Catering to Characteristics*

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Abstract

When investors overvalue a particular firm characteristic, corporations endowed with that characteristic can absorb some of the demand by issuing equity. We use time-series variation in differences between the attributes of stock issuers and repurchasers to shed light on characteristic-related mispricing. During years when issuing firms are large relative to repurchasing firms, for example, we show that large firms subsequently underperform. This holds true even when we restrict attention to the returns of firms that do not issue at all, suggesting that issuance is partly an attempt to cater to broad time-varying patterns in characteristics mispricing. Our approach helps forecast returns to portfolios based on book-to-market (HML), size (SMB), price, distress, payout policy, profitability, and industry. Our results are consistent with the view that firms play an important role as arbitrageurs in the stock market.

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I. Introduction

It is well known that firms that issue stock earn low subsequent returns on average. Loughran and Ritter (1995) find that firms issuing equity in either an IPO or a SEO underperform significantly post offering. Loughran and Vijh (1997) show that acquirers in stock-financed mergers later underperform. Conversely, Ikenberry, Lakonishok and Vermaelen (1995) find that firms repurchasing shares have abnormally high returns. Fama and French (2008a) and Pontiff and Woodgate (2008) synthesize these results using a composite measure of net stock issuance: they show that the change in split-adjusted shares outstanding is a strong negative predictor of returns in the cross-section.

A reasonable and widely accepted interpretation of these facts is that firms exploit private information about future stock returns to minimize the total cost of financing. Where does this informational advantage come from? One view is that managers who know that their firm is overvalued issue shares to investors who in turn are overly optimistic about the firm's future performance. As Loughran and Ritter (1995) put it, "firms take advantage of transitory windows of opportunity by issuing equity when, on average, they are substantially overvalued." This interpretation receives support in Graham and Harvey's (2001) survey of CFOs: 67 percent claim that the "the amount by which our stock is undervalued or overvalued by the market" influences whether the firm issues equity.

An alternate and yet complementary interpretation of these results is that firms cater their issuance to time-varying investor demand for specific characteristics. Under this interpretation, managers do not have private information about the future stock market performance of their particular firm per se. They do, however, observe demand for their characteristics and adjust their capital structure to accommodate this demand. Relative to professional arbitrageurs, firms are advantaged in undertaking such trades when mispricing converges slowly or is associated with undiversifiable risk (e.g., Shleifer and Vishny 1997; Stein 2005).

In this paper, we show that firms cater to time varying demand for characteristics by issuing prior to periods in which their characteristics perform poorly, and repurchasing prior to periods when their characteristics perform well. Our empirical design relies on two assumptions. First, firm characteristics – such as having a high book-to-market ratio, high sales growth, paying a dividend, or being in a particular industry – may be mispriced. This assumption receives considerable support in the vast literature on the cross-section of stock returns (e.g., Daniel and Titman 1997). Second, characteristic-based mispricing varies over time. For example, one might suppose that the attribute of having a ".com" name was overvalued in 1999, but perhaps not in 2001. Together, these assumptions amount to saying that stock returns can be described by a *conditional characteristics* model. Less formally, investor sentiment is associated with different themes during different periods.

How should firms respond to characteristic mispricing? Firms endowed with an overpriced characteristic can absorb excess investor demand by either selling new shares or undertaking stock-financed acquisitions. This activity advantages the firms' existing long-term shareholders at the expense of short-term investors who temporarily demand the characteristic. Likewise, private firms with a characteristic that is favored by investors may choose to go public. Last, firms endowed with an underpriced characteristic may repurchase existing shares or potentially even go private via a buyout transaction. Following this logic, differences between the attributes of recent issuers and repurchasers can be used to infer which characteristics are mispriced at any point in time. So, if we were to observe that recent issuers were predominately firms with characteristic X and recent repurchasers were predominately firms with characteristic

Y, we might reasonably infer that characteristic *X* was overvalued, while characteristic *Y* was undervalued.

Our empirical strategy closely follows the above intuition. Focusing on firm attributes identified by previous work, we use differences between the characteristics of recent issuers and repurchasers – which we call "issuer-repurchaser spreads" – to forecast returns to long-short portfolios associated with these characteristics. Specifically, following periods in which issuing firms have particularly high values of a characteristic compared to repurchasing firms, we would expect the long-short portfolio associated with that characteristic to perform poorly. Which firm attributes? Although in principle our approach could be applied to understanding the mispricing of *any* characteristic, we limit ourselves to traits which have been emphasized in previous work and, more importantly, can be measured reliably in the data since the 1960s: book-to-market, sales growth, accruals, size, nominal share price, age, beta, volatility, distress (bankruptcy hazard rate), dividend policy, profitability, and industry. In selecting these characteristics, we hope to capture some of the salient dimensions along which investors categorize, and thus potentially misvalue, stocks.[1]

In our baseline results, characteristic issuer-repurchaser spreads significantly forecast characteristics-based returns in six cases: book-to-market, size, nominal share price, distress, payout policy, profitability, and industry. For the remaining characteristics, the issuer-repurchaser spread forecasts returns negatively, albeit with reduced statistical significance. Our measures help forecast factors associated with size (SMB) and book-to-market (HML).

[1] Among the characteristics listed above, book-to-market, size, nominal share price, and dividend payout policy stand out as being most relevant from the perspective of investor categorization (e.g., Graham and Dodd (1934) for value; Banz (1981) for size, Greene and Huang (2008) for nominal share price, and Baker and Wurgler (2004) for dividend policy). For instance, there are mutual funds dedicated to stocks in each of these categories. For some of the other characteristics, such as profitability or sales growth, it is less clear that they form the basis of any particular "style", yet some authors (e.g., Aghion and Stein (2008)) have argued that they may be salient at particular times. Barberis and Shleifer (2003) develop a model in which investors categorize stocks into styles.

Arguably, book-to-market and size are two of the most important attributes that investors use to categorize stocks. Concretely, this means that when issuance is particularly tilted toward large (low B/M) stocks, SMB (HML) is expected to perform well in the subsequent year. In short, firms are successful factor timers.

One objection to the results described so far is that we may be picking up a time-varying loading on the net-issuance anomaly itself—and thus simply repackaging the known relationship between equity issuance and future stock returns. For instance, if one takes the underperformance of net-issuers as a primitive fact, then it might not be surprising to find that HML performs well when glamour firms have recently issued stock, or likewise, when value firms have recently repurchased stock. This concern turns out to be easy to fix: similar to Loughran and Ritter (2000) we can construct long-short characteristic portfolios that exclude the issuing and repurchasing firms. We achieve essentially similar results using these "issuer-purged" portfolios. In essence, this technique allows us to use the net issuance of firms that have similar characteristics to forecast returns, even if the particular firm in question does not issue. In a separate set of tests, we examine industry-related characteristics and find that the issuance and repurchase decisions of firms in a given industry forecast the returns to non-issuers in the same industry.

For more formal tests of characteristics-level mispricing, we adopt a parametric approach motivated by a conditional characteristics model of corporate arbitrage. In the model that we consider, mispricing has both a firm-specific and a characteristic-based component. Yet, firm-level issuance is noisy, and only imperfectly reveals any given firm's mispricing. The main insight derived from this approach is that by using the full cross-section of net stock issuance, we can back-out characteristic-level misprcing. In our baseline panel specification, we regress firm stock returns on the firm's net issuance, the firm's characteristic, and the interaction between the characteristic and an estimate of characteristic-specific mispricing. Relative to the simpler portfolio approach described earlier, the panel approach allows us to add controls beyond the particular characteristic under investigation. Not surprisingly, the panel tests confirm our earlier conclusions.[2]

Taken together, our results suggest that issuance and repurchase activity is partly an attempt to cater to time-varying characteristic mispricing, consistent with our view that firms may play a role as arbitrageurs in the capital market. One natural question is what fraction of the underperformance of recent issuers can be explained by characteristic timing (i.e. the underperformance of other firms with similar characteristics relative to the average return associated with those characteristics). For instance, if firms only respond weakly to time-varying characteristic mispricing, the importance of characteristic timing might be relatively limited from a corporate finance standpoint, although perhaps still useful for forecasting returns. Our estimates suggest that approximately one fifth of the underperformance of recent issuers is due to characteristic timing.

Having established the validity of issuer-repurchaser spreads as proxies for characteristic-specific demand, in the last section of the paper we use these spreads to investigate commonality in characteristic-based mispricing. For instance, using our issuance-based measures of characteristic sentiment, we can ask whether investors typically favor small stocks at the same time that they favor stocks with low book-to-market ratios. We show that two principal components of the characteristic issuer-repurchaser spreads capture nearly 80 percent of the variation among all issuer repurchaser spreads. The first factor loads on characteristics that are

[2] Our characteristic-level forecasting results are useful irrespective of whether the relationship between issuance and stock returns can itself be explained by rational or behavioral models. While initial work argued that managers took advantage of mispricing (e.g, Loughran and Ritter 1995), several recent papers have suggested that the issuance anomaly can be explained within a neoclassical framework. (e.g., Li, Livdan and Zhang (2008) and Carlson, Fisher, and Giammarino (2006)). However, we note that the neoclassical models are hard to reconcile with our results on issuer-purged returns, because these firms do not, by definition, issue stock.

related to what might be called "prudence" or "safety", while the second factor loads on characteristics associated with growth opportunities. Specifically, loadings on the first principal component – the "prudence factor" – suggest that times when sentiment about large firms is high are also times when sentiment about old, high price, low-β, low volatility, and dividend paying firms is high. Similarly, loadings on the "growth factor" indicate that times when investors favor glamour firms are also times when they favor firms with high sales growth and accruals. These findings are useful for putting structure on historical patterns of characteristic mispricing.

The paper proceeds as follows. In the next section, we lay out an empirical model of corporate catering to mispriced characteristics. Section III describes the construction of our characteristic issuer-repurchaser spread measures. In Section IV, we use issuer-repurchaser spreads to forecast returns. In Section V we use panel data to estimate characteristic mispricing and assess the importance of characteristic timing for corporate financing activity. Section VI investigates commonality in the issuer repurchaser spreads and uses this commonality to construct "bottom-up" measures of investor sentiment. The last section concludes.

II. Stock Issuance in a Conditional Characteristics Framework

We first develop an econometric framework for identifying characteristic mispricing. We assume that expected returns are given by the conditional characteristics model:

$$E_{t-1}\left[R_{i,t}\right] = \alpha_{t-1} + \beta_1 \cdot X_{i,t-1} + \beta_2 \cdot (T_{t-1} \times X_{i,t-1}) + \mu_{i,t-1} \qquad (1)$$

where $X_{i,t-1}$ denotes firm i's characteristic and T_{t-1} reflects time-series variation in the conditional expected return associated with that characteristic. For now, it makes no difference if we interpret time-series variation in expected characteristic returns as mispricing (in which case they are deviations from required returns) or if (1) describes investors' required returns.

Equation (1) is a stylized representation of the idea that investor sentiment is associated with different themes during different periods. Themes attach themselves to attributes, such as "internet," "profitable," "large stocks," or "high dividend yield" but we recognize that the mapping between these themes and the characteristics we measure in the data is inherently imperfect.

To keep matters simple, we write (1) as a function of a single characteristic. Without loss of generality, we also assume that $E[T_{t-1}]=0$, so that β_1 represents the average cross-sectional effect of $X_{i,t-1}$ (e.g., the average premium associated with size), and that $X_{i,t-1}$ has the same mean in each cross-section. $\mu_{i,t-1}$ is identically and independently distributed over time and across firms, with mean zero and variance σ_μ^2. This term captures the idea that expected returns can only partially be explained by the characteristic under investigation.

Corporations behave opportunistically on behalf of their existing long-term shareholders, issuing stock when expected returns are low and repurchasing when expected returns are high.[3] Thus, net stock issuance (NS) is given by

$$NS_{i,t-1} = -E_{t-1}\left[R_{i,t}\right] + \varepsilon_{i,t-1} \qquad (2)$$

where $\varepsilon_{i,t-1}$ is independently distributed across time and firms. The noise term $\varepsilon_{i,t-1}$ captures all factors other than market timing that may influence net stock issuance. For example, timing considerations aside, unprofitable firms with growth opportunities may need to issue equity. Another possibility is that some firms would like to exploit mispricing, but can or do not for idiosyncratic reasons. The larger is the variance of $\varepsilon_{i,t-1}$, the smaller is the role of market timing in explaining issuance and repurchase decisions. Note that nothing in equation (2) requires

[3] As long as mispricing eventually reverts, such opportunistic issuance benefits long-term shareholders at the expense of short-term shareholders who buy the mispriced securities. Shleifer and Vishny (2003) and Baker, Ruback and Wurgler (2007) discuss this in more detail.

managers to be knowingly opportunistic or particularly smart. Managers could simply be using rules of thumb that cause them to unknowingly arbitrage mispriced characteristics (e.g., Baker and Stein 2004).[4]

Substituting (1) into (2), we have

$$NS_{i,t-1} = -[\alpha_{t-1} + \beta_1 \cdot X_{i,t-1} + \beta_2 \cdot (T_{t-1} \times X_{i,t-1}) + \mu_{i,t-1}] + \varepsilon_{i,t-1}. \tag{3}$$

Equation (3) says that issuance will respond to market-wide, characteristic-specific, and firm-specific mispricing. We now consider a univariate *cross-sectional* regression of issuance in period *t-1* on characteristics $X_{i,t-1}$: $NS_{i,t-1} = \theta_{t-1} + \delta_{t-1} \cdot X_{i.t-1} + \varepsilon_{i,t-1}$. The slope coefficient from this regression is $\delta_{t-1} = -(\beta_1 + \beta_2 \cdot T_{t-1})$, which is the conditional expected return associated with $X_{i,t-1}$. Assuming that β_1 and β_2 are fixed, the time series of cross-sectional regression coefficients δ_{t-1} will perfectly reveal time variation in characteristic mispricing T_{t-1}. The intuition here is straightforward: while the relationship between expected returns and individual firm issuance and repurchase decisions will be noisy, the full cross-section of net stock issuance contains information about which characteristics are conditionally mispriced.

The benefit of this approach is best illustrated by example: suppose we are interested in forecasting Google's return for the coming year. Following the literature on the cross-section of expected stock returns, we might assemble information on Google's characteristics (e.g. book-to-market, size, dividend yield, profitability, industry, etc.) and construct a forecast under the assumption that each characteristic is associated with some average return in the cross-section. However, the insight that firms may cater to time varying characteristic mispricing suggests a refinement. We can use the net issuance of firms that have the same characteristics as Google to

[4] For simplicity, equation (2) does not consider feedback effects of issuance on future returns. In Greenwood, Hanson, and Stein (2008), for example, firms issue more when expected returns are low, but in equilibrium, firms "fill the gap," reducing predictability. Another assumption implicit in (2) is that firms respond with the same intensity to mispricing in any given period.

back-out whether Google's characteristics are conditionally mispriced. Such information is captured by δ_{t-1} and can be used improve to our forecast of Google's returns.

A simple implementation of this idea is to compute differences between the characteristics of issuers (firms with high $NS_{i,t-1}$) and repurchasers (firms with low $NS_{i,t-1}$); the time-series of these differences should negatively forecast returns associated with that characteristic. We adopt this implementation in Section III.

A more formal implementation can be seen in a panel regression of stock returns on lagged values of the characteristic, lagged net issuance, and interactions of the lagged characteristic with our cross-section-based estimate of characteristic mispricing (T_{t-1}):

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + b_2 \cdot (T_{t-1} \times X_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t} \tag{4}$$

Does knowledge of T_{t-1} help forecast stock returns beyond a firm's own issuance? We have

$$b_2 = \beta_2 \frac{\sigma_\varepsilon^2}{\sigma_\mu^2 + \sigma_\varepsilon^2}. \tag{5}$$

Thus, β_2 will be non-zero as long as $\sigma_\varepsilon^2 > 0$: our estimates of time-varying characteristic mispricing will have incremental forecasting power so long as individual firm net issuance is a noisy signal of expected returns.

Another useful exercise is to ask how the coefficient on $NS_{i,t-1}$ will be affected once we control for characteristic-specific mispricing. First, we note that the coefficient c on net issuance in equation (4) is given by:

$$c = -\frac{\sigma_\mu^2}{\sigma_\mu^2 + \sigma_\varepsilon^2}. \tag{6}$$

This can be compared to the net issuance coefficient in the following specifications in which our proxy for time-varying characteristic mispricing has been omitted:

$$R_{i,t} = a_t + c \cdot NS_{i,t-1} + u_{i,t} : \qquad c = -\frac{(\beta_1^2 + \beta_2^2 \cdot Var[T_{t-1}]) \cdot Var[X_{i,t-1}] + \sigma_\mu^2}{(\beta_1^2 + \beta_2^2 \cdot Var[T_{t-1}]) \cdot Var[X_{i,t-1}] + \sigma_\mu^2 + \sigma_\varepsilon^2}; \tag{7}$$

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + c \cdot NS_{i,t-1} + v_{i,t} : \qquad c = -\frac{(\beta_2^2 \cdot Var[T_{t-1}]) \cdot Var[X_{i,t-1}] + \sigma_\mu^2}{(\beta_2^2 \cdot Var[T_{t-1}]) \cdot Var[X_{i,t-1}] + \sigma_\mu^2 + \sigma_\varepsilon^2}. \tag{8}$$

In all three specifications, the coefficient on net issuance c is increasing in σ_μ^2 and decreasing in σ_ε^2. Intuitively, net issuance is a stronger predictor when there is meaningful variation in expected returns that is not linked to characteristic X (i.e. σ_μ^2 is large) and when issuance is a more reliable signal of future returns (i.e. σ_ε^2 is small).

In the univariate specification (equation (7)), the coefficient on net issuance reflects both the unconditional and conditional returns associated with the characteristic. Once we add $X_{i,t-1}$ to the regression (equation (8)), the unconditional term drops out. However, the coefficient on *NS* still reflects the fact that issuance responds to time-varying characteristic mispricing. Only when we include both $X_{i,t-1}$ and its interaction with T_{t-1} in the panel regression (equation (4)), do we isolate the predictive information that is unique to *NS*. Thus, the difference in the regression coefficient c between equations (4) and (8) reflects the fact that net stock issuance is partially driven by corporate catering to time-varying characteristic mispricing.

III. Issuer-repurchaser characteristic spreads

The previous section suggests that if we measure the extent to which net issuers are disproportionately firms endowed with a characteristic, that this should provide information about the conditional mispricing of that characteristic. We do this for eleven characteristics, as well as a set of industry-related attributes.

A. Calculation

Following Fama and French (2008a), we define net stock issuance (*NS*) as the change in log split-adjusted shares outstanding from Compustat (CSHO x AJEX).

In December of year *t-1*, we divide all firms into *New lists*, *Issuers*, *Repurchasers*, and *Others* (i.e., non-issuers) based on share issuance in year *t-1*. *New lists* are firms that listed during year *t-1* (these firms have *Age* less than one in December of year *t-1*). Since many of the characteristics we study cannot be defined for new lists, we discard these firms in our baseline measures. The remaining seasoned firms are divided into three categories: *Issuers* have *NS* greater than 10%. *Repurchasers* have *NS* less than -0.5%, and *Others* have *NS* between -0.5% and 10%. Table 2 shows this breakdown by year. Between 1962 and 2006, an average 6.6% of firms were new lists, 12.4% were issuers, and 13.5% were repurchasers.[5]

Table 2 also shows the average net issuance for firms in each group. Among issuers, average net issuance hovered near 20% during the 1960s and 1970s, trended upwards during the 1980s, reaching a peak of 43.9% in 1993, and has declined somewhat since the early 1990s. Repurchasers have bought back between 3% and 7% of shares, on average, since the early 1970s; however, there has been a modest trend toward smaller repurchases in recent years. Due to growth in executive compensation, the average value of *NS* among non-issuers has risen slightly from 1.1% in 1973 to 2.0% in 2006 (Fama and French 2005).

Our objective is to measure time-series variation in the composition of issuers and repurchasers. Let $X_{i,t-1}$ denote firm *i*'s value of characteristic (or characteristic decile) *X* in year

[5] Since we are using a composite net issuance measure, issuers include firms completing SEOs, stock-financed mergers, and other corporate events that significantly increase shares outstanding (e.g. large executive compensation schemes). Using SDC data on SEOs from 1990-2007, we estimate that 75% of SEOs increase split adjusted shares outstanding by at least 10%, so we are capturing all but the smallest SEOs. Regardless, our results are robust to using other cut-offs.

t-1. We define the issuer-repurchaser spread for characteristic *X* as the average characteristic decile of issuers minus the average characteristic decile of repurchasers:

$$ISSREP_{t-1}^{X} = \frac{\sum_{i \in Issuers} X_{i,t-1}}{N_{t-1}^{Issuers}} - \frac{\sum_{i \in Repurchasers} X_{i,t-1}}{N_{t-1}^{Repurchasers}}. \quad (9)$$

Deciles are based on NYSE breakpoints. We define characteristic issuer-repurchaser spreads for book-to-market equity (*B/M*), sales growth ($\Delta S_t/S_{t-1}$), accruals (*Acc/A*), size (*ME*), nominal share price (*P*), age, beta (β), idiosyncratic volatility (σ), distress (*SHUM*) proxied using the Shumway (2001) bankruptcy hazard rate, dividend policy (*Div*), and profitability (*E/B)*.[6] For now, we note that these characteristics capture themes related to growth and growth opportunities (*B/M*, $\Delta S_t/S_{t-1}$, *Acc/A*), prudence or safety (*ME*, *P*, Age, β, σ, *SHUM*, *Div*), and profitability (*E/B*).[7] The detailed construction of each characteristic is described in the Appendix. All characteristics except for dividend policy are measured using NYSE deciles; dividend policy is a dummy variable that takes a value of one if the firm paid a cash dividend in that year. We follow the Fama and French (1992) convention that accounting variables are measured in the fiscal year ending in year *t-1* and market-based variables are measured at the end of June of year *t*.

Intuitively, the issuer-repurchaser spread captures the tilt of net issuance with respect to a given characteristic. A few alternate constructions could capture the same intuition. One obvious alternative would be to compare characteristics between new lists and existing firms. Underlying this would be the idea that a firm's decision to go public is affected by whether its characteristics are currently in favor. Not surprisingly, spreads based on the characteristics of new lists are

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6 Industry-related characteristics require a slightly different methodology; we return to these at the end of this section.

7 Profitability could be grouped with either "prudence" or "growth"-like characteristics, thus we treat it as a separate category. In the data, the issuer-repurchaser spread for profitability is correlated with spreads in both categories.

correlated with measures we compute in (9), suggesting that corporate arbitrage is not limited to existing firms but also reflected in the going public decision (not tabulated). However, many of the characteristics we consider do not have requisite data to compute issuer-repurchase spreads for new lists.[8]

Although we examine a variety of characteristics, a priori one might expect our approach to work better for some characteristics than for others. In order for $ISSREP^X$ to forecast returns associated with characteristic X at least two conditions must be met. First, the characteristic must be subject to time-varying mispricing. Second, corporate managers must actually respond to this time-varying mispricing. While a large number of characteristics could in principle meet the first criterion, we would only expect a subset to meet the second condition: in practice there is likely to be a delay between the recognition of mispricing and managers' ability to issue more equity (in an SEO, for example, there is the delay in registering the new shares and completing a road show). Thus the characteristic must be sufficiently stable for market timing to be feasible and worthwhile. As a result, we would be surprised if firms were timing their issuance and repurchase decisions to exploit short-lived signals such as one-month reversal. By contrast, we would be less surprised to find firms responding to the mispricing of more persistent characteristics such as B/M, size, or industry.

When using the issuer-repurchaser spreads to forecast returns, we primarily focus on the 1972-2006 period, thus forecasting returns for 1973-2007, although we always show results for the full 1963-2007 period as well. Our focus on the later data is for three reasons. First, we worry that characteristic spreads are contaminated by changes in the CRSP universe due to the introduction of NASDAQ data in December 1972. Second, Pontiff and Woodgate (2008) and

[8] We achieve many of the same results if we instead define a "new list minus repurchaser" spread constructed analogously to our main predictor. However, for several of the characteristics we consider, the new list characteristic series are noisier than our SEO-based series, driven by a few years in which the number of new lists is quite small.

Fama and French (2008b) find that net share issuance does not predict returns prior to 1970 and 1963, respectively. Bagwell and Shoven (1989) point out that repurchases surged after 1982. Fama and French (2005) argue that share issuance has become far more widespread post-1972, while Fama-French (2008c) show that net issuance was more responsive to valuations (B/M) in their 1983-2006 sub-sample than from 1963-1982. Third, the growth of professional money management in the 1980s and 1990s, especially the growth of mutual funds, coincided with an increase in style-based investing (e.g. the Morningstar style-box). This may have increased the extent of characteristic-based mispricing.

B. Discussion

Table 3 lists, and Figure 3 plots, issuer-repurchaser spreads for each of the eleven characteristics. Panel A of Table 4 lists the average cross-sectional correlations between our eleven characteristics (in decile form) and Panel B of Table 4 summarizes the time-series correlations between the eleven issuer-repurchaser spreads. To keep our discussion brief, we group attributes together according to whether they are growth-, prudence-, or profitability-related. Where possible, we tie the time-series behavior of the issuer-repurchaser spreads to historical accounts of characteristic-based mispricing.

Measures of Growth: Book-to-market, Sales growth, and Accruals

Panel A of Figure 4 shows that the issuer-repurchaser spread for book-to-market is always negative, as issuers are disproportionately glamour firms throughout the sample. Nevertheless, there is significant time-series variation. The spread starts out low during the "tronics" fad of 1962 and is low again during the boom of 1967-1968. The spread is high during the bear market of the early to mid-1970s, but declines during the late 1970s and the IPO boom of the early 1980s. The spread begins to rise in 1983 and remains high through the remainder of the 1980s. The spread drops sharply during the technology bubble in 1999, before rising significantly afterwards.

The issuer-repurchaser spread for sales growth is always positive, indicating that issuers have higher sales growth than repurchasers. Panel B of Figure 4 suggests that demand for firms with high sales growth firms was particularly strong during the late 1960s and early 1970s, the early 1980s, and again in the late 1990s. The issuer-repurchaser spread for accruals is typically positive and is highly correlated with the issuer-repurchaser spread for sales growth ($\rho = 0.72$).

Measures of Prudence or Safety: Size, Price, Age, β, σ, Distress, and Dividend policy

As shown in Panel B of Table 4, the issuer-repurchaser spreads for size, price, age, beta, idiosyncratic volatility, and dividend policy are all strongly correlated, with pairwise correlations ranging from 0.44 to 0.97 in magnitude.

The issuer-repurchaser spread for size is close to zero on average. That is, there has been little *unconditional* size tilt in stock issuance. However, there is significant time-series variation. As shown in Panel D of Figure 4, large firms went out of favor in the late 1960s, returning to favor during the "nifty-fifty" period of the early 1970s. The spread appears slightly countercyclical, increasing modestly during each of the recessions in our sample with the exception of the 1980-1982 recession.

Greene and Hwang (2008) suggest that investors classify stocks based on their nominal share price. Panel E shows that the issuer-repurchaser spread for share price closely tracks the spread for size. Benartzi, Michaely, Thaler and Weld (2007) point out that size and price are strongly correlated in the cross-section, and Baker, Greenwood, and Wurgler (2008) find that the valuations of high price firms tend to be similar to the valuations of large firms. Thus the correlation between the spreads for size and the spread for price is not surprising.

As shown in Panel F of Figure 4, the issuer-repurchaser spread for age also tracks the spread for size, particularly during the first half of the sample. Consistent with Loughran and Ritter (2004), who find little change in the age of IPO firms from 1980-1998, the age spread has been relatively constant since the early 1980s. However, there is a small shift toward older issuers after the collapse of technology stocks in 2000.

The issuer-repurchaser spreads for beta and volatility are generally similar (ρ = 0.68). While the issuer repurchaser spread for beta is usually positive, Panel G shows that issuance was tilted towards high beta firms during the late 1960s, early 1980s, and late 1990s. The issuer-repurchaser spread for volatility is always positive and has trended steadily upwards since the late 1970s. Comparing the correlations in Panels A and B of Table 4, we find that the issuer-repurchaser spread for beta is significantly correlated with the other prudence-themed spreads, in spite of a low average cross-sectional correlation between beta and the raw characteristics.

The issuer-repurchaser spread for distress in part reflects the previous results for size and volatility. Our distress measure is the bankruptcy hazard rate estimated by Shumway (2001) and reflects a linear combination of size, volatility, past returns, profitability, and leverage. As shown in Panel I of Figure 4, issuers typically face higher bankruptcy risks than repurchasers. Demand for firms with high bankruptcy risk was elevated during the late 1960s and early 1970s and was low during the mid-1970s. Not surprisingly, there is some tendency for the issuer-repurchaser spread for distress to decline during recessions.

Last, the issuer-repurchaser spread for dividend policy is highly correlated with the spreads for size and age. This series is also 50% correlated with the Baker and Wurgler (2004) dividend premium (untabulated). This is not surprising given the cross-sectional correlation between net issuance and market-to-book ratios.

Measures of Profitability

Consistent with the findings in Fama and French (2004), Panel K of Figure 4 shows that there is a steady downward trend in the profitability of issuers relative to repurchasers.

IV. Corporate arbitrage and characteristic portfolio returns

In this section, we use issuer-repurchaser spreads to forecast characteristic returns. We also consider an adjustment to our baseline methodology that allows us to consider industry-related characteristics.

A. Long-short portfolio forecasting regressions

Our main prediction is that the long-short portfolio for a given characteristic will underperform following periods when the issuer-repurchaser spread is high. Table 5 shows the results from our baseline forecasting regression:

$$R_t^X = a + b \cdot ISSREP_{t-1}^X + u_t \tag{10}$$

where R^X denotes the return on the size-balanced portfolio that buys (sells short) firms with high (low) values of characteristic *X*. The construction of these portfolios follows Fama and French (1993).[9] We follow the usual timing convention that issuer-repurchase spreads for fiscal-years

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[9] Firms are independently sorted into Low, Neutral, or High groups of characteristic *X* using 30% and 70% NYSE breakpoints, and as small or big relative to the NYSE size median. We compute value weighted returns within these 6 size-by-*X* buckets. The long-short return for characteristic *X* is defined as R^X = ½ (R_{BH} - R_{BL}) + ½ (R_{SH} – R_{SL}) where, for instance, R_{BH} is the value-weighted return on big, high-*X* stocks.

ending in calendar year *t-1* are matched to monthly returns between July of year *t* and June of year *t+1*.[10]

Panel A of Table 5 shows the results of this univariate forecasting regression for the 1963-2007 and 1973-2007 sample periods. As can be seen in Panel A, our central prediction is confirmed for many, but not all, of the characteristics we consider. For example, using returns between 1963 and 2007, Table 4 shows that when issuers have high B/M relative to repurchasers, subsequent returns to HML are poor. Likewise, when issuers are particularly small relative to repurchasers, subsequent returns on SMB are low.[11] Considering both the 1963-2007 and 1973-2007 periods, our issuer-repurchaser spreads forecast the returns of all characteristic portfolios in the expected direction, with a single exception. In the later 1973-2007 sample, we obtain statistically significant results for book-to-market (*B/M*), size (*ME*), price (*P*), distress (*SHUM*), payout policy (*Div*), and profitability (*E/B*). In untabulated tests, we find that the eleven issuer-repurchaser spreads are jointly significant forecasters of characteristic returns at greater than the one percent level.[12] However, consistent with the previous discussion, we typically find the strongest predictability for characteristics that are persistent at the firm level, such as B/M, size, price, and dividend policy.

The predictability documented in Table 5 is economically significant. For example, the coefficient -0.713 in the first row and column of Table 5 implies that when the issuer-repurchaser spread for B/M rises by one decile, HML returns fall by 71 bps per month in the following year.

[10] In these monthly regressions, the $ISSREP^X$ predictor is measured annually, so standard errors are clustered by portfolio formation year. As a result, we draw the same inferences if we estimate annual forecasting regressions.

[11] The portfolio for size (*ME*) is long Big stocks and short Small stocks, but is otherwise analogous to SMB (i.e. it is B/M-balanced). In other words, the size portfolio is “BMS” – i.e., negative one times SMB.

[12] Specifically, we estimate a system of eleven forecasting regressions by OLS and perform an F-test that the coefficients on all the issuer-repurchaser spreads are jointly zero. This test takes into account the correlation of residuals across the forecasting regressions.

Thus, a one standard deviation increase in $ISSREP^{B/M}$ of 0.58 is associated with a 41 bps decline in monthly HML returns. One may wish to compare these effects to the mean and standard deviation of characteristic portfolio returns shown in Panel C of Table 1. As can be seen, 41 bps is large relative to the average monthly HML return of 44 bps and its monthly standard deviation of 295 bps. Similar calculations show that the estimates in Table 5 imply economically meaningful predictability for size (*ME*), price (*P*), β, distress (*SHUM*), dividend policy (*Div*), and profitability (*E/B*).

In Panel B, we add controls for contemporaneous (monthly) realizations of market excess returns, HML, SMB, and UMD, thus we effectively use $ISSREP^{X}$ to forecast the 4-factor α of the long-short characteristic portfolios.[13] While these results are generally similar to those from the univariate specifications in Panel A, there are some minor differences. For instance, in the 1973-2007 sample period the result for profitability (*E/B*) is no longer significant once we add the 4-factor controls; however, the result for β is now borderline significant (t = -1.80). Despite the fact that many of our characteristic-based spreads survive the additional controls, conceptually we prefer the univariate specifications. Specifically, for many of our characteristics, mispricing might be correlated with temporary mispricing of size or book-to-market, and thus the HML and SMB controls are potentially removing economically interesting variation.

One may wonder whether our forecasting results are driven by the issuer side of the issuer-repurchaser spread, or by the repurchaser side. We can decompose the spread into these two pieces (issuers minus others and others minus repurchasers). In untabulated results, we find that both issuance and repurchase activity contribute to the predictability shown in Table 5.

[13] We do not include HML as a control in the regressions for B/M or SMB as a control in the ME regressions.

B. Issuance purged forecasting regressions

One critique of the results presented so far is that they might simply restate the net issuance anomaly in characteristic space. This would work as follows. Suppose we take the negative relationship between net stock issues (*NS*) and future returns as a primitive fact. Consider a year where the issuer-repurchaser spread for characteristic *X* is high. The long-side of the high-*X* minus low-*X* portfolio in that year is likely to contain a higher than usual number of issuers and, to the extent that *NS* and *X* each contain independent information about future returns, we would expect below average returns to the portfolio in that year. Thus, instead of time-varying characteristic mispricing, our results could reflect a time-varying loading on the net-issuance anomaly.

Following the approach in Loughran and Ritter (2000), we can address this critique by forecasting the returns to "issuer-purged" characteristic portfolios computed using only the set of non-issuing firms. Specifically, while *ISSREP* is calculated as before, the characteristic returns are now based on the subset of seasoned firms where *NS* is between -0.5% and 10%. The cross-sectional breakpoints used when computing the issuer-purged factors are the same as those used for the standard or un-purged factors.

Table 6 shows these results. As expected, the results are weaker for several characteristics, suggesting that our initial findings in Table 5 are partially picking up the direct effect of issuance. However, in the 1973-2007 period, the correlation between the issuer-repurchaser spread and subsequent returns remains negative in nine out of eleven cases, and significant or marginally significant in five cases: book-to-market, size, price, distress, and payout policy. In summary, the issuance and repurchase decisions of firms contain information about characteristic mispricing which can be used to forecast returns for non-issuers.

The results for issuer-purged returns help rule out mechanical explanations for the net issuance anomaly. For example, Eckbo, Masulis, and Norli (2000) argue that issuance reduces returns through a mechanical leverage effect on equity betas. Our forecasting results for the issuer-purged series are immune to this critique because there are no leverage consequences for stocks that don't issue.

C. Industry characteristics

So far we have not considered industry-based mispricing. Yet, investors frequently categorize stocks by industry, and waves of issuance and repurchases often cluster by industry. The sole reason for the omission thus far is that industry membership is inherently categorical rather than continuous, and thus does not map neatly into our baseline methodology. For example, our previous methodology attempts to identify whether investor favor high book-to-market stocks more than low book-to-market stocks, but with industry, we seek to identify whether investors favor "telecoms" over "manufacturing."

We can adapt our approach to study the mispricing of industry characteristics. We estimate pooled monthly forecasting regressions of the form

$$R_{j,t} = a_t + b \cdot NS_{j,t-1} + c \cdot BM_{j,t-1} + d \cdot ME_{j,t-1} + e \cdot MOM_{j,t-1} + f \cdot \beta_{j,t-1} + u_{j,t} \,. \tag{11}$$

In equation (11), $R_{j,t}$ is the value-weighted return to stocks in industry *j*. As in the previous section, industry returns are purged: we use only the subset of seasoned firms that did not issue or repurchase stock in the prior fiscal year. The lagged independent variables include the value-weighted averages of *NS* and *BM* for stocks in that industry, the log market capitalization of stocks in that industry (*ME*), the industry's cumulative returns between months *t-13* and *t-2* (*MOM*), and the industry's market beta (β). Our baseline specifications are estimated with month fixed effects (a_t), so the identification is from cross-industry differences in net issuance.[14] We also present specifications that include industry fixed-effects. Standard errors are clustered by month to account for the cross-sectional correlation of industry residuals.

To estimate (11), we require an appropriate definition of industry. While the usual objective is to identify groups of firms with correlated fundamentals, our goal is to best capture the groupings that investors use to classify stocks ex ante. Theory offers us no guide and so we follow the common practice in academic studies of using the 48 industries identified by Fama and French (1997).[15] Fortunately, many of these industry definitions correspond to those investors use to classify stocks. For example, there are mutual funds with mandates based on communications, utilities, petroleum and natural gas, all of which occupy distinct industries under the Fama and French classification scheme.

The results of estimating equation (11) are shown in Table 7. The table shows that the issuance and repurchase decisions of firms in a given industry forecast the returns to non-issuers in the same industry. The estimate of -0.019 in the first column implies that if industry *NS* increases by one percentage point, the returns to non-issuers in the same industry decline by 1.9 bps per month during the following year. Alternately, a one standard deviation increase in industry *NS* of 5.44% lowers industry returns by 11 bps per month or 1.33% per year. In Panel B we estimate equation (11) replacing the right-hand-side variables with their industry ranks (i.e. 1

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[14] We obtain similar results using the Fama-MacBeth (1973) procedure, albeit with slightly diminished significance. The pooled estimator with time fixed-effects is a weighted average of the coefficients from monthly cross-sectional regressions. However, the panel estimator efficiently weights these cross-sections (e.g. periods with greater cross-industry variance in *NS* receive more weight), whereas Fama-MacBeth assigns equal weights to all periods.

[15] Chan, Lakonishok and Swaminathan (2007) compare the Fama and French (1997) classifications to GICS-based classifications commonly used by practitioners. Although they find that GICS-based classifications are slightly better, the Fama and French (1997) classifications perform reasonably. Our sense is that the Fama French classifications may be too fine to capture the broad patterns of industry-level sentiment that we have in mind. Notwithstanding, we do find evidence of predictability.

through 48). This yields even stronger evidence that industry net issuance is negatively related to future returns.

D. Robustness issues

Below we describe the results of a number of robustness tests. To save space, we describe the results here and tabulate the results in the Internet Appendix.[16]

The first set of concerns relates to measurement of issuer-repurchaser spreads. We obtain broadly similar results if (1) net issuance is derived from CRSP data as in Pontiff and Woodgate (2008); (2) issuer-repurchaser spreads are redefined as the difference in raw characteristics between issuers and repurchasers (in contrast with characteristic deciles); (3) we use different cut-offs for partitioning issuers, repurchasers, and non-issuers; (4) we use a "characteristic net issuance spread" defined as the difference in average *NS* (or *NS* decile) between firms with high and low values of *X*; and (5) we use the coefficient from a cross-sectional regression of *NS* (or *NS* decile) on characteristic *X* (or *X* decile).

A second set of concerns relates to measurement of returns themselves: We obtain similar results if we instead use the returns to portfolios that are long (short) stocks in decile ten (one) of characteristic *X* (in contrast to the size-balanced long-short portfolios that we use as a baseline). We also obtain similar results with equal weighted portfolios.

A third set of concerns relates to potential controls in our forecasting regressions. Our portfolio-level tests already include contemporaneous HML, SMB, UMD, and the market excess return. We have also tried controlling for past long-short characteristic returns, as well as a time trend. Adding a time trend strengthens the results for several characteristics by eliminating a

[16] See http://www.people.hbs.edu/rgreenwood/ papers/CTSupplementaryResults.pdf for untabulated results described in this section.

secular trend in our measure (e.g., in β and σ). However, the result for profitability, which trends strongly over time, is weakened by the inclusion of this trend. Since we previously noted a small cyclical component to some of the *ISSREP* series, we estimate specifications in which we include a simple recession dummy as a control. The results are qualitatively unchanged by this addition.

A fourth set of concerns relates to the composition of firms that respond to characteristic mispricing. For instance, Fama and French (2008c) suggest that opportunistic financing has increased markedly for small firms since 1982. Reassuringly, we obtain similar results if the issuer-repurchaser spreads are defined using only NYSE firms. A related question is whether the characteristic return predictability that we document is present mainly among small or large firms. We find that, while the effects are typically strongest for small firms, *ISSREP* has some forecasting power for long-short characteristic portfolios for both large and small stocks.

A last set of concerns is related to the "pseudo market timing" bias (Shultz (2003)). If issuers behave in a contrarian fashion so that issuer-repurchaser spreads increase when characteristic returns are high, one may worry that our results are driven by "aggregate pseudo market-timing" bias of the sort described in Butler, Grullon, and Weston (2005). As pointed out by Baker, Taliaferro, and Wurgler (2006), this is simply a form of small-sample bias studied in Stambaugh (1999). The bias is most severe when the predictor variable is highly persistent and innovations to the predictor are correlated with return innovations. We compute bias-adjusted estimates of b and appropriate standard errors following Amihud and Hurvich (2004). It turns out that the bias is quite small for all characteristics since our issuer-repurchaser spreads are not too persistent and, more importantly, are not strongly related to past characteristic returns.

V. Panel Estimation of Characteristic Mispricing

A. Panel regressions

In this section, we interact characteristics with cross-sectional measures of characteristic mispricing to forecast firm-level stock returns. Conceptually, the panel technique should yield similar results to those shown in Tables 5 and 6, with the benefit that we can now control for a host of return predictors at the firm level. For example, we can control for the possibility that our forecasting results are simply picking up a book-to-market effect aggregated to the characteristic level. However, our primary motivation for exploiting the full panel is that we can test the conjectures put forth in Section II.[17] In particular, following our earlier discussion, we can ask how much of the cross-sectional forecasting ability of net issuance is due to characteristic timing.

Even ignoring the additional control variables, we might expect there to be some small differences with the results in Tables 5 and 6. For one, the panel estimation allows us to control parametrically for the direct effects of net issuance – rather than simply throwing out issuers and repurchasers altogether. In addition, because the panel weights all firms equally, it puts more weight on small firms where one might expect to find stronger evidence of characteristic predictability.

We start by measuring time-series variation in the net issuance tilt with respect to each characteristic. For each characteristic *X* in each year *t-1*, we estimate a cross-sectional regression of net issuance on the characteristic decile:

$$NS_{i,t-1} = \theta_{t-1} + \delta_{t-1}^{X} \cdot X_{i,t-1} + \varepsilon_{i,t-1} \tag{12}$$

[17] Even ignoring the additional control variables, we might expect there to be some small differences with the results in Tables 5 and 6. For one, the panel estimation allows us to control parametrically for the direct effects of net issuance – rather than simply throwing out firms that issue or repurchase stock. In addition, because the panel weights all firms equally, it puts more weight on small firms where one might expect to find stronger evidence of characteristic predictability.

This procedure yields a series of 45 estimates (between 1962 and 2006) of δ^X. Conceptually, these are parametric versions of the issuer-repurchaser spreads, with the primary difference being that δ^X may fluctuate more than the simple spread if the cross-sectional dispersion of issuance varies over time. Not surprisingly, these characteristic issuance tilts are highly correlated with the issuer-repurchaser spreads computed earlier. For example, the correlation between the issuer-repurchaser spread for size and the corresponding δ^{ME} time series is 0.79.[18]

Using this time-series of δ^X, we now estimate annual panel regressions of the form:

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + b_2 \cdot (\delta^X_{t-1} \times X_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t}. \quad (13)$$

The right-hand side includes lagged values of net issuance, lagged values of the characteristic, interactions of the characteristic with the issuance tilt δ^X. We include year fixed effects (a_t) so as to focus on cross-sectional patterns in stock returns i.e., equation (13) is a conditional cross-sectional model of stock returns. We include *NS* in all specifications in order to control for the direct relationship between net issuance and stock returns. To the extent that we obtain a negative coefficient on the interaction term, b_2, it suggests that firms are responding to time-varying characteristic mispricing and that their behavior contains information about future characteristic returns. Standard errors are clustered by year in (13) to account for the cross-sectional correlation of residuals.

Table 8 shows these results. In large part, they confirm our earlier conclusions. Characteristic issuance tilts predict stock returns for the following attributes: book-to-market, accruals, size, price, age and distress. Beta, volatility, and dividend policy all attract t-statistics

[18] However, δ^X is somewhat less correlated with the issuer-repurchaser spreads for growth-related characteristics. For example, the correlation between $\delta^{B/M}$ and the corresponding issuer repurchase spread is 0.18. The lower correlation here reflects the increased cross-sectional dispersion of net issuance in the 1990s and 2000s.

greater than 1.40.[19] In Panel B, we re-estimate the panel regression (13) for each characteristic, additionally controlling for firm-specific size, book-to-market, momentum, and beta. As shown in the table, these results are quite similar to those shown in Panel A.

B. The economic significance of characteristic timing for corporate issuance

The previous results suggest that issuance and repurchase activity is partly an attempt to cater to time-varying characteristic mispricing. But what fraction of the underperformance of net issuers does such characteristic timing explain? We can address this question within our panel framework.

Our model of corporate arbitrage predicts that the coefficient on net share issuance from a multivariate panel regression of returns on *NS* and *X* (i.e. $R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + c \cdot NS_{i,t-1} + u_{i,t}$) will decline in magnitude once we interact *X* with our proxy for characteristic mispricing. Intuitively, the coefficient on *NS* in the un-interacted specification reflects the fact that net issuance is partially an attempt to exploit time-varying mispricing of *X*. Since this effect is eliminated once we interact *X* with δ^X, the difference between the *NS* coefficients in these two specifications is one way of assessing the importance of corporate characteristic timing.[20] However, this is a conservative estimate of the magnitude of corporate characteristic timing, since the coefficient on *NS* will reflect the timing of any omitted characteristics as well.

As expected, adding the interaction of our mispricing proxy with the characteristic reduces the coefficient on *NS* in Table 8. For instance, in the regressions for the book-to-market

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[19] We note that differences between the 1963-2007 and 1973-2007 periods in Table 7 are minimal; this is because the panel approach weights all firms-years equally, thus giving a higher effective weight to later sample years. However, we obtain similar results if we instead weight all years equally.

[20] In our model, the decline in the magnitude of the *NS* coefficient depends on $\beta_2^2 \cdot Var[T_{t-1}]$ - the variance of the conditional expected return associated with *X*.

characteristic, the coefficient on *NS* falls from c = -0.084 (t = -3.10) in the un-interacted specification to c = -0.075 (t = -3.12) once we include the interaction term. This suggests that net issuance is partly an attempt to time returns associated with book-to-market. The estimate of c falls by a similar amount for age, volatility, and dividend policy. Other characteristics have less of an effect on estimated c, although in all eleven cases the effect is in the right direction. We note however that what matters is the *collective* ability of publicly observable characteristics to explain an interesting fraction of the forecasting ability of *NS*. To test this, we estimate the forecasting regression including a larger set of characteristics and these characteristics interacted with estimates of characteristic mispricing:

$$R_{i,t} = a_t + \sum_k b_{1k} \cdot X^{(k)}_{i,t-1} + \sum_k b_{2k} \cdot (\delta^{(k)}_{t-1} \times X^{(k)}_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t} \tag{14}$$

where k indexes characteristics. To cut down on collinearity of the $\delta^{(k)}$ predictors in (14), we restrict our attention to characteristics for which $\delta^{(k)}$ reliably forecasts returns in Tables 5, 6, and 8: book-to-market, size, distress, and dividend policy. Including these predictors reduces c from -0.104 to -0.088. This suggests that about 15% of the forecasting ability of *NS* is due to corporate timing of mispriced characteristics. Again, this number is likely to be conservative given that we have limited ourselves to a handful of relevant characteristics.

A second way to assess the role of characteristic timing in explaining the underperformance of recent issuers is to modify the approach in Daniel, Grinblatt, Titman, and Wermers (1997). Specifically, we decompose the return to a long-short strategy based on net stock issuance into three components: the return in excess of the return on firms with similar characteristics ("*characteristic selectivity*"), the return associated with the long-run average characteristics of the net issuance portfolio ("*average style*"), and the return associated with the timing of those characteristics ("*characteristic timing*").

Each year we form a portfolio that is long (short) firms in the lowest (highest) NYSE decile of net stock issuance. Motivated by our earlier findings, we limit our matching characteristics to size and book-to-market, although we could carry out a similar exercise for any of the eleven attributes considered so far. We match each firm in this portfolio to one of 25 size and book-to-market benchmark portfolios. To construct these benchmarks, firms are first grouped by NYSE size quintile, and within each size quintile, we then sort firms into *B/M* quintiles. The benchmark portfolios include only seasoned firms that did not issue or repurchase stock in the prior year.

Following Daniel, Grinblatt, Titman, and Wermers, *characteristic selectivity* is the difference between the portfolio return and the weighted return on the matched benchmark portfolios. Next, let $w_{b,t-1}$ denote the total portfolio weight of firms matched to benchmark b at time *t-1*. The *average style* and *characteristic timing* components of the net issuance portfolio return are

$$AS_t = \sum_b \overline{w_b} R_t^b \text{ , and} \tag{15}$$

$$CT_t = \sum_b (w_{b,t-1} - \overline{w_b}) R_t^b \text{ .} \tag{16}$$

where $\overline{w_b}$ denotes the time-series mean of w_b. The average style term reflects the performance on a benchmark portfolio that captures the *average* size and *B/M* composition of the *NS* portfolio. The characteristic timing component reflects deviations of the current size and *B/M* composition of the portfolio from its long-run average.

We report the results of this decomposition in Table 9. Each row decomposes the return on the net stock issuance portfolio into *CS*, *AS*, and *CT* components. We show results for both value and equal-weighted portfolios. The first column shows the average return to the long-short *NS* strategy. For the value-weighted *NS* strategy, the 9.23% annual return can be decomposed into a 7.39% characteristic selectivity return, an -0.08% average style return, and a 1.92% characteristic timing return. Thus, approximately 21 percent of the forecasting ability of *NS* in the cross-section comes from firms' ability to time size and book-to-market characteristics. The results for the equal- and value-weighted portfolios are similar.

Combined with our previous results, this decomposition has several implications for the large literature that studies the stock market performance of SEOs, IPOs, and stock-based acquirers. In many of these studies, researchers purge the returns of event firms of size and book-to-market effects (e.g. they use variants of the characteristic selectivity measure). Our results suggest that this methodology may be too conservative in light of the forecastability of characteristic mispricing: low market-to-book firms issue stock just prior to periods when low market-to-book firms in general are going to perform poorly, and similarly for small firms. More broadly, event studies that compare the performance of sample firms to firms matched on characteristics will omit any returns coming from event firms' ability to time those characteristics.

VI. Bottom-up Measures of Investor Sentiment

Having shown that issuer-repurchaser spreads are reasonable proxies for characteristic-specific mispricing, we now use our issuance-based measures to explore time-series commonalities in characteristic mispricing. As we will see, this analysis yields "bottom-up" measures of investor sentiment which treat the mispricing of different characteristics as primitives.

Before beginning the formal analysis, we revisit the correlations listed in Table 4. Panel A lists the average cross-sectional correlations between our eleven characteristics and Panel B shows the time-series correlations between the corresponding issuer-repurchaser spreads. There is an important link between the two panels, since part of the time-series correlation of any pair of spreads is driven by the cross-sectional correlation between the characteristics themselves. Consider for example the cross-sectional correlation between sales growth and accruals, shown in Panel A to be 0.25. As can be seen in Panel B, however, the correlations between issuer-repurchaser spreads based on sales growth and accruals are 0.72 correlated. In simple terms, some portion of the correlation is driven by the fact that firms with high sales growth also tend to have high accruals; the remainder is explained by investors favoring stocks with high sales growth at the same time that they favor stocks with high accruals. The correlations between almost all of the spreads in Panel B exceed the cross-sectional correlations of the corresponding characteristics, suggesting that investor demand for different characteristics moves together over time.

In Table 10 we carry out a principal components analysis of our eleven issuer-repurchaser spreads. Principal components analysis is a simple way to investigate the commonality of our *ISSREP* series and to understand how sentiment for different characteristics co-moves in the time series. The first set of columns lists the factor loadings of the first three principal components. Reading from the first column, the first principal component is

$$\begin{aligned} PCA_1 = & -0.17 \cdot ISSREP^{B/M} + 0.11 \cdot ISSREP^{\Delta S/S} + 0.12 \cdot ISSREP^{Acc/A} \\ & +0.38 \cdot ISSREP^{ME} + 0.39 \cdot ISSREP^{P} + 0.35 \cdot ISSREP^{Age} - 0.24 \cdot ISSREP^{\beta} \\ & -0.38 \cdot ISSREP^{\sigma} - 0.30 \cdot ISSREP^{SHUM} + 0.38 \cdot ISSREP^{Div} + 0.31 \cdot ISSREP^{E/B}. \end{aligned} \tag{17}$$

The second set of columns lists the pairwise correlations of each characteristic issuer-repurchaser spread with the three common factors. As shown in Table 10, three principal components together capture 87% of the time-series variation of our eleven issuer repurchaser spreads. The first component alone captures 57% of the time-series variation, while the second component captures 22% of the variation.

The first factor primarily reflects demand for characteristics associated with greater "prudence" or "safety". Columns one and four of the table show that when the first factor takes on high values, corporate issuance is tilted towards large, high price, old, low-β, low volatility, low distress, and dividend paying firms. For instance, the correlations between issuer-repurchaser spreads for size and volatility and the first principal component are 0.96 and -0.94, respectively. The natural interpretation is that investors tend to favor these characteristics at the same time. The correlations between the characteristic issuer-repurchaser spreads and the prudence factor are much higher than the average cross-sectional correlations of the characteristics. The table also shows that there is a strong positive relationship between the prudence factor and the issuer-repurchaser spread for profitability.

The second principal component loads on traits related to future and past firm growth. As shown in Table 9, the second principal component loads negatively on the issuer-repurchaser spread for book-to-market and positively on the issuer-repurchaser spreads for sales growth and accruals. In other words, during periods when investors favor firms with low book-to-market ratios, they also favor firms with high sales growth and high accruals. There is also a positive relationship between the issuer-repurchaser spread for profitability and the second principal component.

Next we examine the relationship between our prudence and growth factors and Baker and Wurgler's (2006) aggregate sentiment index (*SENT*).[21] The idea here is that times when demand for many individual characteristics takes on extreme values are also likely to be times when investor sentiment, construed more broadly, is either elevated or depressed. If this true, we

[21] The Baker and Wurgler sentiment index is the first principal component of six proxies for aggregate sentiment: the closed-end fund discount, share turnover, the volume and average first-day returns of IPOs, the equity share in external finance, and the difference in valuations between dividend payers and non-payers. Of these six inputs, only the last one is mechanically related to our issuer-repurchaser spreads.

might expect to find a relationship between *SENT* and our prudence and growth factors. As shown in Figure 4, there is indeed a strong negative correlation between our prudence factor and *SENT* (ρ = -0.60) and a positive correlation between the growth factor and *SENT* (ρ = 0.38). If we regress *SENT* on our first two principle components, we obtain

$$SENT_t = \underset{[0.10]}{0.011} - \underset{[-5.18]}{0.236} \cdot PRUDENCE_t + \underset{[3.16]}{0.231} \cdot GROWTH_t + u_t \tag{18}$$

with R^2=0.48. The relationship is even stronger when both left- and right-hand-side variables are measured in changes.

The broad summary of the above analysis is that investor sentiment is multi-dimensional: Baker and Wurgler's sentiment variable is high either when investor demand for prudence-related traits is low or when demand for growth-related trait is high. The correlation between annual changes in *PRUDENCE* and annual changes in *GROWTH* is -0.45. Thus, these factors tend to move in opposing directions, thereby having reinforcing effects on aggregate sentiment. However, this is not always the case: there are 16 years where *PRUDENCE* and *GROWTH* move in the same direction and thus have opposing effects on *SENT*. For instance, in 2005 there was little change in *SENT*. However, this masked meaningful but offsetting declines in both our prudence and growth factors which decreased by -0.51 and -0.63, respectively.[22] Another interesting example is the dot-com bust period from 2000 to 2003. During this time, Baker and Wurgler's (2006) aggregate sentiment measure falls considerably. Our decomposition of sentiment into prudence and growth is more revealing: the growth factor falls considerably,

[22] Since the common component of our issuer repurchaser spreads is highly correlated with Baker and Wurgler's (2006) sentiment measure, one wonders whether our characteristic-specific sentiment measures have predictive power for returns above and beyond *SENT*. In head-to-head horse-races, *ISSREP* and *SENT* each retain some independent forecasting power for characteristic returns. In summary, sentiment is multi-dimensional, containing both aggregate as well as characteristic-specific components.

while the prudence factor remains approximately flat. Thus, these series capture the widely-held notion that investors oversold growth stocks in the aftermath of the tech bubble.

VII. Conclusion

Firms are well suited to cater to broad patterns of characteristic-based mispricing. When investors demand a particular characteristic, firms may absorb some of that demand by issuing new equity. Similarly, when a particular characteristic is out of favor, firms endowed with that characteristic may repurchase shares. Consistent with this idea, we show that time-series variation in the differences between the attributes of stock issuers and repurchasers forecasts characteristic-related stock returns. Our approach helps forecast returns to portfolios based on book-to-market, size, share price, distress, payout policy, profitability, and industry. Furthermore, these issuer-repurchaser spreads contain information about future returns, even controlling for firms' own issuance and repurchase decisions.

Having established the validity of issuer-repurchaser spreads as proxies for characteristic-specific sentiment, we use these spreads to investigate commonality in characteristic-based mispricing. Our analysis suggests that investor demand for characteristics related to "prudence" or "safety" is correlated over time. We document similar clustering of investor demand among characteristics related to firm growth. Together, these two themes suggest that we view investor sentiment as a multidimensional phenomenon. While demand shifts for prudence-like characteristics are negatively correlated with demand shifts for growth-like characteristics, there are periods of time during which these move in the same direction.

Our work has implications for the large literature that studies the stock market performance of SEOs, IPOs, and recent acquirers. In many of these studies, researchers purge the returns of event firms of size and book-to-market effects. Our findings suggest that this methodology is too conservative, since, for example, low market-to-book firms issue stock just prior to periods when low market-to-book firms in general are going to perform poorly.

We expect our methodology to have other applications outside of stock issuance and repurchase activities. For example, time variation in the attributes of acquirers and target firms may hold similar promise for understanding the full spectrum of corporate arbitrage activity.

One unresolved issue raised by our findings is whether we can measure how aggressively corporations respond to investor demand shocks. The fact that we find so much predictability in characteristic returns suggests that firms only partially lean against mispricing. As pointed out by Greenwood, Hanson, and Stein (2008), if firms have sufficient financial flexibility, then they will fully accommodate demand shocks and there will be little predictability left. On the other hand, if firms are constrained, or if the demand shocks are large relative to balance sheet capital, then firms may respond in the right direction but will not fully counteract the mispricing. Bearing this in mind, it is not surprising that our most robust forecasting results are for book-to-market and size. These are sufficiently broad categories that, when they do become mispriced, it is unlikely that corporate arbitrage would be able to fully eliminate the mispricing.

Appendix: Data Definitions

Details on the construction of the eleven non-industry-based characteristics are below. Where applicable, we provide the relevant Compustat data items from the Fundamentals Annual file. When matching to returns in July of year *t* to June of *t+1*, we follow the Fama and French (1992) convention that accounting variables are measured as of fiscal year ending *t-1*, and market-based variables (*ME*, *P*, β, σ, as well as the market-based components of *SHUM*) are measured as of June of year *t*. However, we label all of these characteristics as year *t-1* for notational convenience. (We obtain very similar results if all market-based variables are instead measured in December of year *t-1*.)

Book-to-market equity (*B/M*): Book equity is stockholder's equity, plus balance sheet deferred taxes (item *TXDB*) and investment tax credits (*ITCB*) each when available, minus preferred stock. For stockholder's equity we use item *SEQ* when available; if *SEQ* is missing we use the book value of common equity (*CEQ*) plus the book value of preferred stock (*PSTK*); finally, we use total assets (*AT*) minus total liabilities (*LT*) minus minority interest (*MIB*). For preferred stock we use redemption value (*PSTKRV*), liquidation value (*PSTKL*), and book value (*PSTK*) in that order. We divide book equity for fiscal years ending in year *t-1* by the value of market equity at the end of December in year *t-1* from CRSP.

Sales Growth ($\Delta S_t/S_{t-1}$): Sales growth is the log change in sales (*SALE*).

Accruals (*Acc/A*): Following Bergstresser and Philippon (2006) we define accruals as

$$(Acc/A)_t = \frac{(\Delta CurrAssets_t - \Delta Cash_t) - (\Delta CurrLiab_t - \Delta STDebt_t - \Delta TaxesPayable_t) - Deprec_t}{(A_t + A_{t-1})/2}.$$

where current assets is Compustat item *ACT*, cash is item *CHE*, current liabilities is item *LCT*, taxes payable is item *TXP*, and depreciation is item *DP*.

Size: Size is market equity (*ME*) at the end of June in year *t*.

Price: Price is the nominal price per share at the end of June in year *t*.

Age: Age is number of years since the first appearance of a firm (PERMCO) on CRSP measured to the nearest month.

Beta (β) and Volatility (σ): Beta and volatility are estimated from a trailing 24-month CAPM regression. We require that a firm has valid returns for at least 12 of the previous 24 months.

Distress (*SHUM***)**: We use the bankruptcy hazard rate estimated by Shumway (2001): $SHUM = \exp(H)/(1-\exp(H))$ where

$$H = -13.303 - 1.982 \cdot NI/A + 3.593 \cdot L/A - 0.467 \cdot RELSIZE - 1.809 \cdot (R - R_M) + 5.791 \cdot \sigma$$

where *NI/A* is net income over period-end assets, *L/A* is total liabilities over assets, *RELSIZE* is the log of a firm's market equity divided by the total capitalization of all NYSE and AMEX stocks, $R - R_M$ is firm's cumulative return over the prior 12-months minus the cumulative return on the value-weighted NYSE/AMEX index, and σ is volatility of residuals from trailing 12-month market-model regression.

Dividends (*Div*)**:** *Div* is a dummy variable equal to one for dividend payers (firms for which *DVPSXF*>0) and zero for nonpayers.

Profitability (*E/B***):** Earnings (*E*) is income before extraordinary available for common (*IBCOM*) plus income statement deferred taxes (*TXDI*) when available. Income is scaled by average book equity where book equity is as defined above.

References

Amihud, Yakov, and Clifford M. Hurvich, 2004, Predictive regressions: A reduced-bias estimation method, *Journal of Financial and Quantitative Analysis* 39, 813-841.

Bagwell, Laurie Simon, and John B. Shoven, 1989, Cash distributions to shareholders, *Journal of Economic Perspectives*, 129-140.

Baker, Malcolm, Robin Greenwood, Jeffrey Wurgler, 2003, The maturity of debt issues and predictable variation in bond returns, *Journal of Financial Economics* 70, 261 – 291.

Baker, Malcolm, Robin Greenwood, Jeffrey Wurgler, 2008, Catering through nominal share prices, forthcoming at the *Journal of Finance*.

Baker, Malcolm, Richard Ruback, and Jeffrey Wurgler, 2007, Behavioral Corporate Finance: A Survey, in Espen Eckbo, ed, *Handbook of Corporate Finance: Empirical Corporate Finance*.

Baker, Malcolm, and Jeremy Stein, 2004, Market liquidity as a sentiment indicator, *Journal of Financial Markets* 7, 271 – 299.

Baker, Malcolm, and Jeffrey Wurgler, 2000, The equity share in new issues and aggregate stock returns, *Journal of Finance* 55, 2219 – 2257.

Baker, Malcolm, and Jeffrey Wurgler, 2004, A catering theory of dividends, *Journal of Finance*,1125-1165.

Banz, Rolf, 1981, The relationship between return and market value of common stocks, *Journal of Financial Economics* 9, 3-18.

Barberis, Nicholas and Andrei Shleifer, 2003, Style investing, *Journal of Financial Economics* 68, 161 – 199.

Benartzi, Shlomo, Roni Michaely, Richard Thaler, and William Weld, 2007, The nominal price puzzle, Working paper.

Bergstresser, Daniel, and Thomas Philippon, 2006, CEO incentives and earnings management, Journal of Financial Economics, 511-529.

Butler Alex, Gustavo Grullon, and James Weston, 2005, *Journal of Finance* 60, 963 – 986.

Carlson, Murray, Adlai Fisher, and Ron Giammarino, 2006, Corporate Investment and Asset Price Dynamics: Implications for SEO Event Studies and Long-Run Performance, *Journal of Finance* 61, 1009 – 1034.

Chan, Louis K, Josef Lakonishok, and Bhaskaran Swaminathan, 2007, Industry classifications and return comovement, *Financial Analysts Journal* 63, 56-71.

Daniel, Kent and Sheridan Titman, 1997, Evidence on the characteristics of cross-sectional variation in stock returns, *Journal of Finance* 52, 1 – 33.

Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wurmers, 1997, Measuring mutual fund performance with characteristic based benchmarks, *Journal of Finance* 52, 1035-1038.

Eckbo, Espen, Ronald Masulis, and Oyvind Norli, 2000, Seasoned public offerings: Resolution of the new issues puzzle, *Journal of Financial Economics* 56, 251-291.

Fama, Eugene F. and Kenneth R. French, 1992, The cross-section of expected stock returns, *Journal of Finance* 47, 427-465.

Fama, Eugene F. and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, 3-56.

Fama, Eugene F. and Kenneth R. French, 1997, Industry costs of equity, *Journal of Financial Economics* 43, 153-193.

Fama, Eugene F. and Kenneth R. French, 2004, New lists: fundamentals and survival rates, *Journal of Financial Economics* 72, 229 – 269.

Fama, Eugene F. and Kenneth R. French, 2005, Financing decisions: who issues stock?, *Journal of Financial Economics*, 76, 549 – 582.

Fama, Eugene F. and Kenneth R. French, 2008a, Dissecting anomalies, Journal of Finance 63, 1653-1678.

Fama, Eugene F. and Kenneth R. French, 2008b, Average returns, B/M, and share issues, Journal of Finance 63, 2971-2995.

Fama, Eugene F. and Kenneth R. French, 2008c, Opportunistic financing, Working paper.

Fama, Eugene F. and James Macbeth, 1973, Risk, return, and equilibrium: Empirical tests, *Journal of Political Economy* 81, 607-636.

Graham, Benjamin, and David Dodd, 1934, *Security Analysis*, McGraw-Hill.

Graham, Benjamin, 1973, *The Intelligent Investor*, 4th ed., Harper & Row.

Graham, John R., and Campbell R. Harvey, 2001, The theory and practice of corporate finance: evidence from the field, *Journal of Financial Economics* 60, 187-243.

Greenwood, Robin, Samuel Hanson, and Jeremy C. Stein, 2008, A gap-filling theory of corporate debt maturity choice, NBER Working Paper Series, No. 14087.

Ikenberry, David, Josef Lakonishok, and Theo Vermaelen, 1995, Market underreaction to open market share repurchases, *Journal of Financial Economics* 39, 181 – 208.

Lamont, Owen A. and Jeremy C. Stein, 2006, Investor sentiment and corporate finance: micro and macro, *American Economic Review Papers and Proceedings* 96, 147 – 151.

Li, Erica X. N., Dmitry Livdan, and Lu Zhang, 2008, Anomalies, forthcoming at *Review of Financial Studies.*

Loughran, Tim and Jay R. Ritter, 1995, The new issues puzzle, *Journal of Finance* 50, 23 – 51.

Loughran, Tim and Jay R. Ritter, 2000, Uniformly least powerful tests of market efficiency, *Journal of Financial Economics* 55, 361-389.

Loughran, Tim and Jay R. Ritter, 2004, Why has IPO underpricing changed over time?, *Financial Management*, 5-37.

Mullainathan, Sendhil, 2000, Thinking through categories, Unpublished Working Paper.

Pontiff, Jeffrey, and Artemiza Woodgate, 2008, Share issuance and cross-sectional returns, *Journal of Finance* 63, 921 – 945.

Schultz, Paul, 2003, Pseudo Market Timing and the Long-Run Underperformance of IPOs, *Journal of Finance* 58, 483–517.

Shumway, Tyler, 2001, Forecasting Bankruptcy More Accurately: A Simple Hazard Model, *Journal of Business* 74, 101-124

Stambaugh, Robert F., 1999, Predictive regressions, *Journal of Financial Economics* 54, 375-421.

Stein, Jeremy C., 1996, Rational capital budgeting in an irrational world, *Journal of Business* 69, 429 – 455.

Stein, Jeremy C., 2005, Why Are Most Funds Open-End? Competition and the Limits of Arbitrage, *Quarterly Journal of Economics* 120, 247-272.

Figure 1. Distribution of split-adjusted share growth. The distribution of percentage changes in split-adjusted shares outstanding in fiscal 1984. Repurchasers are seasoned firms that reduce split-adjusted shares outstanding by more than 0.5% during the fiscal year. Issuers are seasoned firms that increase shares outstanding by more than 10% during the fiscal year. These breakpoints are indicated using dashed lines below. Seasoned firms that are not classified as issuers or repurchasers are classified as "others." The figure does not include new lists, which may have undefined share growth in their first year.

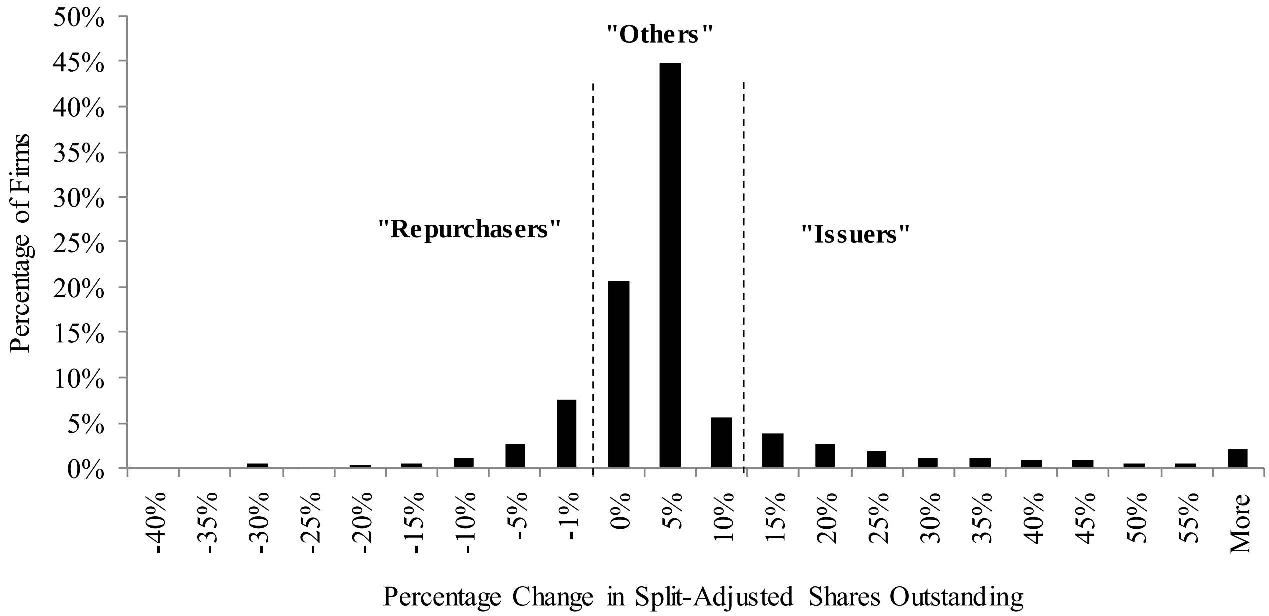


Figure 2. Stock issuers, non-issuers, and repurchasers 1962-2006. The first appearance of a PERMCO on CRSP is classified as a new list. Issuers are seasoned firms that increase split-adjusted shares outstanding by more than 10%. Repurchasers are seasoned firms that reduce split-adjusted shares outstanding by more than -0.5%. Seasoned firms that are not classified as issuers or repurchasers are classified as “others”.

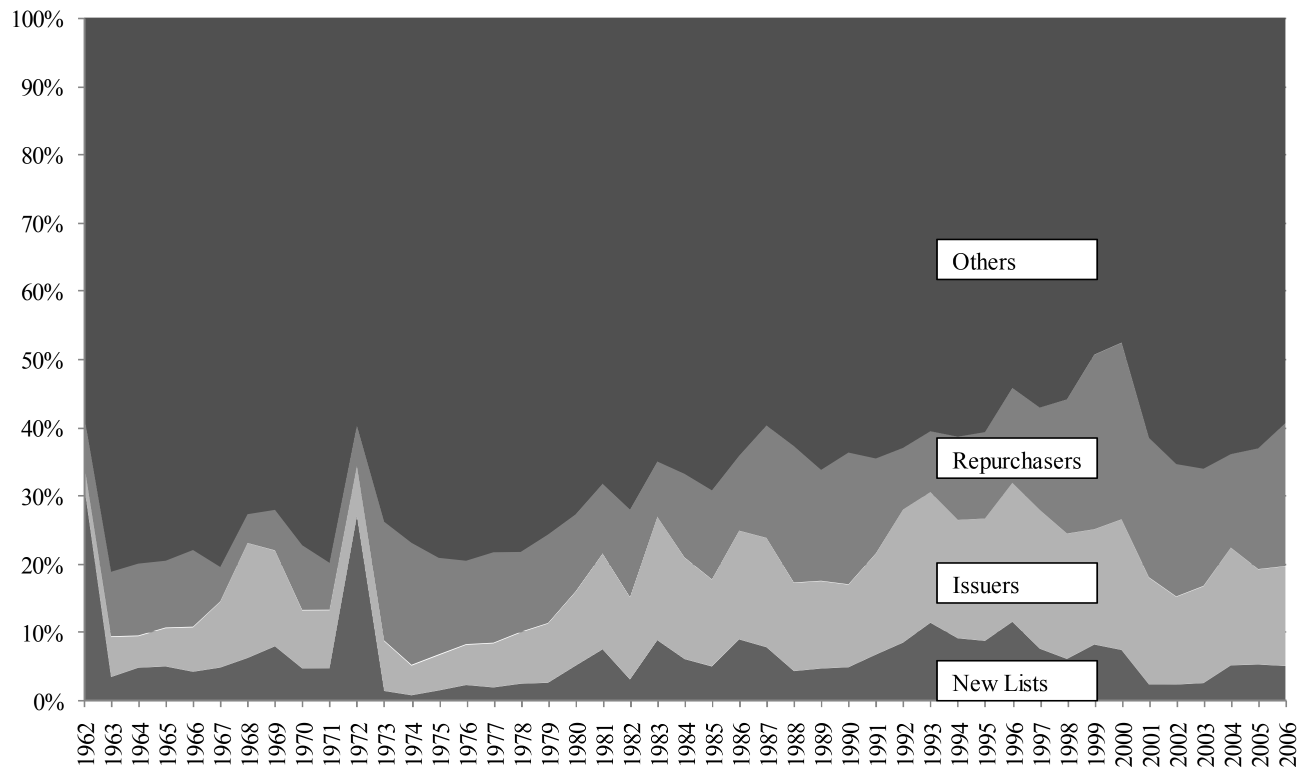
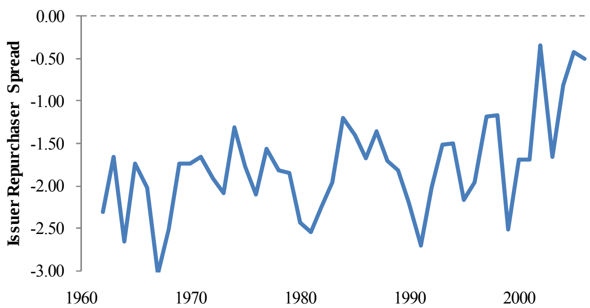
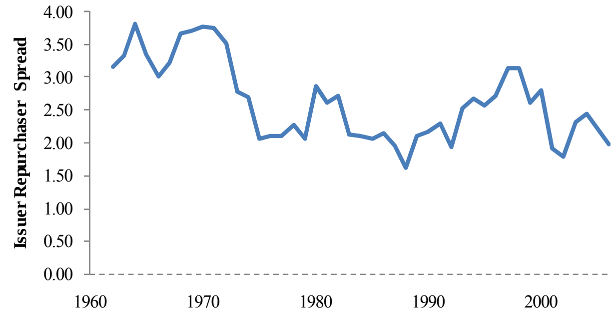


Figure 3. Issuer-repurchaser spreads 1962-2006. We plot the difference between the average characteristics of stock issuers and stock repurchasers. Characteristics include the book-to-market ratio (*B/M*), sales growth (*ΔS/S*), accruals (*Acc/A*), market equity (*ME*), nominal share price (*P*), Age, CAPM beta (*β*), CAPM residual volatility (*σ*), distress (*SHUM*) proxied using the Shumway (2001) bankruptcy hazard rate, dividend policy (*Div*), and profitability (*E/B*). All characteristics except for dividend policy are measured by their NYSE decile rank; dividend policy is a dummy variable that takes a value of one if the firm paid a dividend in that year.

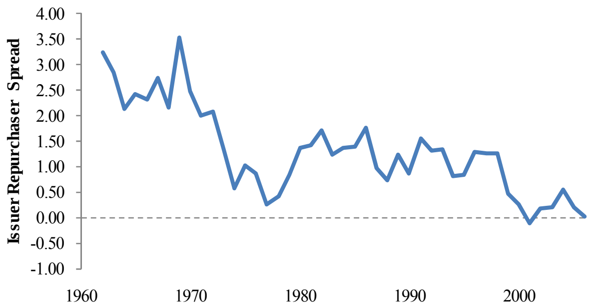
Panel A: Book-to-Market (*B/M*)



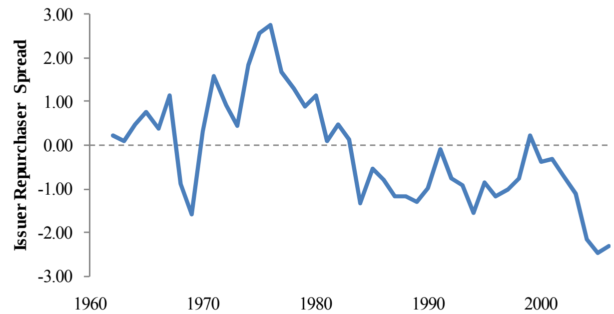
Panel B: Sales Growth (*ΔS/S*)



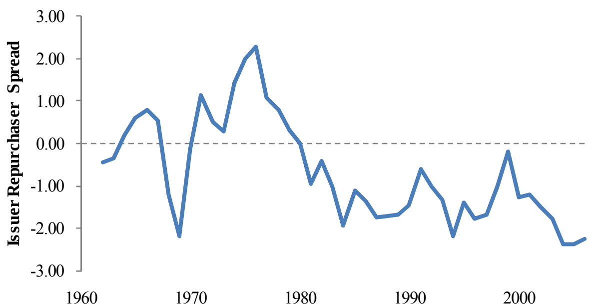
Panel C: Accruals (*Acc/A*)



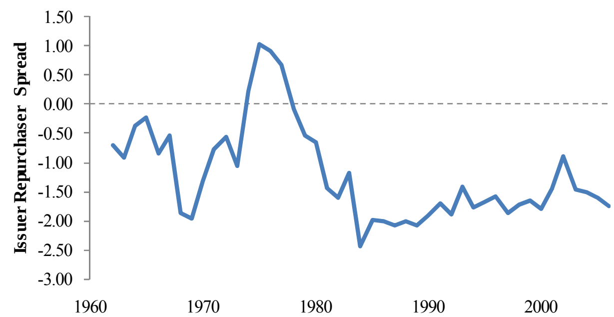
Panel D: Market Equity (*ME*)



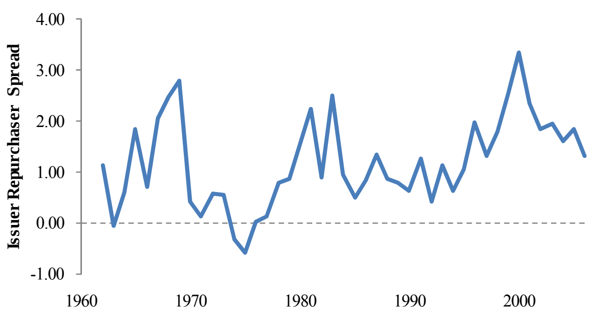
Panel E: Share Price (*P*)



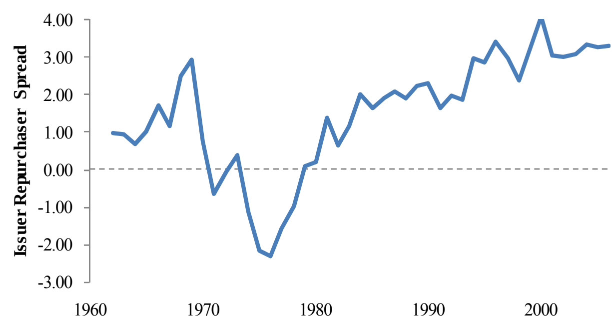
Panel F: Age



Panel G: Beta (*β*)



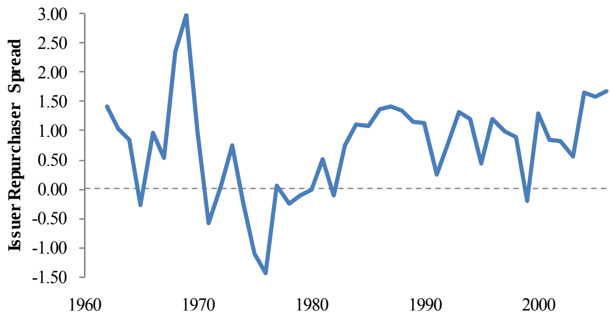
Panel H: Volatility (*σ*)



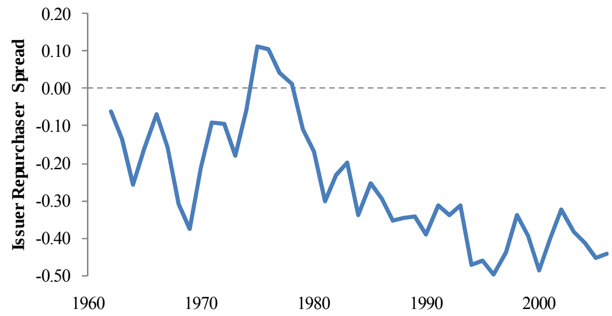
[…continued overleaf]

Figure 3. Issuer-repurchaser spreads 1962-2006 [Continued]

Panel I: Distress (*SHUM*)



Panel J: Dividend policy (*Div*)



Panel K: Profitability (*E/B*)

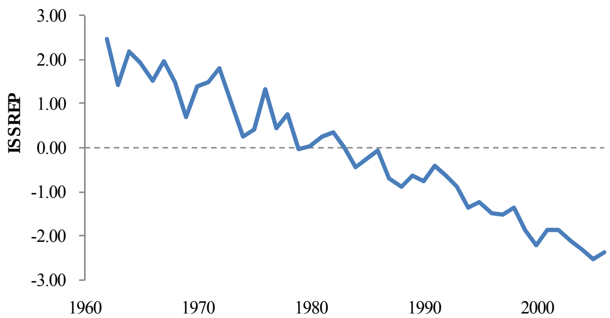
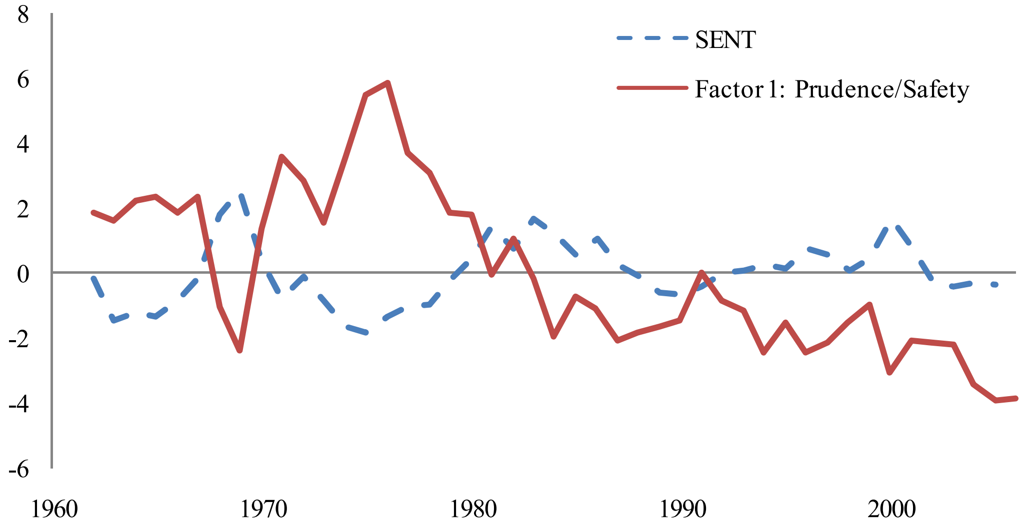


Figure 4. "Bottom-up" characteristic-based measures of investor sentiment 1962-2006.

Panel A. First principal component for 11 *ISSREP* spreads (first principal component- solid; Baker Wurgler (2006) *SENT*- dashed)



Panel B. Second principal component for 11 *ISSREP* spreads (second principal component- solid; Baker Wurgler (2006) *SENT*- dashed)

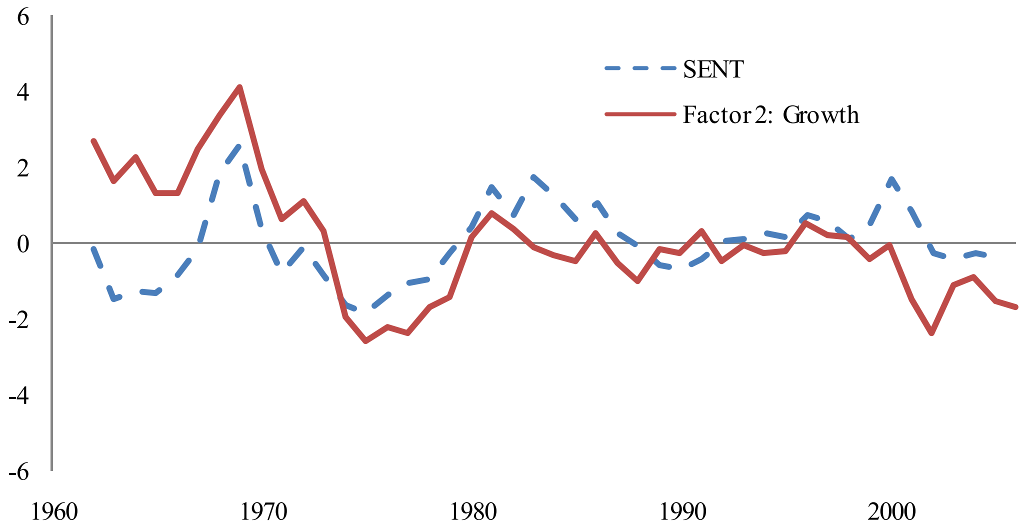


Table 1. Summary Statistics. Mean, median, standard deviation and extreme values of issuance, firm characteristics, and returns. To be included in the sample, the firm must (1) report positive book equity in the fiscal year ending in calendar year *t-1* and (2) have CRSP market equity in June of year *t*. Panel A summarizes net stock issuance (*NS*) defined as the percentage change in split-adjusted shares outstanding from Compustat from year *t-2* to *t-1*. Panel B summarizes firm characteristics, grouped loosely along the themes of growth, prudence, and profitability. Book-to-market (*B/M*) is the ratio of book equity to market equity (shares outstanding times stock price in December of *t-1* from CRSP). Book equity (*B*) is stockholder's equity plus balance sheet deferred taxes and investment tax credit, minus preferred stock calculated according to details in the Appendix. Sales growth ($\Delta S_t/S_{t-1}$) is the percentage increase in sales. Our definitions of accruals (*Acc/A*) follows Bergstresser and Philippon (2006). Market equity (*ME*) is price times shares outstanding in June of year *t* from CRSP. Nominal share price (*P*) is the price in June of year *t*. Age is the number of years since the first appearance of the firm (PERMCO) on CRSP. CAPM beta (β) is the slope coefficient from a regression of excess returns on the value-weighted market excess return (*MKTRF*), estimated using the previous 24-months of data, and requiring at least 12-months of data. Volatility (σ) is the residual standard deviation from this regression. Distress (*SHUM*) is the bankruptcy hazard rate estimated by Shumway (2001). Dividend policy (*Div*) is an indicator that takes a value of one if the firm paid dividends in year *t-1*. Profitability (*E/B*) is income before extraordinary available for common plus income statement deferred taxes all over book equity. All continuous variables in Panels A and B are winsorized in each cross-section at the 0.5 and 99.5 percent levels. Panel C summarizes value-weighted long-short portfolio returns based on the characteristics summarized in Panel B. The construction of these long-short returns follows the Fama and French (1993) procedure for constructing HML and is described in detail in the text. Panel D summarizes other time-series controls, including the Baker and Wurgler (2006) measure of investor sentiment (*SENT*) and an NBER recession dummy.

	N	**Mean**	**Median**	**SD**	**Min**	**Max**
	Panel A: Net Stock Issuance (Firm-years)					
Net stock issuance (*NS*) %	172,693	8.08	0.51	28.59	-35.49	499.23
	Panel B: Characteristics (Firm-years 1962-2006)					
Growth:						
Book-to-Market (*B/M*)	175,111	0.90	0.67	0.87	0.01	12.18
Sales growth ($\Delta S/S_{t-1\,\%}$) %	170,039	14.57	10.70	37.72	-216.56	316.11
Accruals (*Acc/A*) %	147,346	-2.42	-3.02	11.14	-57.06	63.88
Prudence:						
Size (*Log(ME)*)	175,111	4.49	4.34	2.13	-3.23	13.17
Price (*P*)	175,111	18.08	13.25	17.48	0.06	168.50
Age	175,111	13.27	8.42	14.07	0.00	81.00
Beta (β)	169,172	1.13	1.03	1.03	-4.23	7.40
Volatility (σ) %	169,172	13.03	10.87	8.45	2.20	80.35
Distress (*SHUM*) %	155,336	1.99	0.25	7.39	0.00	98.75
Dividend Policy (*Div*)	172,424	0.47	0.00	0.50	0.00	1.00
Profitability:						
Profitability (*E/B*) %	172,477	0.65	10.27	47.97	-647.90	298.53
	Panel C: Characteristic-based portfolio returns (Monthly % July 1963-June 2008)					
Growth:						
B/M (High - Low)	540	0.44	0.42	2.95	-13.94	13.95
$\Delta S/S_{t-1}$ (High - Low)	540	-0.09	-0.07	2.17	-7.35	9.62
Acc/A (High - Low)	540	-0.29	-0.36	1.65	-5.59	6.32
Prudence:						
ME (High - Low)	540	-0.22	-0.04	3.18	-22.38	17.13
P (High - Low)	540	0.04	0.12	3.06	-18.88	9.62
Age (High - Low)	540	-0.01	-0.08	3.96	-15.99	19.33
Beta (β)	540	0.17	0.07	2.79	-17.23	16.49
σ (High - Low)	540	0.07	-0.03	4.72	-18.60	31.16
SHUM (High - Low)	540	-0.14	-0.12	2.93	-9.44	10.80
Div (Payer - Nonpayer)	540	-0.08	0.04	4.35	-21.45	16.36
Profitability:						
E/B (High - Low)	540	0.10	0.07	2.26	-15.70	11.02
	Panel D: Other time-series controls (Annual)					
SENT (1962-2005)	44	0.00	-0.10	1.00	-1.85	2.57
Recession Dummy	45	0.24	0.00	0.43	0.00	1.00

Table 2. Stock issuers, non-issuers, and repurchasers 1962-2006. The first appearance of a PERMCO is classified as a new list. Issuers are seasoned firms that increase shares outstanding by more than 10% during the fiscal year. Repurchasers are seasoned firms that reduce split-adjusted shares outstanding by more than 0.5% during the fiscal year. Seasoned firms that are not classified as issuers or repurchasers are classified as "others." The right-hand columns show the mean change in split-adjusted shares outstanding for firms in each group. Changes in firm shares outstanding are winsorized at the 0.5 and 99.5 percent levels.

Fiscal Year	Counts by firm type					Mean Change in Shares Outstanding (%)		
	All Firms	**New Lists**	**Issuers**	**Repurchasers**	**Others**	**Issuers**	**Repurchasers**	**Others**
1962	1,033	331	31	73	598	22.1	-3.0	0.8
1963	1,149	41	67	110	931	27.1	-3.2	0.8
1964	1,240	61	57	132	990	22.5	-2.7	0.9
1965	1,330	68	74	132	1,056	27.0	-3.1	0.9
1966	1,426	62	92	162	1,110	20.5	-2.6	1.0
1967	1,515	75	145	78	1,217	25.8	-3.1	1.2
1968	1,650	105	276	71	1,198	26.1	-2.9	1.5
1969	1,823	147	254	110	1,312	24.5	-2.5	1.7
1970	1,960	95	165	188	1,512	23.4	-2.6	1.4
1971	2,060	100	174	144	1,642	21.6	-3.0	1.3
1972	2,848	771	209	168	1,700	20.2	-2.7	1.3
1973	3,379	52	245	592	2,490	19.8	-3.9	1.1
1974	3,396	31	146	611	2,608	18.2	-4.5	0.7
1975	3,756	61	192	536	2,967	18.9	-4.8	0.7
1976	3,832	92	224	473	3,043	19.3	-5.9	0.8
1977	3,771	78	241	504	2,948	19.1	-6.2	0.9
1978	3,742	97	279	443	2,923	21.3	-5.9	1.1
1979	3,718	102	320	486	2,810	21.6	-5.6	1.1
1980	3,787	197	407	432	2,751	23.7	-5.5	1.2
1981	3,961	302	551	408	2,700	26.4	-5.1	1.4
1982	4,027	129	481	521	2,896	27.7	-5.9	1.1
1983	4,312	386	776	351	2,799	27.8	-5.5	1.4
1984	4,424	274	654	545	2,951	33.2	-6.8	1.3
1985	4,368	224	552	573	3,019	30.8	-6.5	1.3
1986	4,512	409	714	499	2,890	32.4	-6.0	1.3
1987	4,663	369	743	770	2,781	33.7	-5.8	1.4
1988	4,575	203	588	917	2,867	36.0	-5.7	1.2
1989	4,494	216	572	735	2,971	33.9	-5.3	1.2
1990	4,456	223	536	863	2,834	33.9	-5.5	1.2
1991	4,478	307	658	627	2,886	37.9	-5.0	1.2
1992	4,736	407	919	430	2,980	39.6	-4.4	1.5
1993	5,646	649	1,076	506	3,415	43.9	-4.5	1.7
1994	5,967	551	1,028	731	3,657	42.3	-4.7	1.6
1995	6,146	544	1,096	782	3,724	37.7	-4.4	1.6
1996	6,518	758	1,323	907	3,530	40.8	-4.9	1.8
1997	6,354	490	1,286	955	3,623	37.9	-4.9	1.8
1998	5,906	367	1,079	1,163	3,297	36.9	-5.1	1.8
1999	5,697	474	956	1,460	2,807	33.8	-5.7	1.8
2000	5,485	413	1,044	1,422	2,606	35.2	-5.6	2.1
2001	4,961	124	772	1,017	3,048	33.1	-5.1	1.9
2002	4,626	115	590	901	3,020	29.7	-4.2	1.7
2003	4,440	119	627	766	2,928	30.4	-4.3	1.7
2004	4,408	233	755	606	2,814	31.7	-3.7	2.1
2005	4,318	233	599	766	2,720	32.1	-4.0	2.1
2006	4,218	219	612	886	2,501	30.6	-4.5	2.0

Table 3. Issuer-repurchaser Spreads 1962-2006. The issuer-repurchaser spread for characteristic *X* is the mean NYSE characteristic decile for stock issuers minus the mean NYSE characteristic decile for stock repurchasers. Issuers are seasoned firms that increase shares outstanding by more than 10% during the fiscal year. Repurchasers are seasoned firms that reduce split-adjusted shares outstanding by more than 0.5% during the fiscal year. Characteristics include the book-to-market (*B/M*) ratio, sales growth (*ΔS/S*), accruals (*Acc/A*), Size (*ME*), nominal price (*P*), Age, CAPM beta (β), residual volatility (σ), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All characteristics except for dividend policy are measured by their NYSE decile rank; dividend policy is a dummy variable that takes a value of one if the firm paid a dividend in that year. Characteristics are grouped by theme: growth, prudence, or profitability.

	Growth			Prudence							Profitability
	High-Low	High-Low	High-Low	High-Low	High-Low	High-Low	High-Low	High-Low	High-Low	Payer	High-Low
Year	***B/M***	***ΔS/S***	***Acc/A***	***ME***	***P***	***Age***	β	σ	***SHUM***	***Div***	***E/B***
1962	-2.32	3.17	3.24	0.22	-0.46	-0.70	1.11	0.96	1.42	-0.06	2.47
1963	-1.67	3.34	2.83	0.11	-0.36	-0.92	-0.07	0.93	1.03	-0.13	1.42
1964	-2.67	3.82	2.12	0.48	0.20	-0.38	0.60	0.68	0.83	-0.26	2.18
1965	-1.74	3.36	2.43	0.77	0.59	-0.23	1.84	1.00	-0.29	-0.16	1.94
1966	-2.03	3.01	2.30	0.39	0.80	-0.85	0.71	1.69	0.95	-0.07	1.52
1967	-3.05	3.21	2.73	1.13	0.52	-0.53	2.05	1.16	0.53	-0.16	1.97
1968	-2.52	3.66	2.15	-0.90	-1.21	-1.89	2.46	2.46	2.34	-0.31	1.50
1969	-1.75	3.70	3.53	-1.61	-2.21	-1.98	2.77	2.91	2.98	-0.38	0.69
1970	-1.75	3.76	2.48	0.31	-0.15	-1.33	0.41	0.73	0.99	-0.21	1.39
1971	-1.66	3.75	1.98	1.58	1.15	-0.77	0.11	-0.66	-0.59	-0.09	1.48
1972	-1.93	3.51	2.07	0.91	0.49	-0.58	0.56	-0.08	0.05	-0.09	1.79
1973	-2.10	2.77	1.34	0.46	0.26	-1.06	0.55	0.38	0.74	-0.18	0.98
1974	-1.31	2.69	0.57	1.83	1.43	0.22	-0.32	-1.15	-0.26	-0.06	0.26
1975	-1.78	2.06	1.03	2.58	1.98	1.03	-0.60	-2.17	-1.13	0.11	0.42
1976	-2.11	2.11	0.87	2.76	2.28	0.92	0.00	-2.33	-1.45	0.11	1.33
1977	-1.58	2.11	0.26	1.69	1.07	0.67	0.13	-1.59	0.04	0.04	0.45
1978	-1.82	2.28	0.40	1.30	0.80	-0.10	0.77	-0.99	-0.25	0.01	0.76
1979	-1.86	2.05	0.84	0.88	0.32	-0.55	0.86	0.08	-0.12	-0.11	-0.04
1980	-2.44	2.87	1.36	1.15	-0.02	-0.67	1.54	0.19	-0.01	-0.17	0.03
1981	-2.55	2.61	1.41	0.11	-0.97	-1.45	2.23	1.38	0.50	-0.30	0.24
1982	-2.25	2.71	1.71	0.47	-0.43	-1.62	0.88	0.62	-0.12	-0.23	0.36
1983	-1.97	2.13	1.23	0.11	-1.03	-1.20	2.51	1.14	0.74	-0.20	0.00
1984	-1.20	2.10	1.36	-1.34	-1.96	-2.45	0.94	2.01	1.11	-0.34	-0.44
1985	-1.41	2.05	1.40	-0.53	-1.14	-2.01	0.48	1.61	1.06	-0.26	-0.24

[Continued overleaf]

Table 3. Issuer Characteristics [Continued]

	B/M	*ΔS/S*	*Acc/A*	*ME*	*P*	*Age*	β	σ	*SHUM*	*Div*	*E/B*
1986	-1.69	2.15	1.76	-0.79	-1.38	-2.02	0.82	1.87	1.37	-0.30	-0.06
1987	-1.37	1.95	0.96	-1.19	-1.76	-2.08	1.34	2.06	1.42	-0.35	-0.68
1988	-1.71	1.62	0.72	-1.18	-1.72	-2.03	0.86	1.89	1.35	-0.35	-0.89
1989	-1.83	2.10	1.24	-1.29	-1.68	-2.09	0.78	2.21	1.15	-0.34	-0.64
1990	-2.21	2.16	0.85	-0.99	-1.46	-1.92	0.61	2.30	1.14	-0.39	-0.75
1991	-2.72	2.30	1.55	-0.11	-0.61	-1.71	1.26	1.61	0.23	-0.31	-0.42
1992	-2.03	1.93	1.32	-0.77	-1.03	-1.90	0.40	1.96	0.77	-0.34	-0.64
1993	-1.52	2.52	1.34	-0.91	-1.34	-1.43	1.11	1.83	1.32	-0.31	-0.89
1994	-1.50	2.68	0.81	-1.55	-2.20	-1.78	0.63	2.96	1.20	-0.47	-1.35
1995	-2.18	2.57	0.82	-0.87	-1.42	-1.70	1.05	2.85	0.43	-0.46	-1.23
1996	-1.97	2.71	1.28	-1.18	-1.80	-1.60	1.97	3.41	1.19	-0.50	-1.50
1997	-1.19	3.14	1.25	-1.03	-1.71	-1.88	1.31	2.97	0.99	-0.44	-1.51
1998	-1.17	3.13	1.27	-0.78	-1.03	-1.75	1.78	2.35	0.89	-0.34	-1.37
1999	-2.52	2.62	0.46	0.23	-0.19	-1.67	2.51	3.23	-0.20	-0.39	-1.86
2000	-1.69	2.80	0.24	-0.39	-1.28	-1.80	3.34	4.07	1.29	-0.49	-2.21
2001	-1.70	1.92	-0.12	-0.32	-1.22	-1.44	2.33	3.04	0.83	-0.40	-1.88
2002	-0.35	1.79	0.18	-0.70	-1.51	-0.90	1.84	2.98	0.81	-0.32	-1.86
2003	-1.67	2.32	0.21	-1.12	-1.78	-1.47	1.94	3.08	0.55	-0.38	-2.11
2004	-0.82	2.44	0.54	-2.16	-2.40	-1.51	1.60	3.32	1.66	-0.41	-2.30
2005	-0.44	2.20	0.20	-2.48	-2.39	-1.62	1.84	3.25	1.59	-0.45	-2.53
2006	-0.51	1.97	0.00	-2.31	-2.28	-1.76	1.31	3.28	1.67	-0.44	-2.37
Mean	-1.78	2.62	1.30	-0.16	-0.67	-1.21	1.18	1.50	0.73	-0.26	-0.15
SD	0.58	0.61	0.87	1.23	1.22	0.83	0.88	1.57	0.84	0.16	1.40

Table 4. Correlations among characteristics and issuer-repurchaser spreads. Panel A shows the average cross-sectional correlations between firm characteristics. Firm characteristics include the book-to-market (*B/M*) ratio, sales growth (*ΔS/S*), accruals (*Acc/A*), Size (*ME*), nominal share price (*P*), Age, CAPM beta (*β*), residual volatility (*σ*), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All variables are measured as NYSE deciles, except for dividend policy, which is a dummy variable taking a value of one when a firm paid a dividend. Panel B shows the time-series correlation among issuer-repurchaser spreads based on the same set of characteristics.

	B/M	***ΔS/S***	***Acc/A***	***ME***	***P***	***Age***	***β***	***σ***	***SHUM***	***Div***	***E/B***
Panel A: Average Cross-sectional Correlations between Characteristics											
Growth:											
B/M	1.00										
S/S_{t-1}	-0.29	1.00									
Acc/A	-0.10	0.25	1.00								
Prudence:											
ME	-0.22	0.06	-0.04	1.00							
P	-0.22	0.10	0.00	0.76	1.00						
Age	0.17	-0.19	-0.08	0.42	0.34	1.00					
β	-0.15	0.11	0.05	-0.03	-0.09	-0.11	1.00				
σ	-0.08	0.06	0.01	-0.52	-0.54	-0.37	0.36	1.00			
SHUM	0.27	-0.10	0.00	-0.63	-0.64	-0.26	-0.01	0.32	1.00		
Div	0.09	-0.07	-0.01	0.42	0.48	0.36	-0.22	-0.58	-0.27	1.00	
Profitability:											
E/B	-0.41	0.33	0.19	0.28	0.36	0.01	0.02	-0.19	-0.31	0.22	1.00
Panel B: Time-series Correlations between Issuer-Repurchaser Spreads											
Growth:											
B/M	1.00										
S/S_{t-1}	-0.33	1.00									
Acc/A	-0.45	0.72	1.00								
Prudence:											
ME	-0.45	0.19	0.16	1.00							
P	-0.40	0.23	0.19	0.97	1.00						
Age	-0.15	0.11	0.02	0.85	0.87	1.00					
β	-0.04	0.08	-0.07	-0.44	-0.51	-0.45	1.00				
σ	0.27	-0.08	-0.17	-0.89	-0.88	-0.83	0.68	1.00			
SHUM	0.25	0.10	0.19	-0.83	-0.80	-0.71	0.45	0.72	1.00		
Div	-0.25	0.12	0.26	0.88	0.90	0.85	-0.58	-0.94	-0.65	1.00	
Profitability:											
E/B	-0.55	0.58	0.76	0.65	0.67	0.51	-0.38	-0.67	-0.26	0.73	1.00

Table 5. Forecasting characteristic returns. Regressions of monthly long-short portfolio returns on lagged values of the issuer-repurchaser spread for the corresponding characteristic, controlling for contemporaneous returns on the market (*MKTRF*), the Fama-French factors (*HML* and *SMB*) and a momentum factor (*UMD*):

$$R_t^X = a + b \cdot ISSREP_{t-1}^X + c \cdot MKTRF_t + d \cdot HML_t + e \cdot SMB_t + f \cdot UMD_t + u_t$$

The univariate regressions in panel A are estimated excluding the controls. The sample period includes monthly returns from July 1963 to June 2008. The long-short portfolios are formed based on firm characteristics: the book-to-market (*B/M*) ratio, sales growth (*ΔS/S*), accruals (*Acc/A*), Size (*ME*), nominal share price (*P*), Age, CAPM beta (β), residual volatility (σ), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All characteristics except for dividend policy are measures as their NYSE decile rank; dividend policy is measured by a dummy variable that takes a value of one if the firm paid a dividend in year *t-1*. In the table, characteristics are grouped by theme: growth, prudence, or profitability. Monthly returns between July of year *t* and June of year *t+1* are matched to the issuer-repurchaser spread in year *t-1*. Since $ISSREP_{t-1}$ is only refreshed annually, standard errors are clustered by 12-month blocks running from July *t* to June *t+1*. The corresponding *t*-statistics are shown in brackets.

	Panel A: Univariate				Panel B: Multivariate			
	1963-2007		1973-2007		1963-2007		1973-2007	
	b	**[t]**	**b**	**[t]**	**b**	**[t]**	**b**	**[t]**
Growth:								
B/M	-0.713	[-2.69]	-0.815	[-2.29]	-0.631	[-2.65]	-0.761	[-2.50]
$\Delta S/S_{t-1}$	0.075	[0.59]	-0.198	[-0.79]	0.170	[1.30]	0.058	[0.32]
Acc/A	-0.021	[-0.23]	-0.088	[-0.64]	-0.031	[-0.38]	-0.079	[-0.53]
Prudence:								
ME	-0.214	[-1.60]	-0.316	[-3.65]	-0.312	[-2.72]	-0.404	[-5.04]
P	-0.260	[-3.18]	-0.336	[-4.03]	-0.099	[-1.30]	-0.082	[-1.21]
Age	-0.134	[-0.95]	-0.113	[-0.78]	-0.119	[-1.39]	-0.081	[-0.99]
β	-0.270	[-0.96]	-0.401	[-1.24]	-0.261	[-1.83]	-0.303	[-1.80]
σ	-0.078	[-0.51]	-0.127	[-0.96]	-0.066	[-0.76]	-0.043	[-0.50]
SHUM	-0.381	[-1.68]	-0.624	[-2.93]	-0.170	[-1.29]	-0.218	[-1.79]
Div	-1.407	[-1.13]	-2.332	[-2.27]	-0.795	[-1.17]	-1.301	[-1.92]
Profitability:								
E/B	-0.133	[-1.69]	-0.224	[-1.86]	-0.110	[-1.12]	-0.163	[-1.12]

Table 6. Forecasting issuance purged characteristic returns. Regressions of monthly long-short portfolio returns on lagged values of the issuer-repurchaser spread for the corresponding characteristic, controlling for contemporaneous returns on the market (*MKTRF*), the Fama-French factors (*HML* and *SMB*) and a momentum factor (*UMD*):

$$R_t^X = a + b \cdot ISSREP_{t-1}^X + c \cdot MKTRF_t + d \cdot HML_t + e \cdot SMB_t + f \cdot UMD_t + u_t$$

The long-short portfolios are computed using only the subset of seasoned firms that did not issue or repurchase stock in the prior fiscal year. The univariate regressions in panel A are estimated excluding the controls. The sample period includes monthly returns from July 1963 to June 2008. The long-short portfolios are formed based on firm characteristics: the book-to-market (*B/M*) ratio, sales growth ($\Delta S/S$), accruals (*Acc/A*), Size (*ME*), nominal share price (*P*), Age, CAPM beta (β), residual volatility (σ), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All characteristics except for dividend policy are measures as their NYSE decile rank; dividend policy is measured by a dummy variable that takes a value of one if the firm paid a dividend in that year. In the table, characteristics are grouped by theme: growth, prudence, or profitability. Monthly returns between July of year *t* and June of year *t+1* are matched to the issuer-repurchaser spread in year *t-1*. Since $ISSREP_{t-1}$ is only refreshed annually, standard errors are clustered by 12-month blocks running from July *t* to June *t+1*. The corresponding *t*-statistics shown are in brackets.

	Panel A: Univariate Forecasts of Purged Returns				Panel B: Multivariate forecasts of Purged Returns			
	1963-2007		1973-2007		1963-2007		1973-2007	
	b	**[t]**	**b**	**[t]**	**b**	**[t]**	**b**	**[t]**
Growth:								
B/M	-0.607	[-2.42]	-0.678	[-2.02]	-0.514	[-2.29]	-0.609	[-2.10]
$\Delta S/S_{t-1}$	0.162	[1.25]	0.009	[0.03]	0.235	[1.94]	0.234	[1.19]
Acc/A	0.040	[0.44]	0.023	[0.15]	0.033	[0.38]	0.031	[0.19]
Prudence:								
ME	-0.223	[-1.61]	-0.338	[-3.71]	-0.311	[-2.60]	-0.415	[-4.88]
P	-0.233	[-2.71]	-0.325	[-3.53]	-0.082	[-1.14]	-0.081	[-1.17]
Age	-0.034	[-0.29]	-0.004	[-0.03]	-0.009	[-0.14]	0.029	[0.43]
β	-0.187	[-0.70]	-0.317	[-1.04]	-0.179	[-1.28]	-0.220	[-1.35]
σ	-0.007	[-0.05]	-0.053	[-0.45]	0.007	[0.10]	0.028	[0.37]
SHUM	-0.372	[-1.56]	-0.669	[-2.65]	-0.151	[-1.18]	-0.248	[-2.16]
Div	-0.667	[-0.54]	-1.494	[-1.50]	-0.096	[-0.15]	-0.584	[-0.94]
Profitability:								
E/B	-0.003	[-0.05]	-0.064	[-0.71]	0.024	[0.32]	0.001	[0.00]

Table 7. Forecasting issuance purged industry characteristic returns. Estimates of pooled panel regressions forecasting monthly industry-level stock returns:

$$R_{j,t} = a_t + b \cdot NS_{j,t-1} + c \cdot BM_{j,t-1} + d \cdot ME_{j,t-1} + e \cdot MOM_{j,t-1} + f \cdot \beta_{j,t-1} + u_{j,t}$$

R is the value-weighted return to stocks in industry *j*. Industry returns are constructed using only the subset of seasoned firms that did not issue or repurchase stock in the prior fiscal year. The independent variables, all lagged, include the value-weighted averages of net share issuance (*NS*) and book-to-market ratio (*BM*) for stocks in that industry, the log market capitalization of stocks in industry *j* (*ME*), the industry's cumulative returns between months *t-13* to *t-2* (*MOM*), and the industry's market beta (β). Industry definitions follow Fama and French (1997). All regressions include month fixed effects and standard errors are clustered at the month level. In Panel A, all right-hand-side variables are continuous. In Panel B, all right-hand-side variables are measured by their industry ranks. The table only reports the coefficient *b* and its associated t-statistic.

Panel A: *NS* = value-weighted industry net share issuance

	1964-2007				1973-2007			
b	-0.019	-0.020	-0.024	-0.019	-0.015	-0.015	-0.020	-0.017
[t]	[2.16]	[2.23]	[2.42]	[2.03]	[1.57]	[1.66]	[1.93]	[1.68]
Year Effects:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects:	No	No	Yes	Yes	No	No	Yes	Yes
Controls:	No	Yes	No	Yes	No	Yes	No	Yes
R-squared:	0.494	0.497	0.495	0.498	0.491	0.493	0.492	0.494

Panel B: *NS* = Rank of value-weighted industry net share issuance

	1964-2007				1973-2007			
b	-0.835	-0.752	-1.194	-0.914	-0.755	-0.695	-1.227	-0.973
[t]	[2.74]	[2.60]	[3.46]	[2.75]	[2.25]	[2.13]	[3.05]	[2.51]
Year Effects:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects:	No	No	Yes	Yes	No	No	Yes	Yes
Controls:	No	Yes	No	Yes	No	Yes	No	Yes
R-squared:	0.495	0.497	0.495	0.498	0.491	0.493	0.492	0.494

Table 8. Two-stage panel forecasts of characteristic returns. In the first stage, we estimate annual cross-sectional regressions of net issuance *NS* on characteristic decile *X*:

$$NS_{i,t-1} = \theta_{t-1} + \delta_{t-1}^{X} \cdot X_{i,t-1} + \varepsilon_{i,t-1}$$

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + b_2 \cdot (\delta_{t-1}^{X} \times X_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t}$$

The first stage regressions yield a series of annual estimates of δ^X, the issuance tilt with respect to characteristic *X*. In the second stage, we run a panel regression of annual stock returns on lagged values of net issuance, lagged values of the characteristic, interactions of the characteristic with issuance tilt δ^X, and a year fixed effect (a_t). The table shows estimates of b_2, the coefficient on the interaction term. In Panel B, the panel regressions also include controls for lagged β, book-to-market, size, and momentum. The sample period includes annual returns from 1963 to 2007. Annual returns from July of year *t* and June of *t+1* are matched to characteristics in year *t-1*. Firm characteristics include the book-to-market (*B/M*) ratio, sales growth (*ΔS/S*), accruals (*Acc/A*), Size (*ME*), nominal share price (*P*), Age, CAPM beta (β), residual volatility (σ), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All characteristics except for dividend policy are measured as their NYSE decile rank; dividend policy is a dummy variable that takes a value of one if the firm paid a dividend in that year. Standard errors are clustered by year with the corresponding *t*-statistics in brackets.

	Panel A: Baseline Panel Results				Panel B: Controls for β, B/M, Size, and Momentum			
	1963-2007		1973-2007		1963-2007		1973-2007	
X	**b_2**	**[t]**	**b_2**	**[t]**	**b_2**	**[t]**	**b_2**	**[t]**
Growth:								
B/M	-0.977	[-2.99]	-1.053	[-2.91]	-1.005	[-3.19]	-1.068	[-3.03]
$\Delta S/S_{t-1}$	-0.216	[-1.15]	-0.218	[-1.12]	-0.241	[-1.34]	-0.247	[-1.32]
Acc/A	-0.331	[-1.79]	-0.340	[-1.79]	-0.272	[-1.43]	-0.281	[-1.44]
Prudence:								
ME	-0.859	[-2.08]	-0.863	[-2.05]	-0.757	[-1.88]	-0.771	[-1.86]
P	-0.822	[-2.14]	-0.810	[-2.04]	-0.677	[-1.83]	-0.670	[-1.73]
Age	-0.228	[-1.80]	-0.212	[-1.60]	-0.217	[-1.74]	-0.205	[-1.58]
β	-1.154	[-1.45]	-1.171	[-1.43]	-0.961	[-1.16]	-1.012	[-1.20]
σ	-0.774	[-1.42]	-0.777	[-1.39]	-0.619	[-1.16]	-0.645	[-1.19]
SHUM	-1.537	[-2.13]	-1.527	[-2.08]	-1.421	[-2.04]	-1.425	[-2.01]
Div	-0.572	[-1.65]	-0.574	[-1.61]	-0.499	[-1.46]	-0.506	[-1.44]
Profitability:								
E/B	-0.491	[-1.22]	-0.542	[-1.30]	-0.404	[-1.06]	-0.487	[-1.25]

Table 9. The economic significance of characteristic timing for corporate issuance. Daniel, Grinblatt, Titman and Wermers (1997) type decomposition of the returns to portfolios that are long low net issuance stocks and short high net issuance stocks. The portfolios are long stocks in the lowest NYSE net issuance decile and short stocks in the highest net issuance decile. Each stock in the portfolio is matched to one of 25 benchmark portfolios based on size and book-to-market. These benchmark portfolios are constructed using only the subset of seasoned firms that did not issue or repurchase stock in the prior fiscal year. The characteristic selectivity (*CS*) return is the difference between the portfolio return and the weighted return on the matched benchmarks portfolios. The average style (*AS*) return is the return on a benchmark portfolio that reflects the average size and B/M composition of the net issuance portfolio. The characteristic timing (*CT*) return captures deviations of the current size and B/M composition of the portfolio from its long-run average. The table shows results for both value- and equal-weighted portfolios based on net issuance, for both the full sample and the 1973-2007 sub-period. In each panel, the right-most column shows the fraction of the total return to the long-short net issuance portfolio that is due to characteristic timing.

	1963-2007					1973-2007				
	% per annum					% per annum				
	R	**= CS**	**+ AS**	**+ CT**	**CT/R**	**R**	**= CS**	**+ AS**	**+ CT**	**CT/R**
VW	9.23	7.39	-0.08	1.92	0.208	9.05	7.26	-0.09	1.89	0.209
	[4.42]	[4.56]	[0.30]	[2.24]		[3.73]	[3.78]	[0.32]	[2.04]	
EW	11.25	7.41	2.14	1.69	0.150	12.14	7.90	2.27	1.97	0.162
	[5.67]	[5.01]	[4.12]	[2.92]		[5.06]	[4.42]	[3.64]	[3.13]	

Table 10. Component loadings for first three principal components of issuer-repurchaser spreads. First, second, and third principal components of eleven characteristic issuer-repurchaser spreads. Firm characteristics include the book-to-market (*B/M*) ratio, sales growth (*ΔS/S*), accruals (*Acc/A*), Size (*ME*), nominal share price (*P*), Age, CAPM beta (β), residual volatility (σ), the Shumway bankruptcy hazard rate (*SHUM*), dividend policy (*Div*), and profitability (*E/B*). All variables are measured as NYSE deciles, except for dividend policy, which is a dummy variable taking a value of one when a firm paid a dividend. The first three columns list the factor loading defining the three principal components. The next three columns list the correlations of the relevant issuer-repurchaser spread with the principal components.

	Factor Loading			Correlations with Factors		
	1st Principal Component	2nd Principal Component	3rd Principal Component	1st Principal Component	2nd Principal Component	3rd Principal Component
	(1)	(2)	(3)	(4)	(5)	(6)
Growth:						
B/M	-0.17	**-0.33**	0.60	-0.43	**-0.50**	-0.58
S/S_{t-1}	0.11	**0.52**	0.05	0.26	**0.80**	-0.05
Acc/A	0.12	**0.57**	0.23	0.31	**0.88**	-0.23
Prudence:						
ME	**0.38**	-0.06	-0.22	**0.96**	-0.10	0.21
P	**0.39**	-0.05	-0.12	**0.97**	-0.08	0.11
Age	**0.35**	-0.16	-0.03	**0.86**	-0.25	0.03
β	**-0.24**	0.18	-0.60	**-0.59**	0.28	0.59
σ	**-0.38**	0.11	-0.14	**-0.94**	0.17	0.14
SHUM	**-0.30**	0.29	0.31	**-0.76**	0.44	-0.30
Div	**0.38**	-0.06	0.15	**0.94**	-0.09	-0.14
Profitability:						
E/B	**0.31**	**0.36**	0.15	**0.78**	**0.56**	-0.15
Variance Share	0.57	0.22	0.09			
Cumulative Variance Share	0.57	0.78	0.87			