation is strongly negative. Over time, it increases and eventually becomes positive, as I show later. On the other hand, the lack of an apparent trend in the multivariate slope suggests that a decrease in the equity premium does not play an important role in the downward trend in beta.

The estimates in Table III provide a detailed comparison of the importance of risk loadings and cash flow expectations in valuation. The table reports results from Fama and MacBeth (1973) regressions of the log of BM on beta and cash flow predictors. The estimates are time-series averages of the cross-sectional slopes. The t-statistics are computed using the standard error of

[11] Even the linearization of BM in equation (5) would not separate the discount rate from cash flow expectations. In fact, the coefficient a depends on the average cash flow expectation (see footnote 5). In periods when investors are optimistic about the economy, the coefficient a is low. In a linear regression of the level of BM on beta and cash flow expectations, this effect could be misinterpreted as a decline in the equity premium. The opposite is true, when investors are pessimistic about future cash flows.

the time-series mean. The average R^2 from these regressions is also reported. Finally, for each multivariate specification, the table provides the average share of the cross-sectional variance of the dependent variable that is explained by its covariance with beta times its estimated slope (Beta Share of Variance, BSV). This coefficient captures the fraction of the cross-sectional variation in BM ratios that is due to variation in beta above and beyond its common variation with cash flow expectations.[12]

The evidence from the whole sample (1929-2005), while concealing the time variation in the estimated slopes, allows the assessment of the long run importance of market risk for valuation. The slope from the univariate regression in the first row is positive and significant. This result, which is apparently consistent with a positive price for beta risk, hides a non stationary behavior of the series of estimated slopes, which is observed in Figure 3 (thin solid line). Once the cash flow predictors that are based on dividends are included in the regression, as in the second row of the table, the slope on beta turns significantly negative. This result implies that on average firms that pay more dividends bear less market risk. Also, given that dividends are related to the permanent component of earnings, the finding suggests that persistently profitable firms have lower betas. Including share repurchases (third row) does not alter the slope on beta. Although significant, the sets of cash flow predictors related to current profitability (ROE and Loss) do not sensibly impact the slope on beta. There is negative correlation between beta and the size variables that causes a slight increase in the slope on beta once they are controlled for, as in the fifth and sixth rows relative to the first and second rows. In the sixth row, where all the cash flow predictors but analyst forecasts are included, the coefficient on beta is negative and significant. Given that the sign of this estimate is inconsistent with the theoretical role of beta in discounting, the finding suggests that beta is still proxying for some omitted variable. The last specification includes also analyst forecast starting in 1981. In this case, the estimated coefficient for beta is not significantly different from zero at the 5% level. This evidence suggests that analyst forecasts capture at least

[12]The intuition behind the BSV coefficient replicates in the cross-section the idea in Cochrane's (1992) time series decomposition of returns into cash flow news and expected return news. Concretely, each year I compute the covariance between the log of BM and beta times its estimated slope, and divide it by the cross-sectional variance of the log of BM. These annual coefficients are averaged over the relevant sample to obtain BSV. This index also represents the component of the R^2 that is due to the explanatory power of beta. Conversely, the difference between R^2 and BSV represents the fraction of the variance of BM that is due to variation in cash flow expectations exceeding their covariance with beta. The possibility of this comparison motivates the decision to report the standard R^2 rather than the adjusted one

part of the omitted effect in the previous specification. In addition, the apparent stationarity of the series of estimated slopes in this specification (see the thick solid line in Figure 3) allows the interpretation of the reported slope as an estimate of the long run mean of the effect of beta on valuation. With the caveat that other correlated variables may have been left out, this estimate implies that the long run impact of market risk on valuation is not different from zero.

The analysis of the (unadjusted) R^2 reinforces these conclusions. While the variance in BM that is explained by the univariate model is about 6%, the richer specifications in Table III tell a different story. In particular, the BSV coefficient is never higher than 3% when the dividend variables are in the regressions. Besides this explanatory power is associated with a negative slope for beta, which is inconsistent with the theoretical prediction. Instead, the other variables capture a significantly more important share of variance. In the last specification, the R^2 is about 39%, and the part due to beta is only 2%. It is remarkable that the explanatory power of the cash flow predictors for the cross-section of valuations is so high, in spite of the lower predictive power for profitability and growth that is observed in Table II. Overall, among the cash flow controls the most significant are the dividend ratio and analyst forecasts. These variables are also the ones that mostly absorb the omitted variable bias in the coefficient on beta. The primary role played by dividends in forecasting future cash flows is consistent with the evidence in Fama and French (1998).

The results by subsamples in Table III reveal the time-series variation in the slope on beta that was already apparent in Figure 3. The univariate regressions show a large decrease in the effect of beta on valuations from 0.58 in the early sample (1929-1953) down to -0.21 in the late sample (1981-2005). Including all the available controls absorbs a significant chunk of this change and makes the coefficients on beta closer to zero in both the early and the late sample. This result motivates the interpretation of the decrease in the effect of beta on valuation as a time varying omitted variable bias as opposed to a decline in the equity premium. The fact that the coefficient remains negative in the late sample, even when all controls are included, further supports this interpretation, and suggests that some correlated omitted variable is still biasing the estimates. The analysis by subsamples confirms the prominent role of the dividend ratio and analyst forecasts among the cash flow predictors. In addition, share repurchases become strongly significant in the late sample, consistent with their increased importance as a form of payout.

The omitted variable bias in equation (7) is a function of the vector of regression coefficients δ, which captures the projection of the cash flow predictors Y_i on beta. Hence, in order to better understand what caused the evolution of the bias in the univariate specification from positive to negative, one needs to look at the correlation between beta and the cash flow variables. Table IV reports direct estimates of the coefficients in δ. It is interesting to observe the change in the magnitude and signs of these coefficients over time. For example, the dividend ratio (Divbook) predicts future profitability. Table IV suggests that firms that pay more dividends, and are therefore expected to be more profitable, bear less market risk. This relationship, however, has become weaker over time, suggesting that profitability has grown relatively less important as a determinant of market risk. Similar inference can be drawn from the variable ROE, whose projection on beta changes from negative to positive. The dummy variable for dividend non-payers is mostly informative on the evolution of systematic risk. Its relationship with beta is positive throughout. However, this uniformity of sign conceals a development that is, instead, revealed by the change of sign of the effect of Zdiv on BM in Table III. This evolution suggests that in the past dividend non-payers are risky firms, because of their characteristic of being unprofitable. This is testified by the positive link between Zdiv and BM in the early sample. More recently, instead, companies that do not pay dividends are risky because of their high growth potential, which is revealed by the negative coefficient on Zdiv in the two later subsamples in Table III. Finally, Table IV points out that, in the recent subsample, a firm with high analyst forecasts of growth is relatively more risky. Overall, the picture that emerges is one where in the early sample high betas are associated with low or negative profits, whereas in the later years high betas are mostly typical of firms with high expected growth.

So far, the interpretation of the success of the controls in partly absorbing the bias in the slope on beta has faithfully adhered to the framework of equations (6) and (7). That is to say, fundamentals play the dominant role in valuation, and the estimation of the effect of beta is marred by the correlation between beta and cash flows. This explanation is consistent with the finding in Cohen, Polk, and Vuolteenaho (2003) that cash flow news are by far more important than expected return news in determining the cross-section of valuations. Another plausible view is that these regressors partly proxy for omitted risk loadings, which in turn determine valuations.[13] According to this explanation, the omitted risk measure would be positively correlated with beta in the first decades of the sample, and negatively correlated later on. This story is consistent with the evidence that CAPM works well in the first part of the sample, while in the second part there is an inverse

[13] Also, one could argue that the measurement error in betas causes fundamentals to proxy for risk better than beta. I address the issue of measurement error in Section V by running the regressions at portfolio level.

relationship between beta and average returns. Also supportive of this interpretation, the results in Section V suggest that successful measures of priced risk, such as the loading on the HML factor (Fama and French (1993)), the bad beta (Campbell and Vuolteenaho (2004)), and the consumption beta (Bansal, Dittmar, and Lundblad (2005) have opposite behavior relative to the market beta in their correlation with fundamentals.

In the end, irrespectively of what interpretation one provides for the role of the cash flow variables, the inference concerning that part of systematic risk that is captured by beta coincides. Market risk is of minor importance for valuation in the second part of the sample. In addition, there is significant evidence that cash flow variables drive beta out in the early sample as well. Moreover, it emerges that the decline in the equity premium is not the main source of the change in the link between beta and valuations. Its cause has to be searched in the evolution of market risk from a characteristic of unprofitable firms to an attribute of firms with high expected growth. The next section further investigates this finding.

IV. Beta and Fundamentals

The previous analysis has pointed out that the link between beta and valuation has changed as a result of time-varying correlation between risk loadings and cash flow predictors. This section directly studies the relationship between beta, on the one hand, and profitability and growth, on the other. Then, it relates the results of this analysis to the recent evidence on the changing characteristics of listed firms.

A. The Change in the Cash Flow Determinants of Beta

Table V reports the estimates from Fama and MacBeth (1973) univariate regressions of security beta on either profitability or growth at firm level. I use different leads and lags of ROE, and compute growth over several horizons before and after year t.

The evidence from the whole sample highlights a negative relationship between beta and profitability, which is significant when using the leads of ROE. Hence, the market seems to operate in a forward looking manner by reflecting the weakness of future cash flows into the riskiness of current returns. Higher growth implies higher betas, but only when considering growth up to year t. Future growth is not significantly related to beta. This finding is apparently not supportive of the theoretical results that postulate a positive relationship between beta and expected future growth (e.g. Santos and Veronesi (2005 and 2006a), Lettau and Wachter (2006)). However, the scope of this result should not be overemphasized for a number of reasons. First, the estimated betas could contain stale information relative to the cash flow growth that they should reflect, as they are computed on returns that can be as old as five years before December of year t. In this sense, the correlation between betas and past growth is consistent with the theoretical results. Secondly, Table IV reports a significant link between analysts' expected growth and betas. Hence, although potentially biased, there exists a direct measure of expected growth that is positively related to beta, as suggested by the theory. Finally, given that low BM portfolios contain high growing firms and the opposite is true for high BM portfolios (see below), there is indeed positive correlation between beta and future growth for BM sorted portfolios. Hence, the relationship between beta and growth at firm level is perhaps non-linear, or it is affected by measurement error.

The analysis by subsamples in Table V is more informative. The negative relationship between profitability and beta at all leads and lags is only present in the first subsample. Later on, beta is positively and significantly related to past profitability, while the link to future profitability is negative. This evidence suggests two considerations. First, as a result of increased competition, it is possible that the process for earnings has become more and more mean reverting, so that currently profitable firms are future losers. Secondly, future profitability appears to be a significant determinant of betas only in the early sample. Concerning growth, the picture is reversed. Growth is not significantly related to betas in the early sample. Instead, firms that recently experienced high growth are significantly more risky in the two later samples. Overall, the results in Table V confirm the evidence from the previous section. While the exposure to market risk is initially determined by profitability it has progressively become more dependent on growth.

Keeping in mind that value stocks start with high betas in the early sample and end up having low risk loadings, one can draw similar inference by examining the distribution of profitability and growth for BM portfolios. Tables VI and VII report leads and lags of ROE and growth for ten BM portfolios. The portfolios are formed every year based on the BM distribution in December. Where possible, the firms are tracked for five years before and after portfolio formation. The ROE for the portfolio is the average of the ROE's of the individual firms. Portfolio growth is computed by first averaging real earnings across the firms in the portfolio and over the years in the relevant sample. Then, average earnings are used to compute the growth rates. This procedure circumvents the problem of computing growth rates for firms with negative earnings. Survivorship bias can represent an issue in these tables, especially in the late sample, when the survival rate falls considerably (see Fama and French (2004)). For this reason, I take these results as secondary evidence supporting the conclusions of the previous analysis. Moreover, I briefly discuss the findings of alternative procedures that point in the same direction.

The analysis of portfolio profitability in Table VI highlights a known pattern. Value portfolios tend to be composed of relatively less profitable firms than growth portfolios. This fact characterizes low BM firms as distressed companies, or "fallen angels", consistent with the findings in Lakonishok, Shleifer, and Vishny (1994) and Fama and French (1995). The evolution over the subsamples, however, suggests that the spread in profitability between low and high BM firms before portfolio formation has shrunk over time. In particular, in the early subsample, value firms are persistently less profitable three and five years before portfolio formation. Instead, in the later samples, the spread in past ROE is not so pronounced. Similarly, there is some evidence that the spread in future ROE (at the three and five year horizons) has decreased over time. Survivorship bias is certainly a concern for the estimates in Table VI, especially in the late sample. However, when I compute the portfolio ROE using a conservative procedure that corrects for the bias after portfolio formation by imputing a ROE of -1 to the firms that disappear from the sample, the pattern in Table VI is replicated (results not reported). This table confirms that high beta stocks are initially identifiable with persistently unprofitable firms, but this link gradually disappears over time.

Earnings growth in Table VII reveals that another development took place in this period. In the whole sample, low BM stocks display higher growth rates both before and after portfolio formation, which justifies their denomination as growth stocks. However, the evidence in the subsamples provides a different picture. In the first sample, high BM companies are not characterized by the slowest growth, except in the first year after portfolio formation. It is likely the case that survivorship bias disproportionately magnifies the estimated growth of value firms, as they are more likely to die, being on average less profitable. However, separate calculations (not reported to save space) show that this bias is not driving the result after portfolio formation. In particular, when I compute portfolio growth by averaging the growth rates of all firms in the portfolio at time t, imputing a growth rate of -1 to the firms that disappear after formation, high BM firms still display larger growth rates than low BM companies in the first sample. The situation reverts in the last subsample. Here, low BM firms experience higher growth rates at all horizons before and after portfolio formation. Again, this is not likely the outcome of survivorship bias, because the results are confirmed using other procedures. Hence, given that in the late sample growth firms are high beta firms, the table provides indirect evidence that in these years beta is unambiguously related to past and future growth.

B. Discussion

The evidence that has been presented so far reveals a novel empirical fact. The decrease in the beta of value stocks is the reflection of a major change in the nature of market risk that occurred over almost eighty years of data. The drop in beta for this portfolio is related to the change in the magnitude and sign of the unconditional relationship between market valuations and betas. This fact, in turn, largely depends on the evolution in the link between the cash flow profile of listed companies and their exposure to market risk. Specifically, while in the past high market risk was typical of unprofitable firms, more recently high betas denote fast-growing firms.

Then, one naturally wonders why this development took place. The question is certainly worthwhile of future investigation. Here, I provide a possible story that leans on recent theoretical and empirical research.

Santos and Veronesi (2005) build a model that breaks down market betas into a cash flow and a discount rate component. Intuitively, the cash flow beta depends on the covariance of a firm's cash flows with aggregate payoffs. Instead, the discount rate beta reflects the systematic variance of returns that is due to shocks to the discount factor. The authors also show that, because discounting matters more for payoffs in the distant future, the longer the duration of a firm's cash flows, the higher its discount rate beta. In their paper, duration is a synonym of cash flow growth. On the empirical side, Campbell and Vuolteenaho (2004) provide estimates of cash flow (bad) and discount rate (good) betas over the same time period covered in this paper. They show that, while in the early sample the spread in betas between value and growth stocks is due to a difference in both bad and good betas, in the late sample growth stocks bear more market risk as a result of higher good betas. Moreover, in the late period, the influence of discount rate betas on total betas is predominant.

In the light of Santos and Veronesi's model, the empirical findings in Campbell and Vuolteenaho are entirely consistent with the evidence in this paper. In the distant past, value firms experience higher growth (Table VII). Then, according to Santos and Veronesi's model, they should have higher discount rate betas. This is indeed the case, as testified by Campbell and Vuolteenaho's findings. Moreover, one can easily imagine that unprofitable firms are affected most negatively by business cycle shocks. Hence, the low profitability of value firms (Table VI) can account for their higher cash flow beta. On the other hand, in the late sample, low BM firms grow faster (Table VII). Consistent with the theory, this fact is related to a positive spread in discount rate betas between low and high BM firms in the second part of the sample. In addition, value firms remain relatively unprofitable. Possibly as a consequence of that, they keep having larger cash flow betas. Finally, the spread in profitability between growth and value companies seems to shrink over time. This piece of evidence, along with the developments in the economy that I discuss below, could explain why cash flow betas have become less important than discount rate betas in determining the total market beta.

Overall, the theoretical and empirical results fit a coherent picture that centers on the increased importance of cash flow growth, as opposed to profitability, in determining exposure to systematic risk. This evolution calls for an economic explanation of its causes. In particular, one has to clarify what changes in the identity of listed companies, or in the broader economic environment, have made cash flow growth become the main determinant of market risk.

I believe that a potential explanation can be found in some of the recent literature that focuses on the increase in idiosyncratic risk. Morck, Yeung, and Yu (2000) point out a downward trend in the explanatory power of the market model for the U.S. stock market that, like the decline in the beta of value stocks, starts in the late twenties. This finding echoes the evidence in Campbell, Lettau, Malkiel, and Xu (2001). These authors show that the absolute level of idiosyncratic volatility of individual stocks has been trending upwards. Their sample starts in the early sixties, but, given Morck, Yeung, and Yu's (2000) results, one cannot rule out that the phenomenon starts even earlier.

These papers spurred a wealth of related literature.[14] In particular, Fama and French (2004) connect the increase in idiosyncratic risk to the characteristics of newly listed companies. They show that over the last three decades the number of new-lists per year has increased. Moreover, the profitability of the new firms has become progressively more left skewed, while their growth has become more right skewed. They argue that this trend is related to a general increase in the appetite for risk, or a decline in the equity premium, that has increased the supply of capital. So, new ventures are financed, even if they are not immediately profitable. On a related note, Fink, Fink, Grullon, and Weston (2005) show that companies go public at an earlier stage in their life cycle. This fact has caused the average age of firms in the market to trend down starting in the

[14]Among the others, Malkiel and Xu (2003) and Bennett, Sias, and Starks (2003) focus on the increase in institutional ownership; Wei and Zhang (2006) study the deterioration in earnings quality for listed stocks; Durnev, Morck, and Yeung (2003) and Durnev, Morck, Yeung, and Zarowin (2003) focus on the informational efficiency of the stock market.

early fifties. Given that younger firms are riskier, they argue that this effect is capable of explaining the surge in idiosyncratic volatility.[15]

These results point out a major change in the economic environment that, I believe, is relevant for explaining the evidence in the current paper. The inflow of faster growing businesses has affected the whole distribution of listed firms (see Fama and French (2004)) to the point that, in the last decades, growth has progressively become a relevant characteristic of public companies. In the light of the previous discussion, this evolution may play a role in the observed increase in the discount rate component of beta. Also, this fact can explain why market betas have become more correlated with growth and less with profitability, affecting the correlation between market betas and valuations. The picture that I delineate is one where, in the first decades of the sample, the profile of a firm's cash flows is generally flatter, and a risky company is one that suffers in recessions. This is an unprofitable value company with high cash flow beta. Later on, as growth starts to become a widespread (hence, systematic) characteristic of the economy, a stock that bears more systematic risk is one whose payoffs are stretched farther out in time. This is a growth firm with high discount rate beta. According to this interpretation, the increased importance of growth companies in the market would explain not only the surge in idiosyncratic risk, but also the changing nature of systematic risk, which is the focus of this paper.

Although out of the scope of this study, one may ask what caused this evolution in the growth profile of listed companies. As said above, a potential answer is provided by Fama and French (2004), who identify the culprit in the decrease in the equity premium, which they document in another paper (Fama and French (2002)). Different from Polk, Thompson, and Vuolteenaho's (2006) conjecture, the present study does not identify a decline in the equity premium as the main source of the drop in the beta of value stocks. However, if the market risk premium indeed goes down over the sample, this fact is likely to reinforce the surge in correlation between beta and growth, which is identified in this paper. Again, the justification can be found in Santos and Veronesi (2005). In their model, if the discount rate drops, future payoffs weigh more heavily on current stock prices, and the discount rate beta is a more important component of the total beta. Hence, the increased correlation between beta and growth could eventually follow from a drop in the equity premium. In this suggestive view, the decrease in the equity premium, the rising importance of growth for listed companies, the surge in idiosyncratic risk, and the changing nature

[15] The findings in Fink, Fink, Grullon, and Weston (2005) are in apparent contradiction to Loughran and Ritter (2004), who do not find a trend in the age at IPO. However, the first authors use a larger set of IPO's, which could explain the different results

of systematic risk would all be parts of a unique picture.

V. Robustness Checks and Other Risk Measures

A. Robustness

As argued above, a potential concern for the cross-sectional regressions of Section III is measurement error in betas. Risk loadings are computed at the level of the individual security using at least twenty-four and at most sixty monthly returns. Potential instability in the betas, return outliers, short listing history are among the sources of measurement error in security betas. If risk loadings are measured with error, the significant role of fundamentals in absorbing the trend in the slope on beta could be due to the fact that cash flow variables are better proxies for risk than beta itself. In this case, the decline in the equity premium could not be ruled out as an explanation for the decrease in the beta of value stocks. The next evidence seems to exclude a significant role of measurement error and to confirm the previous inference.

A standard solution to measurement error in betas is aggregating firms into portfolios. Given that the regressions aim at explaining the cross-section of valuations, a natural candidate for sorting firms is their BM ratio. Every year, I form fifty groups of firms according to the BM distribution in December. The dependent variable in the cross-sectional regressions is the logarithm of portfolio BM, which is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization in December. The independent variables are formed from the combination of firm level characteristics. The portfolio beta is the value-weighted average of the betas of the stocks in the portfolio using market capitalization in December of year t as weights. The dividend ratio (Divbook) is the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$. Similarly, but using repurchases instead of dividends, I compute the repurchase ratio (Repbook). The zero-dividend dummy (Zdiv) is the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t. Portfolio ROE is the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$. The loss dummy (Loss) is the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t. Age is the average of the age of the firms in the portfolio in year t. Portfolio book value (Book) is the logarithm of total book value for the firms in the portfolio in year t. Finally, the portfolio forecast of long term growth (Anfor) is the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

Table VIII reports the coefficients from portfolio level Fama and MacBeth (1973) cross-sectional regressions. The results largely confirm the evidence in Table III. In the whole sample, once all controls are included in the specification, the slope on beta becomes insignificantly different from zero. Furthermore, the sign on the other variables is consistent with their role as cash flow predictors and reflects the previous findings. In the first subsample, beta remains significant also when controlling for the cash flow variables. However, the size of its slope in the multivariate specification is roughly divided by four, suggesting that the correlation between beta and cash flow predictors plays an important role in the cross-section of valuations. Symmetrically, in the last subsample the slope on beta is squeezed towards zero by the inclusion of the cash flow variables. The R^2 coefficients are in general higher than in the firm level regressions, also reflecting the smaller number of data points to fit. Still, the low BSV coefficients reflect the minor role played by beta in explaining the cross-section of valuations (and in most cases beta has the 'wrong' negative sign).

Figure 4 plots the time series of the slopes on beta from the cross-sectional regressions. The series of univariate slopes on beta (thin solid line) displays the known downward trend. Remarkably, the series of coefficients from the full multivariate specification (thick solid line) is much flatter around zero, confirming the role of the cash flow predictors in absorbing most of the trend. Finally, unlike the case of firm level regressions, excluding analyst forecasts from the multivariate specification (dashed line) does not alter the ability of the cash flow controls to flatten the series in the last subsample. This finding suggests that, perhaps, measurement error is a concern for cash flow controls as well, and that forming portfolios reduces this problem.

The main results in Polk, Thompson, and Vuolteenaho (2006) are obtained using Spearman rank correlation between valuation ratios and beta at the level of individual securities, rather than regression analysis. They are argue that this strategy attenuates the effect of outliers and the hard-wired link between market valuation and the cross-sectional spread in the valuation ratios. I replicate their procedure for both the univariate specification and the multivariate specification. In the latter case, I first orthogonalize the dependent variable (the log of BM) with respect to the usual cash flow variables by running cross-sectional regressions for each year in the sample. Then, I compute the rank correlation between the residuals from these regressions and beta. Figure 5 plots the series of correlations for the univariate specification (thin solid line), and for two multivariate specifications that differ on whether they include analyst forecasts (solid line), or exclude them (dashed line). This different methodology does not contradict the evidence in Figure 3, which is obtained using the regression approach. The series from the univariate specification displays the usual decreasing trend. Instead, the series that accounts for the cash flow predictors looks more stationary around zero. After 1980, this impression is confirmed only if analyst forecasts are included among the controls. It is, perhaps, the exclusion of this variable that drives Polk, Thompson, and Vuolteenaho (2006) to conclude that the results from the univariate and multivariate specifications do not differ. Their conclusion could also be due to the choice of measuring cash flow predictors using percentile ranks, rather than levels. This approach possibly reduces the explanatory power of these variables in the regressions.

It is interesting to verify whether the results from the cross-sectional regressions are robust to alternative measures of valuation. Two valid candidates are the dividend-to-price ratio (D/P) and the earnings-to-price ratio (E/P). Once again, the analysis is conducted by aggregating the dependent and independent variables at portfolio level to control for measurement error. Excluding firms with zero dividends and with negative earnings, every year I form fifty D/P and fifty E/P portfolios, using the valuation ratio in December. Then, I compute the portfolio level variables following the aggregation procedure described at the beginning of this section. The portfolio valuation ratio, either the log of D/P or the log of E/P, is regressed cross-sectionally on betas, with and without the cash flow controls. For each ratio, Figure 6 plots the series of slopes on beta from the univariate (dashed line) and multivariate (solid line) regressions. The latter include all the available cash flow controls that were discussed above. Although the downward trend in the univariate slope on beta is less visible than before, it is still the case that with these new valuation ratios the average level of the series is lower in the second subsample. In both cases, including the cash flow controls flattens the series of estimated slopes around zero. This analysis mostly confirms the result that the decline in the link between valuation and market risk is due to the changing correlation between beta and cash flow characteristics.

B. Alternative Risk Measures

As said in the introduction, while most of the focus of this paper is on the market factor, the analysis is briefly extended to a few other measures of systematic risk. On the one hand, this exercise acknowledges the recent asset pricing literature. On the other hand, it makes explicit the interaction between the evolution of market risk and that of the alternative measures of systematic risk.

Among the many available alternatives, I choose three notable examples. The first one is the three-factor model proposed by Fama and French (1993), which has a remarkable statistical performance, although the economic motivation of its success is not fully identified. I select this model because it is to date the most famous alternative to CAPM. The second one is the two-factor model by Campbell and Vuolteenaho (2004), which is inspired by Merton's (1973) ICAPM. In this case, the choice naturally follows from the discussion in Section IV on the sources of change in the market beta. Finally, in the vast literature on consumption based asset pricing[16], I choose the model by Bansal, Dittmar, and Lundblad (2005), as an example of the recent research on risks for the long run (Bansal and Yaron (2004)).[17]

In all cases, the empirical question concerns the relationship between valuation, on the one hand, and factor loadings and cash flows, on the other hand. In particular, it is interesting to observe whether cash flow variables absorb part of the explanatory power of risk loadings, as it is observed for CAPM. This analysis, in turn, potentially reveals what type of characteristics of the cash flow profile of a firm determine the risk exposures.

Table IX reports the correlations among the different risk loadings. It appears that the risk measures are in general positively correlated, except for the loading on HML (Lhml) in the late sample. The negative correlation of Lhml with the market beta and the good beta reflects the main evolution that is described in this paper: high market beta stocks evolve from value to growth firms. Similar evidence is provided by the negative correlation between the bad beta (which is high for cyclical firms) and the good beta (which is high for growth firms), and the very low correlation between the bad beta and the market beta in the late sample.

In the Fama and MacBeth (1973) cross-sectional regressions, I once again use variables that are aggregated at portfolio level according to the usual procedure. In this case, the risk loadings are obtained from each of the three alternative asset pricing models, as described in Section II. Table X reports the coefficients and Figures 7, 8, and 9 plot the slopes on beta from the univariate (dashed line) and multivariate regressions (solid line), which include all the available cash flow controls.

[16]Starting with the model by Breeden (1979), this literature has recently been brought back in fashion by Lettau and Ludvigson (2001).

[17]Other examples are: Parker (2001), Parker and Julliard (2004), Colacito and Croce (2004), Bansal, Dittmar, and Kiku (2005), Hansen, Heaton, and Li (2005), Kiku (2005), Malloy, Moskowitz, and Vissing-Jorgensen (2005), Hansen and Sargent (2006).

Panel A of Table X and Figure 7 focus on the three-factor model. The graph reveals that the downward trend that was observed for the slope on beta is now spread over the three factors. Still, the series from the multivariate regressions are closer to zero than those from the univariate case. The comparison between the univariate R^2 and the BSV coefficient in the table reveals that much of the explanatory power of the risk loadings comes from the omitted cash flow variables. Nevertheless, the three-factor model displays the highest BSV coefficient among all the models that are considered in this paper (32% in the whole sample). This result is imputable to the explanatory of power of Lhml, which is by far the most significant of the three. This finding should not surprise, given the evidence of positive covariance among firms with similar BM (Fama and French (1993)). For the same reason, the slope on Lhml is positive both in the univariate and the multivariate case. Still, adding the controls for cash flows significantly reduces the importance of Lhml in explaining valuations. Unreported results show that the major role in reducing the explanatory power of Lhml is played by the dividend ratio, while the impact of analyst forecasts is less important. This finding, along with the evidence on Divbook in Table II, suggests that the loading on HML is mostly correlated with profitability. This conclusion is in line with Fama and French (1995), who find a BM factor in earnings.

Panel B of Table X and Figure 8 report the results from cross-sectional regressions that include Campbell and Vuolteenaho's (2004) two betas. Section IV explained the drop in the market beta with the increase in the correlation between beta and growth. I conjectured that this fact coincides with a surge of the discount rate beta (good beta) of growth companies, which eventually inverted the sign of the correlation between BM and the total beta. This conjecture finds a confirmation in Figure 8. The trend in the slope on the overall market beta is replicated by the decrease in the univariate slope on good beta (bottom chart, dashed line). The univariate slope on the bad beta remains mostly positive (top chart, dashed line), consistent with high BM firms having high cash flow betas throughout the sample, possibly as a result of their low profitability.

The inclusion of the cash flow variables reduces the explanatory power of both betas in Table X. Also, it makes the series of multivariate slopes on beta much flatter and closer to zero. Unreported results, from specifications in which BM is regressed separately on the bad and good beta, reveal that the cash flow controls interact differently with the two betas. In particular, the variables that are related to profitability (see Table II), and especially the dividend ratio, are responsible for the reduction in the explanatory power of the bad beta. In contrast, while in the first part of the sample the good beta loses its power mostly to the dividend ratio, in the late sample its effect is especially absorbed by growth related variables, such as analyst forecasts and age. Again, these results are entirely consistent with the discussion in Section IV on the relation between the two betas, on the one hand, and profitability and growth, on the other.

Finally, Figure 9 and Panel C of Table X focus on the consumption model by Bansal, Dittmar, and Lundblad (2005). The slope on the consumption beta is on average positive in the overall sample (1967-2005), which is consistent with the success of this model in explaining the returns on BM portfolios. The inclusion of the cash flow controls completely absorbs the explanatory power of beta and makes its slope insignificantly different from zero. The study of the isolated effects of the different cash flow variables (not reported) suggests that the consumption beta is negatively correlated with both profitability and growth. The correlation with growth is stronger in the late sample. One can make sense of these findings by remembering that the consumption beta captures the covariance of dividends with the growth rate of consumption. It is plausible that the firms that are obliged to cut dividends along the business cycle are the least profitable ones. Also, in the late sample fast growing firms do not pay dividends, which could explain the negative correlation between this risk loading and growth.

Overall, the analysis of the alternative risk models provides corroboration to the evidence of correlation between the risk exposure and the cash flow characteristics of the firm that was presented in this paper. In particular, the risk measures that proved mostly relevant in explaining returns in other studies (such as the loading on HML, the bad beta, and the consumption beta) are negatively correlated with profitability. One could interpret this results as suggesting that, when pricing assets, investors care mostly about risks that are related to profitability, while they fear less the discount rate risk that is associated to growth. Alternatively, a supporter of the behavioral view could argue that these risk measures are correlated with characteristics that make these firms out of favor stocks, such as the status of unprofitable firm with low expected growth. This double interpretation characterizes some of the results in the next section as well.

VI. Assessing the Impact of Fundamentals

Using an alternative portfolio formation procedure, this section provides direct evidence of the role of fundamentals in the decrease of the beta of value stocks. As a by-product, this methodology allows the assessment of the impact of cash flow characteristics on average returns and the value premium.

A. Residual BM Portfolios

The previous results suggest that the correlation between factor loadings and fundamentals affects the univariate relationship between BM and beta. To a large extent fundamentals reflect cash flow expectations. Hence, the BM sort generates portfolios of firms that are strongly characterized in terms of their expected operating performance. Given that fundamentals are correlated with discount rates, the sort on BM indirectly produces a sort on risk loadings as well. However, risk measures, like market beta in the last decades, can be positively correlated with variables that boost valuations, such as expected growth. So, the BM sort can generate a counterintuitive situation where value stocks have low risk loadings.

In order to filter the effect of fundamentals out of valuations, one can orthogonalize the BM ratio with respect to the cash flow variables. Ideally, the residual component of BM is free from the correlation between beta and cash flows. It should capture the component of value that is determined by the part of risk that is orthogonal to cash flow expectations. To be explicit, the part of beta that is left in BM after this process can depend on the volatility of the fundamentals and their covariance with systematic risk factors, but only to the extent that these characteristics are not captured by the cash flow predictors.

In practice, one can never fully control for the cash flow expectations. Still, if the effect of fundamentals has been sufficiently absorbed, one should not observe a decline in beta for portfolios formed on the basis of this residual measure of BM. If the downward trend in beta is still present for this orthogonalized portfolios, then the explanation that is based on the decline in the equity premium acquires more credit.

Each year, I run a firm-level cross-sectional regression of the (the log of) BM in December on all the usual cash flow predictors. The residuals from these regressions determine the 'residual BM' of each firm. Then, I form ten decile portfolios in July of year t using the distribution of the residual BM in year $t-1$. Returns are value-weighted between July of year t and June of year $t+1$.

Figure 10 reports the market beta for the tenth residual BM portfolio (solid line). As a reference, it also plots the beta of the tenth BM portfolio (dashed line), which displays the known decreasing pattern. Betas are estimated on five-year rolling windows, like in Figure 1. The reassuring result in the figure is the lack of a trend for the beta of the residual BM portfolio. Although there are some years in which the two series behave similarly, such as the peak at the beginning of the sample and the drop in the late nineties, these episodes do not create the impression of a downward trend in the beta of the residual BM portfolio. Rather, these events could be due to temporary changes in the equity premium or, more simply, to the fact that one cannot fully control for cash flow expectations.

In conclusion, Figure 10 provides further confirmation of the fact that the decrease in the beta of value stocks is related to the changing correlation between factor loadings and fundamentals.

B. The Value Premium

As said, this paper takes no stance on the correct asset pricing model. It focuses on the determinants of the evolution of market risk. However, after having studied the importance of cash flow characteristics for risk and valuation, one naturally wonders about the implications of these results for returns. While a full treatment of this topic is beyond the scope of this paper, still the residual BM portfolios offer the unique opportunity to assess the importance of fundamentals for the value premium.

The residual BM measure represents the component of value that is orthogonal to the cash flow variables. By comparing the returns on residual BM portfolios with the returns on the standard BM portfolios one can quantify the impact of fundamentals on returns. This effect can derive either from the correlation of cash flows and risk loadings, which are of pricing concern to investors, or from expectational errors, which are caused by firm fundamentals. This distinction is further discussed below.

Table XI reports summary statistics and estimates from CAPM regressions for ten BM and ten residual BM portfolios. Panel A shows the known pattern where high BM portfolios earn higher average returns than low BM portfolios in all subsamples. This evidence represents the so-called value premium. Instead, one notices that this regularity is much less pronounced in the case of residual BM portfolios. The spread in average returns between the tenth and first portfolios is roughly cut in half for the residual portfolios. Panel B provides similar evidence in the context of the CAPM. In the whole sample, high BM stocks have higher alphas than low BM stocks. This is not true for the high residual BM portfolio. In the second part of the sample, the statistical failure of CAPM in pricing BM sorted portfolios materializes. Over this period, value stocks earn significantly positive abnormal returns. In case of the BM sort, the spread portfolio has an alpha of 0.64% monthly (last column), which is both statistically and economically significant. By contrast, using residual BM as sorting variable cuts the alpha of the spread portfolio roughly in two and makes it no longer significant.

The important conclusion from Table XI is that filtering the effect of cash flows out of the BM ratio roughly halves the value premium. There are at least two possible interpretations of this evidence. The first one relates to the risk based explanations of the value anomaly. Given that the exposure to the relevant risk factors is determined by the cash flow characteristics of the firm, as it is confirmed by the analysis of the asset pricing models in Section V, the residual BM measure is not informative about priced risks. Hence, sorting according to this variable does not produce a spread in expected returns. The second interpretation is centered around errors in expectations, as in Lakonishok, Shleifer, and Vishny (1994), and Daniel and Titman (1997). In this story, valuations reflect incorrect expectations of future cash flows, which are driven by the recent performance of the firm. It is likely that the cash flow controls are part of the information set used by investors when forming their cash flow expectations.[18] Then, when partialling the cash flow information out of BM, one obtains a measure of value that is cleansed from these mistaken expectations. Consequently, the residual BM sort does not generate a spread in returns.

The evidence in this study cannot tell these explanations apart. However, the finding of a significant effect of these cash flow variables on the magnitude of the value premium can result useful in directing future research. On the one hand, the risk exposure to priced risk factors will have to be founded on identifiable characteristic of the cash flow profile of the firm. On the other hand, a behavioral explanation that is based on errors in expectations will have to make explicit the characteristics of the firm fundamentals that drive expectations and that quantitatively account for the realized premium.

VII. Concluding Remarks

The motivation for this study is the evolution of value firms from high beta to low beta stocks. The paper relates this fact to a major change in the correlation between risk exposure and fundamentals that takes place over the past eighty years. In the early decades of the sample, the firms that bear more market risk are the ones displaying poor economic performance and having the lowest valuations. Over time, market risk is increasingly connected to growth. As a consequence, in the late part of the sample, high beta stocks are growth companies with high valuations.

The paper proposes an interpretation of this evidence that hinges on a structural modification in the economic environment. Recent results (Fama and French (2004)) report an upward trend in

[18] In the case of analyst forecasts, there is actually a direct measure of these expectations.

the importance of growth for listed companies. These findings inspire the conjecture that, at the beginning of the sample, when short term cash flows represent the main determinant of value, the relevant source of systematic risk is the business cycle. If that is the case, in the early decades, the firms that are mostly exposed to economic fluctuations are distressed value companies. On the other hand, as listed companies become more growth oriented and have longer cash flow duration, the nature of systematic risk changes. Volatility in discount rates represents a major source of systematic variation in the present value of future payoffs. In this world, faster growing firms are more exposed than others to market risk. Echoing recent theoretical and empirical research, this development can be portrayed as an increase in the discount rate component of beta relative to the cash flow component.

The suggested interpretational key, i.e. the increasing weight of growth in the fundamentals of listed firms, requires further investigation. While the literature conjectures that the decline in the equity premium plays a role in this development, a full account of its causes is still missing. Moreover, it appears that different features of firm fundamentals (i.e. profitability and growth) have time-varying importance in determining risk exposures. If possible, future research should make explicit the role of the macroeconomic environment in causing the observed evolution in the link between cash flows and risk.

These considerations have some methodological implications. Although conditional asset pricing models include variables that predict the business cycle in investors' information set, they do not acknowledge the role of firm fundamentals. This element could represent an important piece of conditioning information.

On a related note, the paper raises a major caveat concerning the approach of forming portfolios along the dimension of valuation. The correlation between factor loadings and fundamentals has evolved along a secular trend. At a smaller scale, the evidence that the beta of value stocks increases in recessions (see, for example, Lettau and Ludvigson (2001)) can reflect a qualitatively similar phenomenon. In the light of these findings, aggregating firms with similar valuations in the same portfolio, and considering the risk exposure of this portfolio as stable over time can be misleading. In this case, conditional models with time-varying factor loadings, can represent a solution.

The paper identifies a role of cash flow predictors in explaining a significant fraction of the value premium. Irrespectively of its interpretation, this finding can guide future research. A risk based explanation should clarify what feature of firm fundamentals is captured by these variables, and how it determines the exposure to the relevant risk factors. Instead, a behavioral story needs to relate the ability of these variables in explaining the mispricing to a cash flow characteristic that drives investors' erroneous expectations.

Finally, this study focuses on the long run interaction between fundamentals and the exposure to systematic risk. The detail of the analysis is constrained by the availability of data over this long horizon and by the need of providing a global perspective on the developments. Still, the paper shows the necessity of identifying the determinants of risk exposure in specific characteristics of a firm's cash flows. Without the concern of the historical perspective, future research can certainly explore with greater detail the relation between fundamentals and systematic risk for the firms in today's economy.

Appendix: Consumption Betas

For each firm, the consumption beta ($cbeta_i$) results from the OLS regression:

$$g_{i,t} = cbeta_i \left(\frac{1}{K} \sum_{k=1}^{K} g_{c,t-k} \right) + u_{i,t}, \tag{A-1}$$

where $g_{i,t}$ is the dividend growth rate and $\frac{1}{K} \sum_{k=1}^{K} g_{c,t-k}$ is a trailing moving average of past consumption growth. Both growth rates are measured at quarterly frequency. As in Bansal, Dittmar, and Lundblad (2005), K is set to eight. In more detail, the log dividend growth rate $g_{i,t}$, is constructed by taking the first difference of log quarterly deseasonalized real dividends. Quarterly deseasonalized dividends are defined as a four-quarter average of quarterly dividends, which in turn are the sum of monthly dividends. The quarterly frequency is due to the availability of consumption data. Consumption is measured as the seasonally adjusted real per capita consumption of nondurables plus services and is obtained from the NIPA tables. Consumption growth $g_{c,t}$ is the first difference of log real consumption. Both dividends and consumption are converted to real variables using the personal consumption expenditures (PCE) deflator from the NIPA tables. The year t consumption beta is the slope $cbeta_i$ from running the regression in equation (A-1) in the fourth quarter of the year on at least twenty and at most sixty quarters of prior data.

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Table I: Summary Statistics. The table reports means and standard deviations for the variables that are used in the analysis. The table also reports the average annual number of firms in different subsamples. The variables that are included are: the book-to-market (BM) ratio, computed as book value in fiscal year t divided by market capitalization in December of year t; the ratio of total dividends in year t to book value at the end of year t (Divbook); a dummy variable, which equals one for firms paying zero dividends in year t (Zdiv); the ratio of share repurchases in year t to book value at the end of year t (Repbook); the return on equity (ROE); a dummy variable, which equals one for firms with negative earnings in year t (Loss), firm's age (Age); the logarithm of book value in year t (Book); and the median analyst forecast of long run growth in percent (Anfor), which is available from IBES since 1981. The values of the variables ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order).

	BM	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	N. firms
				Whole Sample: 1929-2005						
Mean	1.22	0.04	0.31	0.01	0.15	0.16	18.03	576.62		1325.97
S.d.	2.43	0.05	0.46	0.04	0.36	0.18	13.92	2637.37		
				1929-1953						
Mean	2.49	0.06	0.23	0.00	0.16	0.11	14.19	69.98		615.88
S.d.	5.35	0.06	0.42	0.01	0.37	0.14	6.96	199.05		
				1954-1980						
Mean	1.23	0.04	0.22	0.00	0.10	0.15	18.21	234.52		1620.78
S.d.	1.38	0.04	0.41	0.02	0.30	0.15	13.76	1040.01		
				1981-2005						
Mean	0.76	0.03	0.42	0.03	0.20	0.18	19.21	1106.91	15.95	1717.68
S.d.	0.99	0.05	0.49	0.05	0.40	0.21	15.62	3863.86	8.06	

Table II: Forecasting ROE and Growth. The table reports the results from Fama and MacBeth (1973) regressions of future values of ROE and earnings growth on a number of forecasting variables measured at firm level. In each year t, the dependent variables are: ROEi, the Return on Equity measured i periods ahead, and Growth$i$, the growth in real earnings between period t and period $t+i$, where $i = 1, 3, 5$. For firms that are no longer in the sample in year $t+i$, Growth is set equal to -1. The independent variables in year t are: the ratio of total dividends in year t to book value at the end of year t (Divbook), a dummy variable, which equals one for firms paying zero dividends in year t (Zdiv), the ratio of share repurchases in year t to book value at the end of year t (Repbook), a dummy variable for firms with negative earnings in year t (Loss), the return on equity (ROE), firm's age (Age), the logarithm of book value in year t (Book), and the median analyst forecast of long run growth in percent (Anfor), which is available from IBES since 1981. Anfor is only included in the regressions of the third sample. The values of the regressors ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$. For readability, the coefficient on Divbook has been divided by 100 and those on Book and Anfor multiplied by 100. The reported coefficients are means of estimates from yearly regressions. T-statistics (in parentheses) are computed using the standard errors of the mean. The mean R^2 of the yearly regressions is also reported.

	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2
ROE1	0.37	-0.01	-0.11	-0.05	0.18	-0.10	-0.68		0.11
	(10.49)	(-1.40)	(-0.59)	(-5.41)	(11.98)	(-3.06)	(-5.61)		
ROE3	0.40	0.01	0.15	-0.00	0.11	-0.12	-0.52		0.06
	(5.98)	(1.34)	(0.69)	(-0.50)	(6.70)	(-3.01)	(-4.14)		
ROE5	0.44	0.01	-0.06	0.01	0.06	-0.16	-0.42		0.05
	(4.68)	(1.35)	(-0.23)	(2.76)	(4.86)	(-3.32)	(-3.62)		
Growth1	0.30	0.31	2.35	-1.93	-1.46	-1.55	-3.59		0.04
	(2.05)	(6.84)	(0.48)	(-19.30)	(-13.59)	(-2.38)	(-4.40)		
Growth2	0.10	0.74	-8.07	-2.55	-2.20	-3.28	-2.83		0.05
	(0.59)	(4.96)	(-1.31)	(-12.65)	(-9.50)	(-2.14)	(-1.30)		
Growth3	0.06	0.61	-0.51	-2.43	-2.05	-4.85	-2.72		0.05
	(0.26)	(5.21)	(-0.08)	(-15.07)	(-10.23)	(-2.41)	(-1.91)		

(*continued*)

Table II: *Continued*

	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2
				1929-1953					
ROE1	0.12	-0.03	-0.60	-0.00	0.17	-0.13	-0.61		0.16
	(9.45)	(-3.57)	(-1.14)	(-0.14)	(6.54)	(-1.71)	(-2.16)		
ROE3	0.09	-0.00	0.03	0.00	0.15	-0.13	-0.67		0.10
	(7.51)	(-0.33)	(0.05)	(0.40)	(4.46)	(-1.16)	(-2.40)		
ROE5	0.09	-0.00	-0.52	-0.00	0.06	-0.17	-0.84		0.08
	(9.13)	(-0.31)	(-0.67)	(-0.40)	(2.85)	(-1.34)	(-3.59)		
Growth1	-0.02	0.43	0.70	-2.10	-1.73	-3.57	-4.81		0.05
	(-0.23)	(3.76)	(0.05)	(-8.14)	(-6.61)	(-1.87)	(-2.42)		
Growth3	-0.20	1.32	-31.60	-3.34	-2.93	-8.36	-1.36		0.06
	(-1.66)	(3.37)	(-1.82)	(-6.47)	(-5.27)	(-1.90)	(-0.22)		
Growth5	-0.19	1.08	-8.54	-3.18	-2.94	-11.38	-3.47		0.07
	(-1.59)	(3.63)	(-0.45)	(-8.47)	(-6.30)	(-2.02)	(-0.97)		
				1954-1980					
ROE1	0.33	0.01	0.12	-0.03	0.24	-0.13	-0.55		0.11
	(12.92)	(2.04)	(0.84)	(-2.56)	(9.62)	(-4.55)	(-3.44)		
ROE3	0.31	0.02	0.24	0.00	0.12	-0.13	-0.36		0.06
	(10.15)	(3.20)	(1.71)	(0.57)	(5.44)	(-3.66)	(-2.10)		
ROE5	0.30	0.02	0.22	0.03	0.09	-0.15	-0.14		0.05
	(10.47)	(2.66)	(1.31)	(3.66)	(4.63)	(-4.02)	(-0.93)		
Growth1	0.12	0.25	4.78	-1.69	-1.30	-0.44	-3.17		0.04
	(1.07)	(5.07)	(2.80)	(-21.29)	(-9.56)	(-2.31)	(-3.59)		
Growth3	0.02	0.62	6.00	-2.26	-2.19	-0.74	-5.20		0.05
	(0.12)	(4.71)	(3.05)	(-12.72)	(-7.09)	(-2.04)	(-3.38)		
Growth5	-0.04	0.47	5.39	-2.08	-1.76	-1.33	-3.47		0.04
	(-0.20)	(4.52)	(2.15)	(-16.73)	(-7.92)	(-4.67)	(-2.10)		
				1981-2005					
ROE1	0.94	-0.02	0.12	-0.11	0.11	0.07	-0.72	0.45	0.09
	(6.21)	(-2.43)	(2.37)	(-12.95)	(5.22)	(1.08)	(-2.72)	(6.96)	
ROE3	1.00	-0.00	0.16	-0.02	0.04	-0.00	-0.26	0.23	0.03
	(6.40)	(-0.32)	(4.21)	(-1.78)	(2.25)	(-0.05)	(-1.52)	(4.25)	
ROE5	1.19	0.01	0.21	0.00	0.04	-0.12	-0.04	0.08	0.03
	(3.89)	(0.85)	(4.32)	(0.09)	(2.34)	(-2.03)	(-0.17)	(1.24)	
Growth1	0.71	0.13	1.43	-1.88	-1.66	-0.50	-3.56	1.88	0.03
	(1.04)	(2.25)	(3.58)	(-15.26)	(-10.60)	(-1.39)	(-2.41)	(4.10)	
Growth3	1.31	0.17	2.26	-1.86	-1.67	-0.32	-1.85	2.00	0.04
	(1.35)	(2.41)	(4.63)	(-12.88)	(-6.33)	(-0.74)	(-0.92)	(4.21)	
Growth5	1.15	0.25	1.96	-1.84	-1.67	-0.91	-0.76	1.69	0.03
	(1.24)	(2.65)	(4.05)	(-10.78)	(-7.06)	(-2.19)	(-0.40)	(3.35)	

Table III: Cross-Sectional Determinants of the BM Ratio. The table reports the results from Fama and MacBeth (1973) firm level regressions of the book-to-market (BM) ratio in year t on different sets of explanatory variables. The independent variables in year t are combinations of: the stock beta, which is computed on at least two years and at most five years of monthly returns before December of year t, the ratio of total dividends in year t to book value at the end of year t (Divbook), a dummy variable, which equals one for firms paying zero dividends in year t (Zdiv), the ratio of share repurchases in year t to book value at the end of year t (Repbook), the return on equity (ROE), a dummy variable, which equals one for firms with negative earnings in year t (Loss), firm's age (Age), the logarithm of book value in year t (Book), and the median analyst forecast of long run growth in percent (Anfor), which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$. The reported coefficients are means of estimates from the yearly regressions. T-statistics (in parentheses) are computed using the standard errors of the mean. The mean R^2 of the yearly regressions is also reported. Finally, the table reports the (average) share of the variance of BM that is due to the covariance between BM and beta times the estimated slope in the regression (BSV).

Beta	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2	BSV
Whole Sample: 1929-2005										
0.11									0.06	
(2.60)										
-0.14	-7.53	0.04							0.26	0.03
(-5.74)	(-20.68)	(0.91)								
-0.14	-7.42	0.04	-1.27						0.27	0.03
(-5.73)	(-19.81)	(0.96)	(-2.27)							
0.10				0.12	-1.75				0.20	0.05
(2.94)				(3.88)	(-15.56)					
0.13						1.96	0.01		0.09	0.06
(3.08)						(6.78)	(0.84)			
-0.08	-6.36	0.05	-0.82	0.12	-0.96	0.71	0.04		0.35	0.03
(-3.45)	(-20.05)	(1.15)	(-1.19)	(4.96)	(-14.03)	(3.78)	(6.02)			
-0.04	-6.52	0.08	-0.77	0.11	-0.84	0.56	0.03	-0.04	0.39	0.02
(-1.91)	(-21.28)	(2.05)	(-1.12)	(4.90)	(-11.27)	(2.82)	(4.12)	(-22.55)		

(*continued*)

Table III: *Continued*

Beta	Divbook	Zdiv	Repbook	Loss	Roe	Age	Book	Anfor	R^2	BSV
					1929-1953					
0.58									0.12	
(12.71)										
0.08	-7.35	0.47							0.43	0.02
(2.06)	(-15.78)	(6.14)								
0.08	-7.35	0.47	-2.67						0.43	0.02
(2.09)	(-15.73)	(6.12)	(-1.70)							
0.46				0.21	-2.13				0.29	0.10
(12.15)				(2.75)	(-11.01)					
0.60						3.29	0.05		0.16	0.13
(12.91)						(4.67)	(2.68)			
0.12	-6.25	0.44	0.01	0.12	-0.64	1.22	0.08		0.50	0.03
(3.38)	(-14.80)	(6.54)	(0.01)	(2.16)	(-4.44)	(2.41)	(5.33)			
					1954-1980					
-0.02									0.02	
(-0.67)										
-0.23	-10.34	-0.19							0.26	0.01
(-9.83)	(-25.08)	(-3.76)								
-0.22	-10.35	-0.19	0.69						0.26	0.01
(-9.72)	(-24.92)	(-3.80)	(1.29)							
0.02				0.00	-2.27				0.19	0.01
(0.51)				(0.08)	(-15.54)					
0.00						2.30	-0.04		0.06	0.01
(0.02)						(13.20)	(-3.80)			
-0.14	-8.76	-0.21	-0.41	0.03	-1.43	1.09	0.01		0.35	0.01
(-5.63)	(-23.39)	(-7.19)	(-1.03)	(1.04)	(-22.02)	(10.79)	(1.04)			
					1981-2005					
-0.21									0.03	
(-8.67)										
-0.27	-4.69	-0.13							0.09	0.04
(-9.08)	(-10.88)	(-5.18)								
-0.27	-4.31	-0.13	-1.99						0.11	0.04
(-9.16)	(-10.88)	(-5.15)	(-20.13)							
-0.16				0.17	-0.82				0.12	0.03
(-8.03)				(6.77)	(-9.71)					
-0.19						0.26	0.02		0.05	0.03
(-8.64)						(0.91)	(1.97)			
-0.22	-3.88	-0.08	-2.11	0.20	-0.78	-0.20	0.04		0.21	0.03
(-10.14)	(-11.08)	(-3.55)	(-15.49)	(9.15)	(-11.50)	(-1.25)	(5.31)			
-0.09	-4.38	0.03	-1.95	0.20	-0.41	-0.67	0.00	-0.04	0.31	0.02
(-5.03)	(-11.20)	(1.66)	(-14.97)	(9.15)	(-6.94)	(-3.97)	(0.42)	(-22.55)		

Table IV: Cash Flow Predictors on Beta. The table reports the results from Fama and MacBeth (1973) univariate regressions. In each year t, univariate regressions are run of a number of dependent variables on beta. Beta is computed on at least two years and at most five years of monthly returns before December of year t. In each univariate regression in year t, the dependent variables are: the ratio of total dividends in year t to book value at the end of year t (Divbook), a dummy variable, which equals one for firms paying zero dividends in year t (Zdiv), the ratio of share repurchases in year t to book value at the end of year t (Repbook), the return on equity (ROE), a dummy variable, which equals one for firms with negative earnings in year t (Loss), firm's age (Age), the logarithm of book value in year t (Book), and the median analyst forecast of long run growth in percent (Anfor), which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$. For readability, the coefficients on Repbook and Age have been multiplied by 100. The reported coefficients are means of estimates from the yearly regressions. T-statistics in parentheses are computed using the standard error of the time-series mean.

	Indep. Var.: Beta			
	1929-2005	1929-1953	1954-1980	1981-2005
Divbook	-0.03	-0.04	-0.02	-0.02
	(-19.58)	(-22.34)	(-17.29)	(-11.94)
Zdiv	0.28	0.35	0.21	0.29
	(21.50)	(13.92)	(12.01)	(19.16)
Repbook	0.35	0.03	0.12	0.91
	(2.68)	(0.68)	(2.52)	(2.46)
Loss	0.09	0.15	0.05	0.06
	(8.06)	(5.90)	(6.02)	(6.83)
ROE	0.02	-0.04	0.02	0.06
	(2.49)	(-4.48)	(3.83)	(6.18)
Age	-1.00	0.37	-1.18	-2.17
	(-6.71)	(7.18)	(-5.38)	(-15.23)
Book	-0.36	-0.43	-0.25	-0.41
	(-7.10)	(-9.96)	(-2.00)	(-6.49)
Anfor				5.54
				(16.28)

Table V: Beta on ROE and Growth. The table reports the results from Fama and MacBeth (1973) univariate regressions. In each year t, univariate regressions are run of stock beta on leads and lags of return on equity (ROE) or real earnings growth (Growth). ROE is measured in periods $t+i$, with $i = -5, -3, 0, 1, 3, 5$. Growth is measured between period t and periods $t+i$, with $i = -5, -3, -1, 1, 3, 5$. For firms that are no longer in the sample in year $t+i$ (with $i > 0$), Growth is set equal to -1. Beta is computed on at least two years and at most five years of monthly returns before December of year t. For readability, the coefficients on all variables have been multiplied by 100. The reported coefficients are means of estimates from the yearly regressions. T-statistics in parentheses are computed using the standard error of the time-series mean.

	Dep. Var.: Beta			
	1929-2005	1929-1953	1954-1980	1981-2005
ROE_5	-6.96	-44.98	3.23	15.50
	(-1.58)	(-4.79)	(0.75)	(6.04)
ROE_3	-2.35	-35.61	11.90	14.18
	(-0.57)	(-4.83)	(3.95)	(2.40)
ROE	-4.23	-25.34	7.90	4.61
	(-1.29)	(-4.13)	(2.36)	(0.93)
ROE1	-7.42	-26.59	4.32	0.15
	(-2.61)	(-5.28)	(1.22)	(0.04)
ROE3	-9.87	-20.96	-4.91	-2.85
	(-4.17)	(-4.21)	(-1.53)	(-1.17)
ROE5	-10.12	-18.15	-8.98	-1.20
	(-4.35)	(-3.82)	(-2.58)	(-0.53)
Growth_5	1.14	0.54	1.68	1.08
	(5.99)	(1.26)	(5.63)	(4.65)
Growth_3	0.78	0.42	1.24	0.64
	(2.70)	(0.56)	(2.97)	(2.71)
Growth_1	0.74	0.44	1.21	0.53
	(2.25)	(0.56)	(2.39)	(1.97)
Growth1	0.40	0.25	0.52	0.42
	(1.14)	(0.32)	(0.96)	(0.89)
Growth3	-0.01	0.13	0.18	-0.40
	(-0.03)	(0.21)	(0.74)	(-1.84)
Growth5	0.09	0.53	-0.16	-0.16
	(0.46)	(1.37)	(-0.54)	(-0.73)

Table VI: Lags and Leads of ROE for BM Portfolios. Firms are sorted in December of year t using the book value and market value at the end of the year and NYSE breakpoints. Ten portfolios are formed between 1926 and 2005. For each book-to-market (BM) decile, the table reports the time-series average of portfolio return on equity (ROE) over different horizons relative to the year t of portfolio formation. ROEi is reported for the years $t+i$, with $i=-5,-3,0,1,3,5$. Portfolio ROE for year $t+i$ is computed as the average of firm level ROE in the year $t+i$ for the firms in the portfolio in year t. ROE for year $t+i$ is earnings for year $t+i$ divided by book equity in year $t+i-1$. Earnings are computed using the clean surplus identity. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order).

BM Decile:	1	2	3	4	5	6	7	8	9	10
Whole Sample: 1926-2005										
ROE_5	0.21	0.19	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.10
ROE_3	0.22	0.19	0.18	0.16	0.15	0.13	0.13	0.12	0.11	0.09
ROE	0.24	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.06	0.03
ROE1	0.36	0.21	0.17	0.14	0.12	0.10	0.08	0.06	0.03	-0.01
ROE3	0.22	0.17	0.15	0.14	0.12	0.11	0.10	0.09	0.06	0.04
ROE5	0.19	0.15	0.13	0.13	0.12	0.11	0.10	0.09	0.08	0.06
1926-1953										
ROE_5	0.21	0.16	0.12	0.12	0.10	0.09	0.08	0.07	0.06	0.04
ROE_3	0.22	0.16	0.15	0.12	0.11	0.08	0.08	0.07	0.06	0.04
ROE	0.23	0.18	0.16	0.13	0.11	0.09	0.07	0.06	0.05	0.02
ROE1	0.30	0.19	0.16	0.13	0.10	0.09	0.06	0.05	0.02	-0.01
ROE3	0.23	0.16	0.13	0.13	0.10	0.09	0.07	0.06	0.03	0.03
ROE5	0.20	0.14	0.12	0.12	0.10	0.09	0.08	0.07	0.06	0.05
1954-1980										
ROE_5	0.23	0.20	0.17	0.17	0.16	0.15	0.14	0.13	0.12	0.11
ROE_3	0.24	0.19	0.18	0.17	0.16	0.14	0.14	0.13	0.11	0.09
ROE	0.28	0.23	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05
ROE1	0.36	0.22	0.19	0.16	0.15	0.13	0.11	0.10	0.07	0.03
ROE3	0.25	0.19	0.17	0.15	0.15	0.13	0.12	0.11	0.09	0.06
ROE5	0.21	0.18	0.15	0.15	0.14	0.13	0.13	0.12	0.10	0.08
1981-2005										
ROE_5	0.20	0.21	0.20	0.18	0.18	0.18	0.17	0.16	0.16	0.16
ROE_3	0.19	0.21	0.20	0.18	0.17	0.17	0.16	0.15	0.15	0.13
ROE	0.21	0.24	0.20	0.17	0.15	0.13	0.11	0.10	0.07	0.01
ROE1	0.42	0.20	0.16	0.13	0.11	0.09	0.07	0.05	0.01	-0.05
ROE3	0.19	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.04
ROE5	0.16	0.14	0.13	0.11	0.11	0.12	0.11	0.10	0.10	0.07

Table VII: Lags and Leads of Growth for *BM* Portfolios. Firms are sorted in December of year t using the book value and market value at the end of the year and NYSE breakpoints. Ten portfolios are formed between 1926 and 2005. For each book-to-market (BM) decile, the table reports portfolio real earnings growth (Growth) over different horizons relative to the year t of portfolio formation. Growth is computed between the years t and $t+i$, with $i = -5, -3, -1, 1, 3, 5$. Firm earnings are computed using the clean surplus identity. Portfolio growth between t and $t+i$ is computed by first averaging real earnings for the firms in the portfolio, for which earnings are available in both years. Then, the portfolio earnings are further averaged over all the years t and $t+i$ in the relevant sample. Finally, portfolio growth is computed by dividing average earnings in year t by average earnings in year $t+i$, if $i < 0$, or by dividing average earnings in year $t+i$ by average earnings in year t, if $i > 0$.

BM Decile:	1	2	3	4	5	6	7	8	9	10
					Whole Sample: 1926-2005					
Growth_5	-0.02	0.00	-0.04	-0.11	-0.02	-0.09	-0.20	-0.33	-0.31	-0.43
Growth_3	-0.06	0.08	0.00	-0.04	-0.02	-0.01	-0.17	-0.22	-0.29	-0.30
Growth_1	-0.06	0.00	-0.08	-0.05	0.11	-0.01	-0.06	-0.16	-0.09	-0.14
Growth1	0.37	0.15	0.14	0.06	-0.01	0.05	-0.06	-0.01	-0.33	-0.46
Growth3	0.32	0.14	0.11	0.18	0.15	0.13	0.15	0.22	0.08	0.04
Growth5	0.43	0.31	0.22	0.22	0.23	0.26	0.42	0.38	0.22	0.40
					1926-1953					
Growth_5	-0.07	0.04	0.04	-0.06	0.60	1.89	1.07	-0.15	-0.14	1.26
Growth_3	-0.10	0.27	0.23	0.14	-0.08	0.62	-0.28	-0.10	-0.25	0.52
Growth_1	-0.11	0.00	-0.19	-0.09	0.71	0.05	-0.04	0.04	-0.29	0.24
Growth1	0.37	0.18	0.10	0.01	-0.15	-0.08	-0.13	0.00	-0.28	-0.73
Growth3	0.25	0.05	-0.05	0.27	-0.04	-0.12	0.15	0.42	0.02	0.19
Growth5	0.36	0.10	0.15	0.21	0.02	-0.15	0.21	0.66	0.71	1.43
					1954-1980					
Growth_5	0.11	-0.01	0.00	0.05	-0.02	-0.03	-0.16	-0.23	-0.20	-0.41
Growth_3	-0.03	0.00	0.01	0.04	-0.02	-0.08	-0.12	-0.19	-0.18	-0.31
Growth_1	-0.04	-0.02	-0.06	0.02	0.00	-0.03	-0.07	-0.07	-0.06	-0.11
Growth1	0.18	0.16	0.10	0.03	0.06	0.07	0.00	0.03	-0.12	-0.04
Growth3	0.26	0.29	0.13	0.14	0.14	0.15	0.13	0.21	0.11	0.17
Growth5	0.40	0.39	0.19	0.20	0.29	0.28	0.37	0.47	0.27	0.45
					1981-2005					
Growth_5	-0.11	0.08	-0.02	-0.23	-0.08	-0.22	-0.22	-0.37	-0.33	-0.51
Growth_3	-0.05	0.15	-0.05	-0.18	0.07	0.00	-0.15	-0.23	-0.34	-0.34
Growth_1	-0.04	0.04	0.02	-0.10	0.02	0.02	-0.02	-0.26	-0.05	-0.24
Growth1	0.75	0.11	0.24	0.15	-0.03	0.09	-0.09	-0.04	-0.51	-0.91
Growth3	0.52	0.00	0.23	0.14	0.35	0.31	0.21	0.22	0.13	-0.14
Growth5	0.47	0.43	0.35	0.26	0.32	0.61	0.75	0.33	0.15	0.01

Table VIII: Portfolio Level Cross-Sectional Regressions. The table reports the results from Fama and MacBeth (1973) regressions of portfolio book-to-market (BM) ratio in year t on different sets of explanatory variables for fifty BM portfolios. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The independent variables are formed from the combination of firm level characteristics. The portfolio beta is the value-weighted average of the betas of the stocks in the portfolio using market capitalization in December of year t as weights. The stock beta is computed on at least two years and at most five years of monthly returns before December of year t. Divbook is the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$. Zdiv is the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t. Repbook is the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$. ROE is the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$. Loss is the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t. Age is the average of the age of the firms in the portfolio in year t. Book is the logarithm of total book value for the firms in the portfolio in year t. Anfor is the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981. The reported coefficients are means of estimates from the yearly regressions. T-statistics (in parentheses) are computed using the standard errors of the mean. The mean R^2 of the yearly regressions is also reported. Finally, the table reports the (average) share of the variance of BM that is due to the covariance between BM and beta times the estimated slope in the regression (BSV).

Beta	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2	BSV
Whole Sample: 1929-2005										
-0.05									0.29	
(-0.23)										
-0.17	-37.97	0.33	-84.67	0.25	-8.05	0.07	-0.01		0.90	0.08
(-2.09)	(-21.24)	(3.47)	(-2.13)	(2.17)	(-8.45)	(7.15)	(-0.29)			
-0.05	-36.36	0.42	-82.50	0.24	-6.87	0.06	-0.03	-0.09	0.91	0.06
(-0.75)	(-20.84)	(4.76)	(-2.07)	(2.26)	(-6.70)	(6.30)	(-1.01)	(-12.00)		
1929-1953										
1.97									0.46	
(16.24)										
0.47	-31.87	0.77	-209.27	0.43	-3.92	0.12	0.08		0.90	0.12
(6.89)	(-14.32)	(7.83)	(-1.81)	(2.27)	(-3.93)	(4.51)	(4.66)			
1954-1980										
-0.07									0.13	
(-0.25)										
-0.25	-36.36	0.28	-27.91	-0.16	-16.02	0.04	-0.00		0.91	0.01
(-2.27)	(-11.65)	(1.55)	(-0.93)	(-0.81)	(-11.66)	(7.19)	(-0.10)			
1981-2005										
-2.06									0.29	
(-8.32)										
-0.72	-45.80	-0.04	-21.36	0.50	-3.56	0.06	-0.10		0.87	0.10
(-5.80)	(-14.08)	(-0.26)	(-4.13)	(2.83)	(-3.19)	(5.33)	(-1.45)			
-0.35	-40.86	0.22	-14.69	0.49	0.06	0.03	-0.16	-0.09	0.90	0.05
(-3.71)	(-11.96)	(1.55)	(-3.17)	(3.43)	(0.06)	(3.92)	(-2.60)	(-12.00)		

Table IX: Correlation Among Different Risk Measures. The table reports the correlation coefficients among the loadings on different risk factors for fifty book-to-market (BM) portfolios. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. The portfolio measure of risk is the capitalization-weighted average of the risk measures of the stocks in the portfolio, where they are available. The stock risk loadings are computed on at least twenty-four and at most sixty months of data prior to December of year t. The measures of risk are: the slope in a univariate regression on the excess market return (Beta); the loadings on Fama and French's (1993) three factors: the excess return on the market (Lmkt), the return on HML (Lhml), and the return on SMB (Lsmb); the stock's bad beta and good beta, which are available up to 2001 (Campbell and Vuolteenaho (2004)); the consumption betas (Cbeta), which are computed as in Bansal, Dittmar, and Lundblad (2005), and are available from 1967.

	Beta	Lmkt	Lhml	Lsmb	Bad Beta	Good Beta
				1930-2001		
Beta	1.00					
Lmkt	0.65	1.00				
Lhml	0.15	0.14	1.00			
Lsmb	0.34	0.10	0.22	1.00		
Bad Beta	0.50	0.27	0.40	0.09	1.00	
Good Beta	0.86	0.59	-0.08	0.31	0.02	1.00
				1967-2001		
Beta	1.00					
Lmkt	0.61	1.00				
Lhml	-0.41	0.17	1.00			
Lsmb	0.42	0.19	0.15	1.00		
Bad Beta	0.02	0.25	0.42	-0.02	1.00	
Good Beta	0.93	0.47	-0.54	0.37	-0.33	1.00
Cbeta	0.13	0.11	0.24	0.24	0.18	0.04

Table X: Cross-Sectional Regressions With Other Measures of Risk. The table reports the results from Fama and MacBeth (1973) regressions of portfolio book-to-market (BM) ratio in year t on alternative measures of risk and other explanatory variables for fifty BM portfolios. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The independent variables are formed from the combination of firm level characteristics. The portfolio measure of risk is the value-weighted average of the risk measures of the stocks in the portfolio using market capitalization in December of year t as weights. The stock risk loadings are computed on at least twenty-four and at most sixty months of data prior to December of year t. Divbook is the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$. Zdiv is the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t. Repbook is the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$. ROE is the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$. Loss is the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t. Age is the average of the age of the firms in the portfolio in year t. Book is the logarithm of total book value for the firms in the portfolio in year t. Anfor is the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981. In Panel A, the portfolio measures of risk are the capitalization-weighted average of the stock loadings on Fama and French's (1993) three factors: the excess return on the market (Lmkt), the return on HML (Lhml), and the return on SMB (Lsmb). In Panel B, the portfolio measures of risk are the capitalization-weighted average of the stock's bad beta and good beta, which are available up to 2001 (Campbell and Vuolteenaho (2004)). In Panel C, the portfolio measures of risk are the capitalization-weighted average of the stock consumption betas (Cbeta), which are computed as in Bansal, Dittmar, and Lundblad (2005). The reported coefficients are means of estimates from the yearly regressions. T-statistics (in parentheses) are computed using the standard errors of the mean. The mean R^2 of the yearly regressions is also reported. The table also reports the (average) share of the variance of BM that is due to the covariance between BM and the risk loadings times their estimated slopes in the regression (BSV).

Panel A: Three-Factor Model												
Lmkt	Lhml	Lsmb	Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2	BSV
1929-2005												
-0.08	1.31	0.25									0.75	
(-0.81)	(30.06)	(3.15)										
-0.10	0.56	0.21	-30.06	0.21	-82.17	0.21	-3.06	0.04	0.02	-0.07	0.94	0.32
(-2.02)	(17.81)	(5.71)	(-20.21)	(2.80)	(-2.35)	(2.44)	(-4.27)	(5.06)	(1.08)	(-8.50)		
1981-2005												
-0.34	1.25	-0.05									0.64	
(-1.48)	(13.02)	(-0.27)										
-0.21	0.49	0.17	-33.88	0.17	-14.28	0.36	1.10	0.01	-0.07	-0.07	0.92	0.24
(-2.13)	(7.70)	(2.09)	(-10.25)	(1.13)	(-2.97)	(2.80)	(1.22)	(1.68)	(-1.19)	(-8.50)		
Panel B: Bad Beta, Good Beta												
Bad Beta	Good Beta		Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2	BSV
1930-2001												
5.13	-0.56										0.48	
(9.15)	(-2.35)											
0.77	-0.13		-34.95	0.44	-88.31	0.19	-6.71	0.06	-0.02	-0.08	0.92	0.11
(3.58)	(-1.32)		(-19.58)	(5.12)	(-2.07)	(1.77)	(-6.53)	(5.94)	(-0.95)	(-9.17)		
1981-2001												
3.36	-2.53										0.45	
(2.42)	(-8.21)											
0.55	-0.54		-41.24	0.15	-13.40	0.54	0.30	0.04	-0.18	-0.08	0.93	0.09
(1.19)	(-4.43)		(-10.65)	(1.00)	(-2.42)	(3.53)	(0.28)	(4.77)	(-2.48)	(-9.17)		
Panel C: Consumption Beta												
Cbeta			Divbook	Zdiv	Repbook	Loss	ROE	Age	Book	Anfor	R^2	BSV
1967-2005												
0.03											0.11	
(3.03)												
0.00			-32.91	0.20	-21.71	0.16	-6.81	0.05	-0.11	-0.10	0.90	0.02
(0.90)			(-12.86)	(1.46)	(-1.61)	(1.16)	(-3.68)	(6.75)	(-2.53)	(-12.70)		
1981-2005												
0.00											0.08	
(0.37)												
-0.00			-37.87	0.19	-19.91	0.43	0.14	0.04	-0.19	-0.10	0.90	0.02
(-0.21)			(-12.45)	(1.24)	(-4.62)	(2.96)	(0.12)	(4.23)	(-2.98)	(-12.70)		

Table XI: BM and Residual BM portfolios. The table reports summary statistics and estimated alphas and betas for book-to-market (BM) and residual BM (BMres) portfolios. BM is defined as the ratio of book value of equity in December of year $t-1$ to market capitalization in December of year $t-1$. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order). Residual BM for each firm is the residual from the cross-sectional regression of (the log of) BM in year $t-1$ on a number of independent variables in year $t-1$. The independent variables are: the ratio of total dividends in year $t-1$ to book value at the end of year $t-1$ (Divbook), a dummy variable, which equals one for firms paying zero dividends in year $t-1$ (Zdiv), the ratio of share repurchases in year $t-1$ to book value at the end of year $t-1$ (Repbook), the return on equity (ROE), a dummy variable, which equals one for firms with negative earnings in year $t-1$ (Loss), firm's age (Age), the logarithm of book value in year $t-1$ (Book), and the median analyst forecast of long run growth in percent (Anfor), which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years $t-1$, $t-2$, and $t-3$. In July of year t, ten value-weighted portfolios are formed based on the deciles of the distribution of BM or BMres in December of the previous year and they are held up to June of year $t+1$. Panel A reports means and standard deviations of the monthly returns on these portfolios. Panel B reports alphas and betas from the time-series regressions of portfolio monthly returns in excess of the T-Bill monthly rate on the excess return of the CRSP value-weighted market index. The last column of the table considers a portfolio that is long in the tenth decile portfolio and short in the first decile portfolio for both BM and BMres. T-statistics are reported in parentheses.

Panel A: Summary Statistics											
Decile:	1	2	3	4	5	6	7	8	9	10	(10 - 1)
	Whole Sample: July, 1930 - December, 2005										
Mean BM	0.88	0.99	0.93	0.97	1.08	1.07	1.17	1.32	1.27	1.53	0.65
S.d. BM	5.75	5.59	5.40	6.30	5.74	6.51	6.84	7.40	7.76	9.70	6.85
Mean BMres	0.84	0.93	1.11	1.02	1.11	0.99	1.27	1.17	1.23	1.23	0.39
S.d. BMres	5.94	5.25	5.91	5.75	5.89	5.98	6.90	6.94	7.20	8.01	5.19
	July, 1963 - December, 2005										
Mean BM	0.88	1.00	0.99	0.99	1.12	1.15	1.15	1.26	1.22	1.50	0.62
S.d. BM	5.06	4.83	4.69	4.67	4.54	4.43	4.51	4.55	4.69	5.56	4.63
Mean BMres	0.90	1.01	1.07	0.97	1.16	1.06	1.10	1.19	1.20	1.22	0.32
S.d. BMres	5.10	4.70	4.83	4.63	4.55	4.32	4.50	4.48	4.59	5.35	4.21
Panel B: Alpha and Beta											
Decile:	1	2	3	4	5	6	7	8	9	10	(10 - 1)
	Whole Sample: July, 1930 - December, 2005										
Alpha BM	-0.06	0.06	0.03	-0.02	0.16	0.07	0.14	0.23	0.17	0.27	0.33
	(-1.03)	(1.08)	(0.52)	(-0.30)	(2.24)	(0.77)	(1.51)	(2.20)	(1.39)	(1.55)	(1.58)
Alpha BMres	-0.12	0.04	0.15	0.07	0.15	0.04	0.23	0.14	0.18	0.11	0.22
	(-1.84)	(0.76)	(2.56)	(1.27)	(2.44)	(0.48)	(2.39)	(1.38)	(1.63)	(0.82)	(1.34)
Beta BM	1.00	0.99	0.95	1.08	0.99	1.10	1.15	1.23	1.26	1.51	0.50
	(89.19)	(103.51)	(93.68)	(78.02)	(77.54)	(68.53)	(67.36)	(63.18)	(56.93)	(47.41)	(13.13)
Beta BMres	1.04	0.92	1.04	1.01	1.03	1.02	1.15	1.16	1.18	1.29	0.26
	(88.45)	(92.44)	(97.76)	(96.94)	(92.21)	(75.38)	(65.31)	(63.94)	(58.22)	(54.55)	(8.38)
	July, 1963 - December, 2005										
Alpha BM	-0.08	0.04	0.05	0.07	0.21	0.27	0.26	0.38	0.33	0.56	0.64
	(-0.91)	(0.58)	(0.71)	(0.82)	(2.41)	(2.80)	(2.67)	(3.64)	(2.91)	(3.75)	(3.11)
Alpha BMres	-0.07	0.07	0.12	0.05	0.24	0.18	0.22	0.31	0.32	0.26	0.33
	(-0.75)	(1.02)	(1.51)	(0.60)	(2.99)	(2.02)	(2.19)	(3.06)	(2.85)	(2.11)	(1.77)
Beta BM	1.05	1.04	1.00	0.96	0.93	0.87	0.89	0.89	0.89	1.01	-0.04
	(52.44)	(66.13)	(61.71)	(49.48)	(46.30)	(39.84)	(40.70)	(38.16)	(34.91)	(30.13)	(-0.94)
Beta BMres	1.06	1.00	1.02	0.97	0.94	0.86	0.88	0.88	0.87	1.03	-0.03
	(51.83)	(62.71)	(56.35)	(56.09)	(51.50)	(42.29)	(39.35)	(38.83)	(34.33)	(36.74)	(-0.65)

Figure 1: The Beta of the Value Portfolio. The figure plots the series of estimated betas for the tenth book-to-market (BM) decile portfolio. Betas are estimated on portfolio excess returns using sixty months rolling windows. The estimation window moves forward by one month. The first estimation window is July 1926 to June 1931, the last is January 2001 to December 2005. The end date of the estimation window is reported on the horizontal axis. Value-weighted portfolios are formed in July of year t based on the breakpoints of the distribution of BM in December of year $t-1$. BM is book value in year $t-1$ divided by market capitalization in December of year $t-1$. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order).

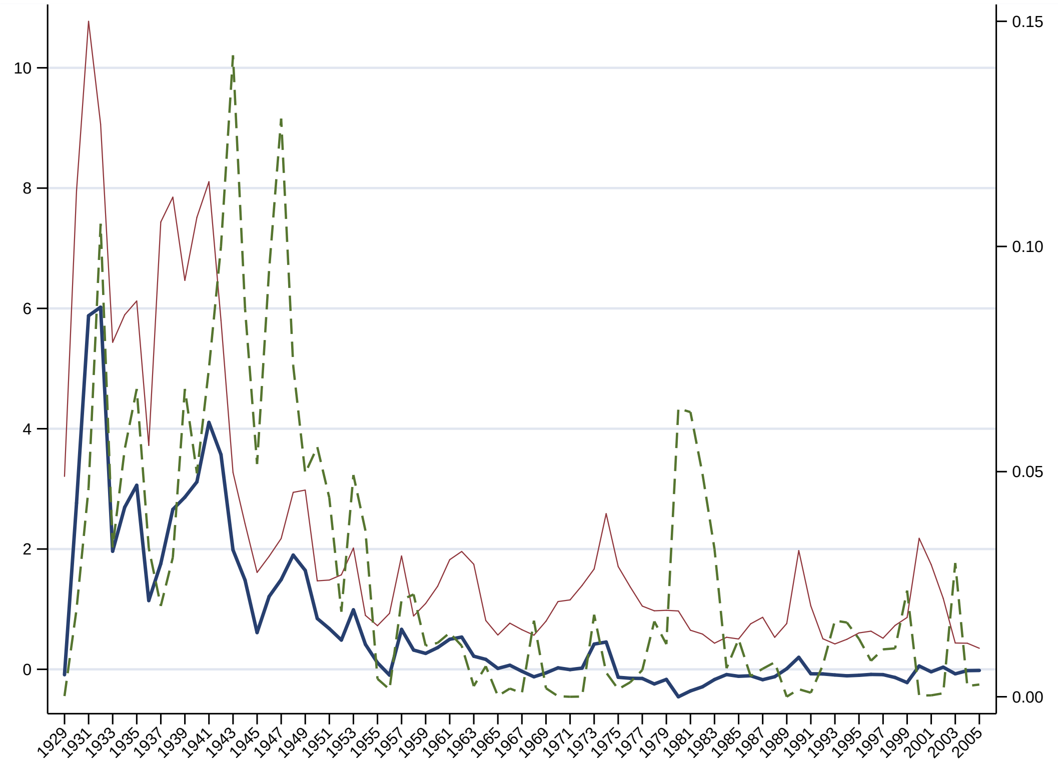

Figure 2: Univariate Regressions. The figure plots estimated slopes, residual volatility, and R^2 from the univariate cross-sectional regression of BM on betas in year t. The thick solid line is the slope on beta. The thin solid line is the square root of the mean squared residuals. Both series are plotted on the left vertical axis. The dashed line is the R^2 in the regressions and it is plotted on the right axis. The book-to-market (BM) ratio is computed as book value in fiscal year t divided by market capitalization in December of year t. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order). Beta is computed on at least two years and at most five years of monthly returns before December of year t.

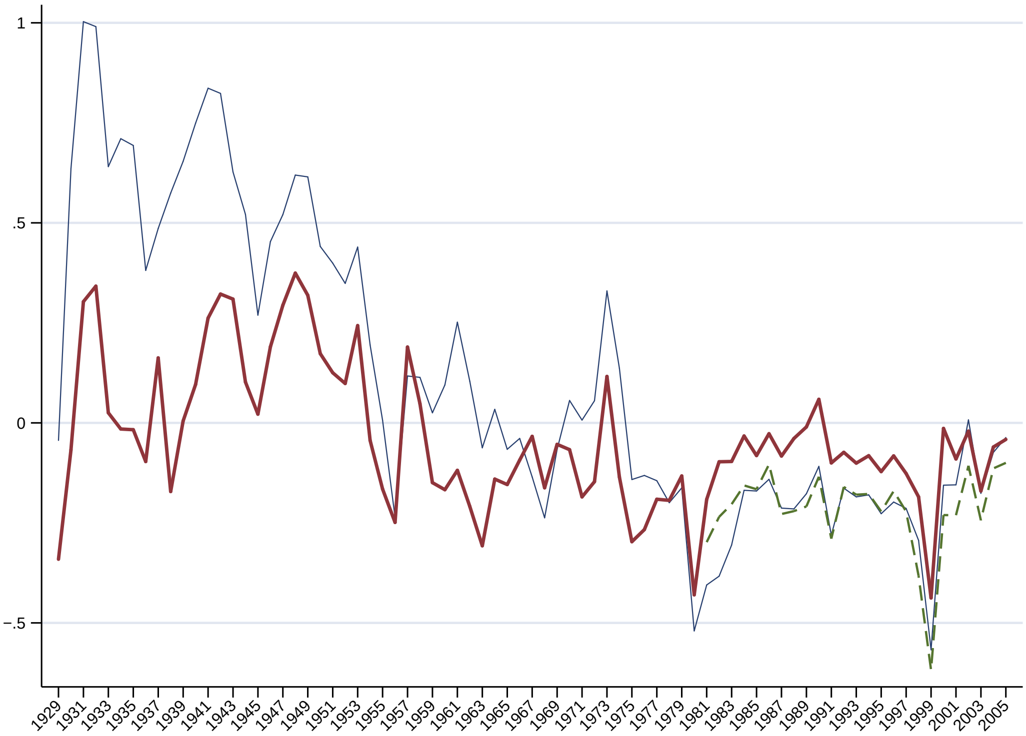

Figure 3: Cross-Sectional Slope On Beta Over Time. The figure plots the series of estimated coefficients on the independent variable beta in cross-sectional univariate and multivariate yearly regressions at firm level, where the log of firm book-to-market (BM) is the dependent variable. The thin solid line is the slope from univariate regressions of the log of BM on beta. The thick solid line is the slope on beta in multivariate regressions that from 1981 include analyst forecasts. The dashed line is the slope on beta in multivariate regressions that exclude analyst forecasts. In all the regressions, the independent variable beta is computed on at least two years and at most five years of monthly returns before December of year t. In the multivariate regressions, the other regressors are: the ratio of total dividends in year t to book value at the end of year t (Divbook); a dummy variable, which equals one for firms paying zero dividends in year t; the ratio of share repurchases in year t to book value at the end of year t (Repbook); the return on equity (ROE); a dummy variable, which equals one for firms with negative earnings in year t; firm's age; the logarithm of book value in year t; and the median analyst forecast of long run growth in percent, which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$.

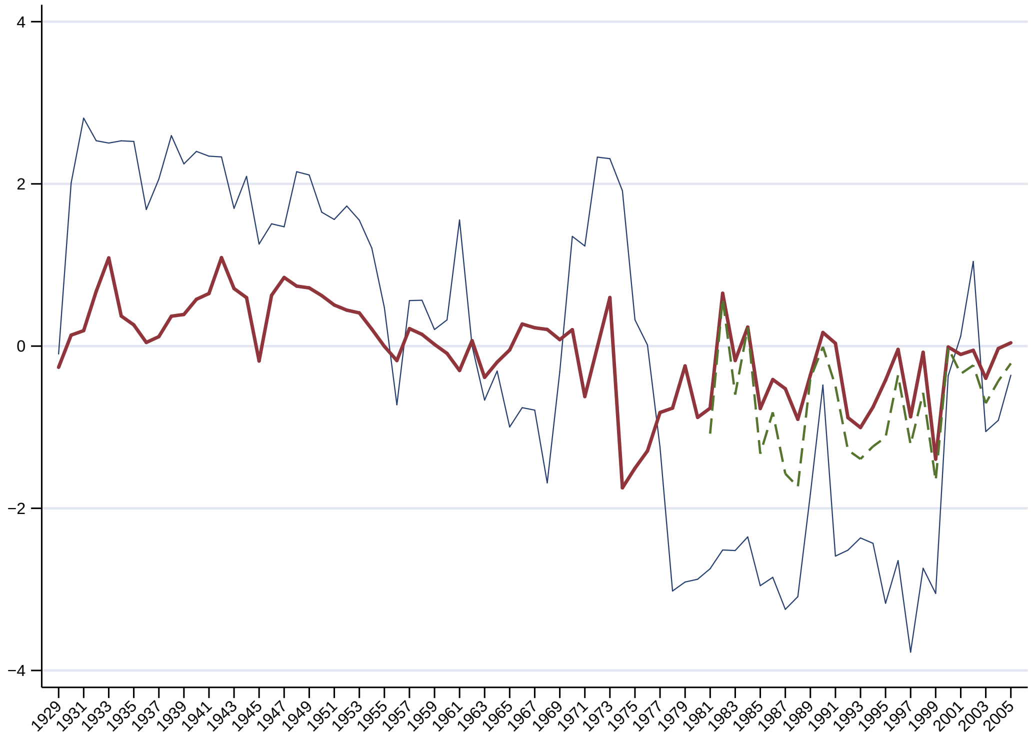

Figure 4: Cross-Sectional Slope On Beta Over Time (Portfolios). The figure plots the series of estimated coefficients on the independent variable beta in cross-sectional univariate and multivariate yearly regressions at portfolio level, where the log of portfolio book-to-market (BM) is the dependent variable. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The thin solid line is the slope from univariate regressions of the log of BM on portfolio beta. The thick solid line is the slope on beta in multivariate regressions that from 1981 include analyst forecasts. The dashed line is the slope on beta in multivariate regressions that exclude analyst forecasts. In all the regressions, the independent variable beta is the capitalization-weighted average of stock betas, which are computed on at least two years and at most five years of monthly returns before December of year t. In the multivariate regressions, the other regressors are: Divbook, the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; Zdiv, the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t; Repbook, the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; ROE, the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$; Loss, the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t; Age, the average of the age of the firms in the portfolio in year t; Book, the logarithm of total book value for the firms in the portfolio in year t; Anfor, the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

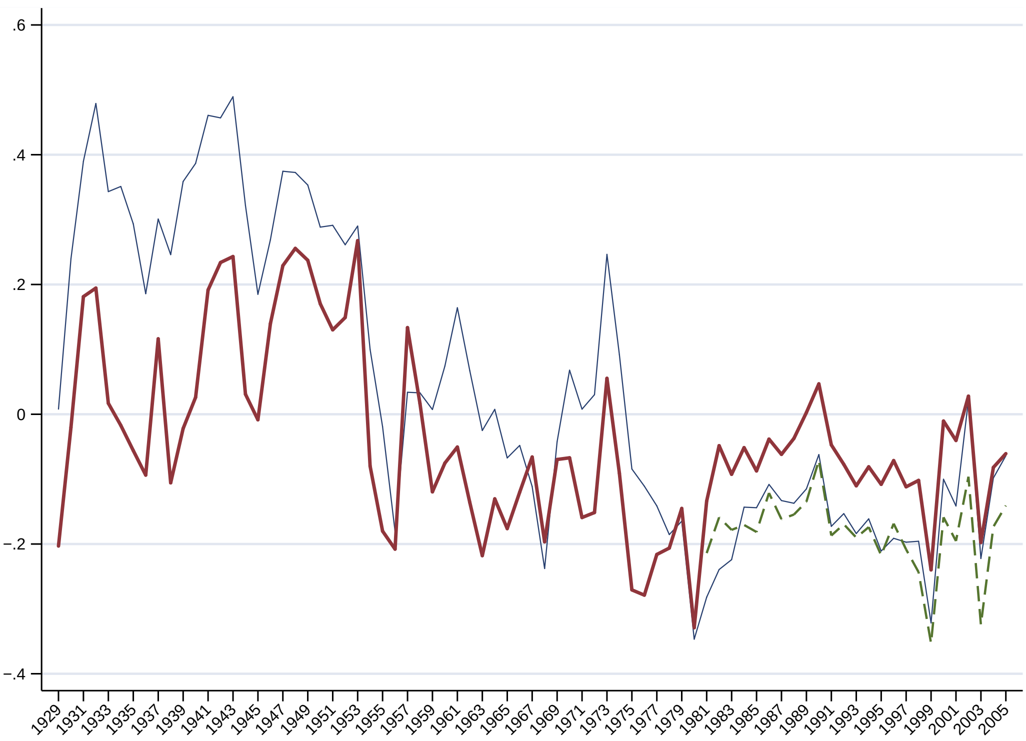

Figure 5: Rank Correlation Between Beta and BM**.** The figure plots the series of annual Spearman correlation coefficients between stock beta and firm book-to-market (BM), or residual BM. The thin solid line is the correlation between the log of BM and stock beta. The thick solid line is the correlation between beta and the residuals from multivariate regressions of the log of BM on a set of regressors that from 1981 include analyst forecasts. The dashed line is the correlation between beta and the residuals from multivariate regressions of the log of BM on a set of regressors that exclude analyst forecasts. Beta is computed on at least two years and at most five years of monthly returns before December of year t. In the multivariate regressions, the regressors are: the ratio of total dividends in year t to book value at the end of year t (Divbook); a dummy variable, which equals one for firms paying zero dividends in year t; the ratio of share repurchases in year t to book value at the end of year t (Repbook); the return on equity (ROE); a dummy variable, which equals one for firms with negative earnings in year t; firm's age; the logarithm of book value in year t; and the median analyst forecast of long run growth in percent, which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years t, $t-1$, and $t-2$.

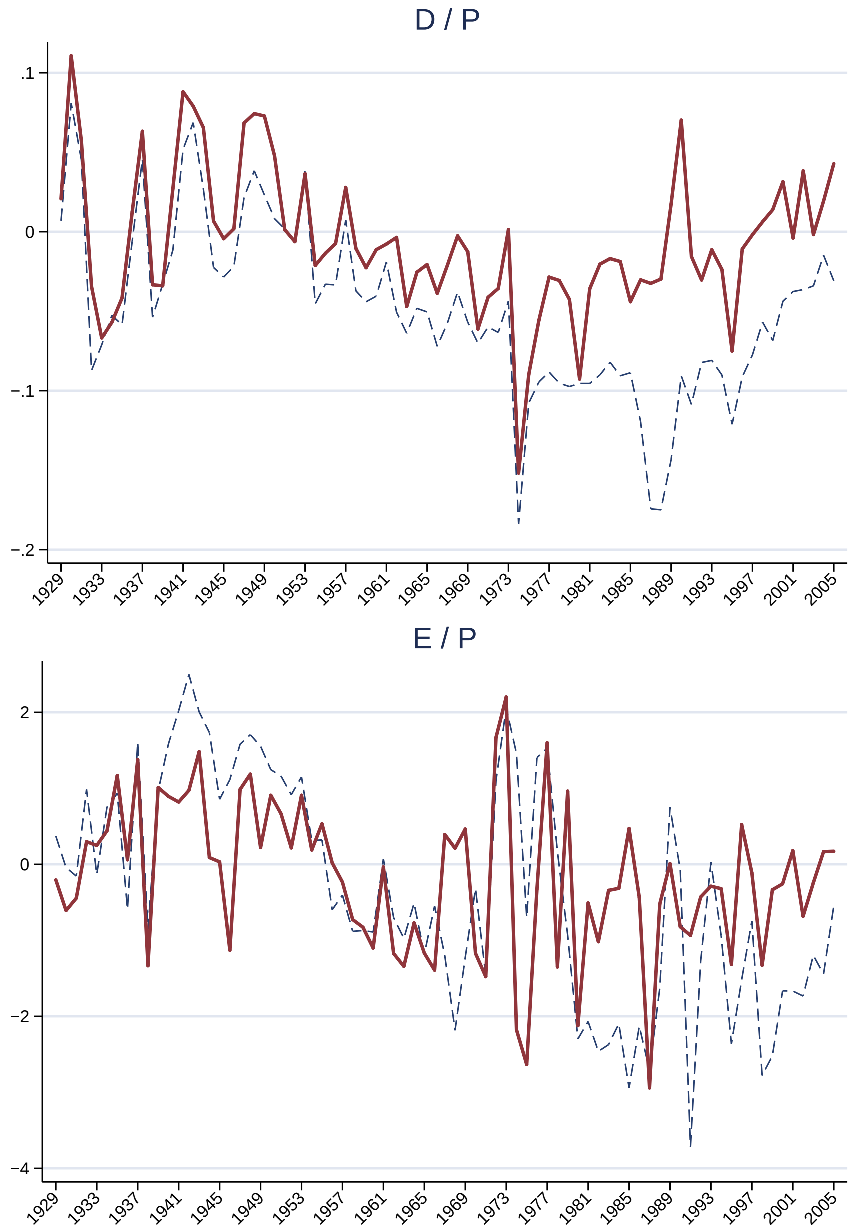

Figure 6: Cross-Sectional Slope On Beta Over Time (D/P and E/P). Each of the two figures plots the series of estimated coefficients on the independent variable beta in cross-sectional univariate and multivariate yearly regressions at portfolio level. The dependent variables are either the log of portfolio dividend-to-price ratio (D/P, top graph) or the log of portfolio earnings-to-price ratio (E/P, bottom graph). Firms with zero dividends or negative earnings are excluded from the analysis. Firms are sorted in December of year t using total dividends (or total earnings) and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio D/P (or E/P) is the ratio of the total dividends (or earnings) for the firms in the portfolio to total portfolio capitalization. The dashed line is the slope from univariate regressions of either portfolio D/P (or E/P) on portfolio beta. The solid line is the slope on beta in multivariate regressions that from 1981 include analyst forecasts. In all the regressions, the independent variable beta is the capitalization-weighted average of stock betas, which are computed on at least two years and at most five years of monthly returns before December of year t. In the multivariate regressions, the other regressors are (where applicable): Divbook, the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; Zdiv, the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t; Repbook, the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; ROE, the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$; Loss, the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t; Age, the average of the age of the firms in the portfolio in year t; Book, the logarithm of total book value for the firms in the portfolio in year t; Anfor, the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

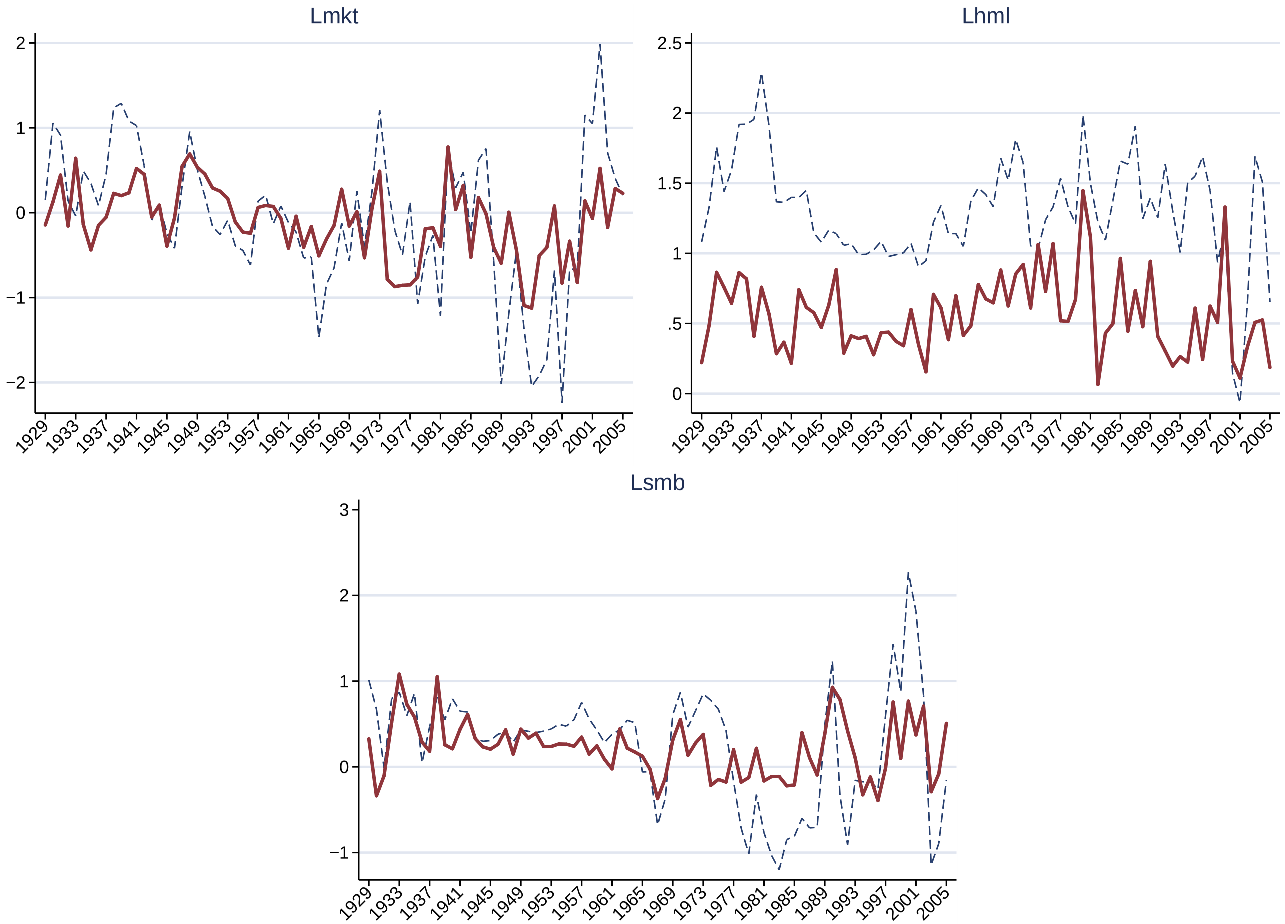

Figure 7: Cross-Sectional Slopes on the Three-Factor Loadings Over Time. Each of the three graphs plots the series of estimated coefficients on one of the loadings on the Fama and French (1993) three factors from cross-sectional yearly regressions at portfolio level, where the log of portfolio book-to-market (BM) is the dependent variable. The three factor loadings are: the loading on the excess market return (Lmkt), the loading on HML (Lhml), and the loading on SMB (Lsmb). Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The dashed line is the slope on one of the three loadings from the regressions of the log of portfolio BM on just the three factor loadings for the portfolios. The solid line is the slope on one of the loadings in regressions that also include other portfolio characteristics. The portfolio factor loadings are the capitalization-weighted average of stock factor loadings, which are computed on at least two years and at most five years of monthly returns before December of year t. Where included in the cross-sectional regressions, the other regressors are: Divbook, the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; Zdiv, the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t; Repbook, the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; ROE, the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$; Loss, the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t; Age, the average of the age of the firms in the portfolio in year t; Book, the logarithm of total book value for the firms in the portfolio in year t; Anfor, the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

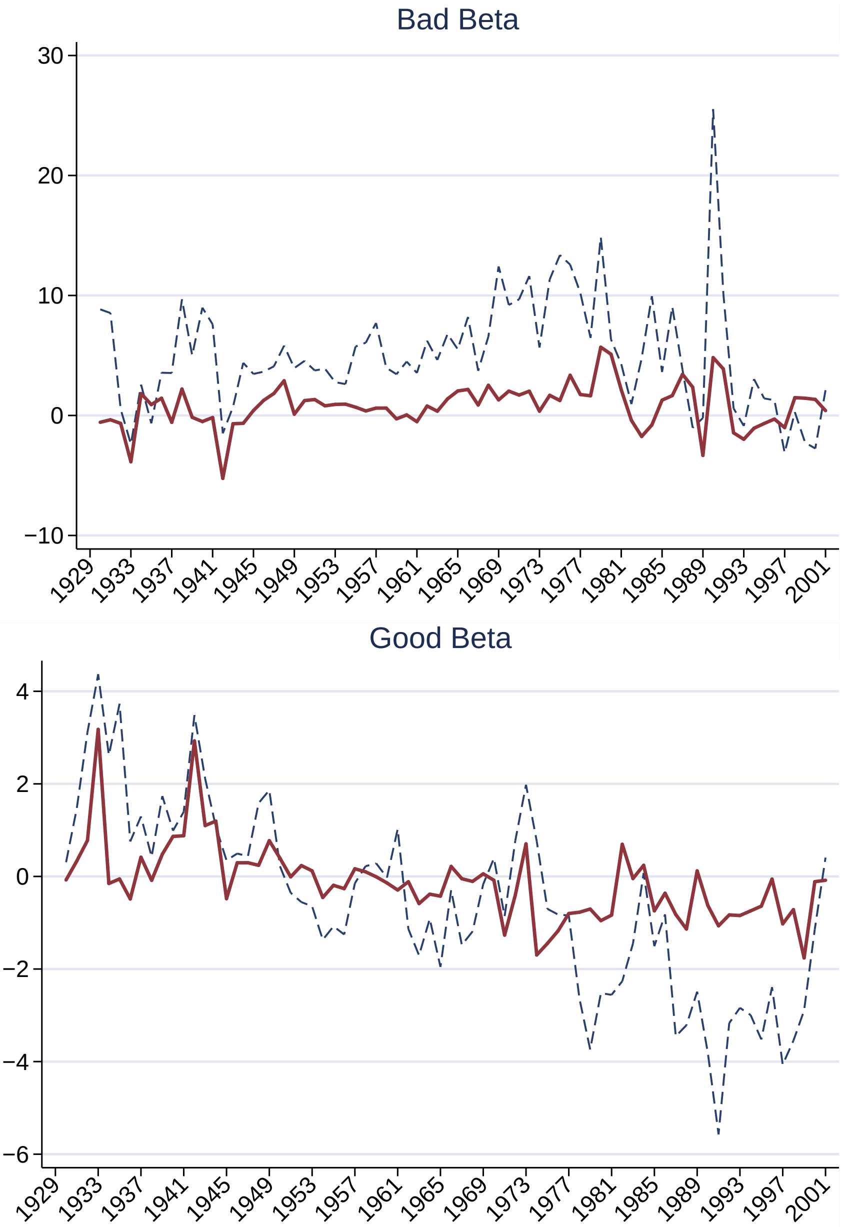

Figure 8: Cross-Sectional Slopes on Bad Beta and Good Beta Over Time. The two graphs plot the series of estimated coefficients on Campbell and Vuolteenaho's (2004) bad beta (top graph) and good beta (bottom graph) from cross-sectional yearly regressions at portfolio level, where the log of portfolio book-to-market (BM) is the dependent variable. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The dashed line is the slope on either type of beta from the regressions of the log of portfolio BM on just the two betas for the portfolios. The solid line is the slope on one of the betas in regressions that also include other portfolio characteristics. The portfolio betas are the capitalization-weighted average of stock betas, which are computed on at least two years and at most five years of monthly returns before December of year t. Where included in the cross-sectional regressions, the other regressors are: Divbook, the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; Zdiv, the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t; Repbook, the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; ROE, the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$; Loss, the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t; Age, the average of the age of the firms in the portfolio in year t; Book, the logarithm of total book value for the firms in the portfolio in year t; Anfor, the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

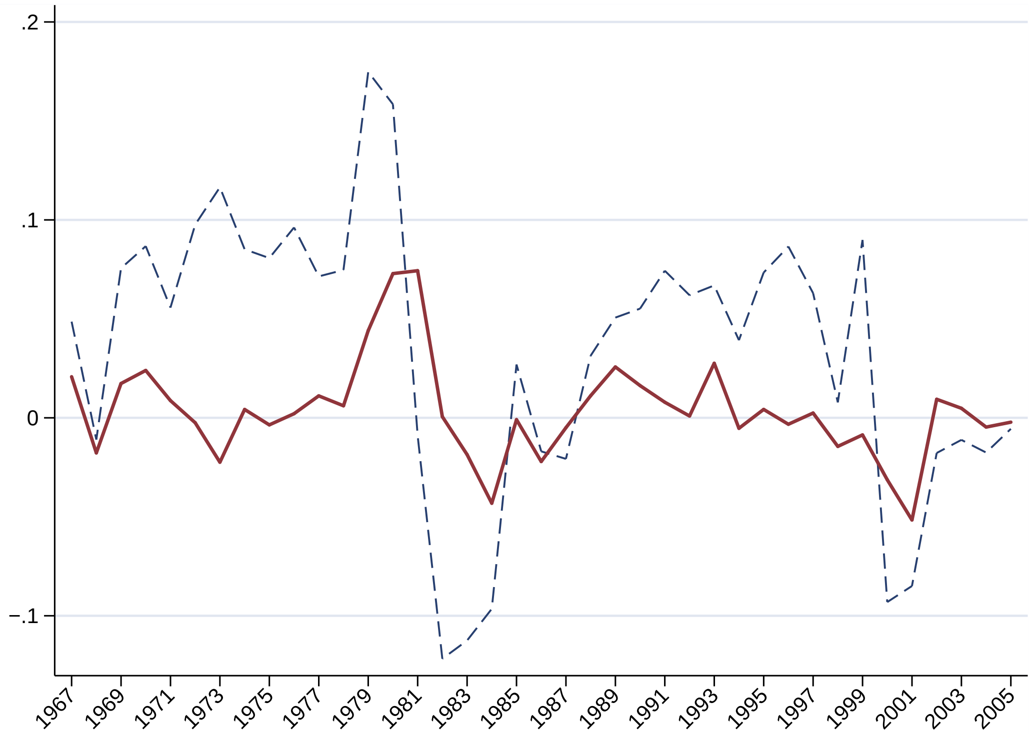

Figure 9: Cross-Sectional Slope on Consumption Beta Over Time. The graph plots the series of estimated coefficients on the consumption beta from cross-sectional yearly regressions at portfolio level, where the log of portfolio book-to-market (BM) is the dependent variable. Firms are sorted in December of year t using the book value and market value at the end of the year. Fifty portfolios are formed between 1929 and 2005. Portfolio BM is the ratio of the total book value of the firms in the portfolio to total portfolio capitalization. The dashed line is the slope on the consumption beta from the univariate regressions of the log of portfolio BM on portfolio beta. The solid line is the slope on beta in regressions that also include other portfolio characteristics. The portfolio betas are the capitalization-weighted average of stock consumption betas, which are computed on at least two years and at most five years of monthly returns before December of year t. The consumption beta is computed as in Bansal, Dittmar, and Lundblad (2005). Where included in the cross-sectional regressions, the other regressors are: Divbook, the ratio of total dividends for the firms in the portfolio in year t, which were paid over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; Zdiv, the capitalization weighted average of a firm level dummy variable, which equals one for firms paying zero dividends in year t; Repbook, the ratio of total share repurchases for the firms in the portfolio in year t, which occurred over the years $t, t-1$, and $t-2$, to total book value for the same firms at the end of the years $t, t-1$, and $t-2$; ROE, the ratio of total earnings for the firms in the portfolio in year t summed over the years $t, t-1$, and $t-2$ to total book value for the same firms at the end of the years $t-1, t-2$, and $t-3$; Loss, the capitalization-weighted average of a firm level dummy variable, which equals one for firms with negative earnings in year t; Age, the average of the age of the firms in the portfolio in year t; Book, the logarithm of total book value for the firms in the portfolio in year t; Anfor, the capitalization-weighted average of the firm level median analyst forecast of long run growth, which is available from IBES since 1981.

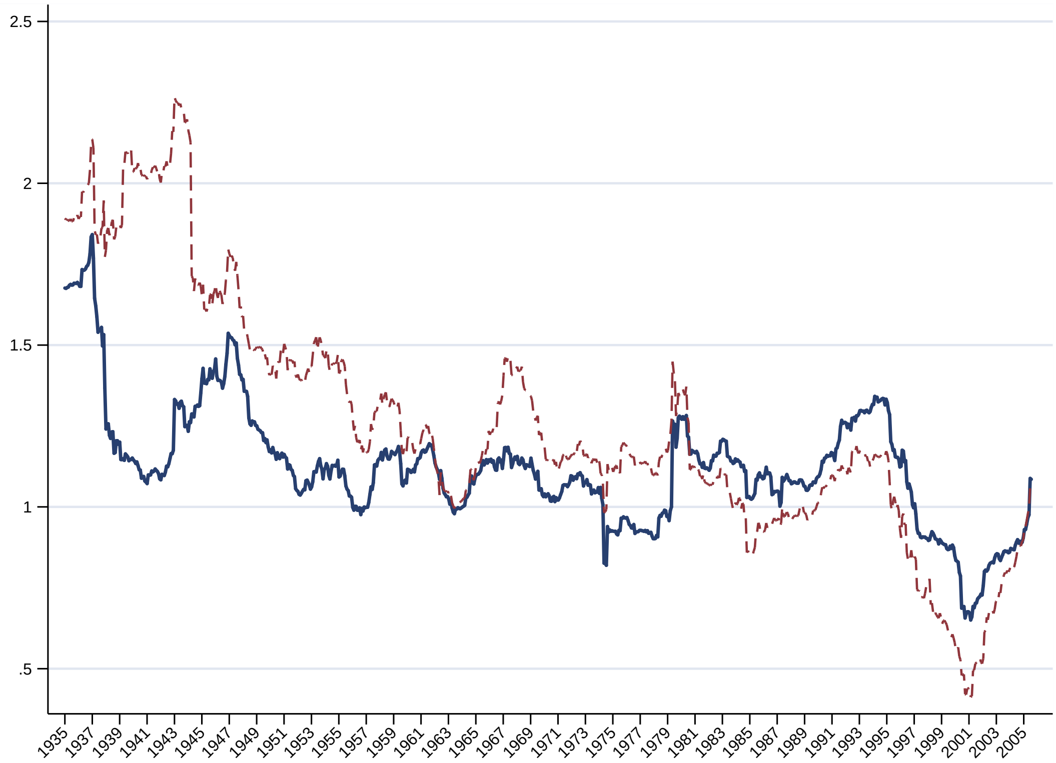

Figure 10: The Betas Of the High BM and High Residual BM Portfolios. The figure plots the series of estimated betas for the tenth book-to-market (BM) decile portfolio (dashed lined) and for the tenth residual BM decile portfolio (solid line). Betas are estimated on portfolio excess returns using sixty months rolling windows. The estimation window moves forward by one month. The first estimation window is July 1930 to June 1935, the last is January 2001 to December 2005. The end date of the estimation window is reported on the horizontal axis. Value-weighted portfolios are formed in July of year t based on the breakpoints of the distribution of BM, or residual BM, in December of year $t-1$. BM is defined as the ratio of book value of equity in December of year $t-1$ to market capitalization in December of year $t-1$. Book value is the stockholders' book equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, it is book value of common equity plus the par value of preferred stock, or the book value of assets minus total liabilities (in that order). Residual BM for each firm is the residual from the cross-sectional regression of (the log of) BM in year $t-1$ on a number of independent variables in year $t-1$. The independent variables are: the ratio of total dividends in year $t-1$ to book value at the end of year $t-1$ (Divbook), a dummy variable, which equals one for firms paying zero dividends in year $t-1$, the ratio of share repurchases in year $t-1$ to book value at the end of year $t-1$ (Repbook), the return on equity (ROE), a dummy variable, which equals one for firms with negative earnings in year $t-1$, firm's age, the logarithm of book value in year $t-1$, and the median analyst forecast of long run growth in percent, which is available from IBES since 1981. The values of the regressors ROE, Divbook, and Repbook are averaged over the years $t-1$, $t-2$, and $t-3$.