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Characteristic Timing

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Abstract

We use differences between the attributes of stock issuers and repurchasers to forecast characteristic-related stock returns. For example, we show that large firms underperform following years when issuing firms are large relative to repurchasing firms. Our approach is useful for forecasting returns to portfolios based on book-to-market (HML), size (SMB), price, distress, payout policy, profitability, and industry. We consider interpretations of these results based on both time-varying risk premia and mispricing. Our results are primarily consistent with the view that firms issue and repurchase shares to exploit time-varying characteristic mispricing.

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I. Introduction

It is well known that firms that issue stock subsequently earn low 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 managers exploit private information about the firm's 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.

In this paper, we put forth a complementary interpretation of these results: firms issue and repurchase shares to exploit time-varying characteristic mispricing. We show that firms issue prior to periods in which their characteristics perform poorly, and repurchase prior to periods when their characteristics perform well. Our empirical design relies on two assumptions. First, firm characteristics – such as the book-to-market ratio, sales growth, dividend policy, or industry affiliation – may be correlated with future returns in the cross-section. This assumption receives considerable support in the vast empirical literature on stock returns (e.g., Daniel and Titman 1997). Second, characteristic-based expected returns may vary over time. Variation in expected characteristic returns may be driven by time-varying risk premia, or they may be driven by characteristic-level mispricing. In the latter case, we might interpret characteristic-level mispricing as stemming from time-varying investor enthusiasm for different themes. Together, these assumptions amount to saying that stock returns can be described by a *conditional characteristics* model.

How should firms respond to predictable variation in characteristic returns? If this variation reflects mispricing, firms endowed with a characteristic with low expected returns can exploit this by selling shares or undertaking stock-financed acquisitions. This activity advantages firms' existing long-term shareholders at the expense of short-term investors who buy shares which subsequently underperform. Likewise, firms endowed with a characteristic with high expected returns may decide to repurchase existing shares. Why do firms undertake trades of this sort? Relative to professional arbitrageurs, firms may be advantaged when mispricing converges slowly or is associated with undiversifiable risk (e.g., Shleifer and Vishny 1997; Stein 2005).

Following the logic above, differences between the attributes of recent issuers and repurchasers can be used to forecast characteristic-level returns. So, for example, if we were to observe that recent issuers were predominately firms with characteristic *X*, we might reasonably infer that returns of firms with characteristic *X* would subsequently be low. As we discuss below, the characteristics of recent issuers might be useful for forecasting characteristic returns even if this is driven solely by rational variation in risk premia.

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 *any* characteristic, we limit ourselves to traits which have appeared 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, and profitability. In selecting these characteristics, we hope to capture some of the salient dimensions along which investors categorize 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). 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 appear to be 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

[1] Among the characteristics listed above, book-to-market, size, nominal share price, dividend payout policy, and industry stand out as being most relevant from the perspective of investor categorization. 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 investment 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.

underperformance of net-issuers as a primitive fact, then it might not be surprising to find that HML performs well when growth 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 construct long-short characteristic portfolios that exclude the issuing and repurchasing firms. We achieve essentially similar results using these “issuer-purged” portfolios. In summary, net issuance forecasts the returns of non-issuing firms with similar characteristics. 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.

An important question is whether our results are consistent with market efficiency. We consider two potential explanations. The first is that, because equity issues have the effect of delevering the firm’s assets, the required returns on equity falls mechanically post issuance through a Modigliani and Miller (1958) channel. A variation of this explanation is that issuance causes lower returns because firms convert growth options into assets in place when they decide to invest (Carlson, Fisher, Giammarino 2004). Because growth options are riskier than installed assets, required returns fall post-issuance. These explanations are unable to account for our results because issuer-repurchaser spreads forecast characteristic returns for firms that *do not issue or repurchase*.

A second potential explanation is that issuance is a noisy proxy for investment which responds to time variation in rationally required returns. Specifically, when rationally required returns decline, firms will invest more and some of this investment will be financed with additional equity. Under this explanation, issuer-repurchaser spreads forecast characteristic returns because a higher value of the characteristic among issuing firms is associated with lower required returns. However, in this case, the difference in characteristics between firms with high and low levels of investment should be a better forecaster of returns than the issuer-repurchaser spread. In univariate regressions these investment-based measures have some modest ability to predict characteristic-level returns. However, in horse races with our issuer-repurchaser spreads, the issuer-repurchaser spreads generally remain significant while the investment-based measures often enter with the wrong sign and are rarely statistically insignificant.

In summary, the evidence is primarily consistent with the view that issuance and repurchase activity is partly an attempt to exploit time-varying characteristic mispricing, suggesting that firms may play a role as arbitrageurs in the capital market. We stress, however, that our forecasting results are useful even if they are consistent with some forms of market efficiency, since they help us forecast time-series variation in returns at the characteristic level. For instance, other than Cohen, Polk, and Vuolteenaho (2003), we know of no other paper that has had much empirical success forecasting HML or SMB.

Given these results, we ask what fraction of the underperformance of recent issuers can be explained by characteristic timing. If firms only respond weakly to time-varying expected characteristic returns, characteristic timing might be relatively unimportant from a corporate finance standpoint, although still useful for forecasting returns. Our estimates suggest that at least one fifth of the underperformance of recent issuers is due to characteristic timing.

The paper proceeds as follows. In the next section, we lay out an empirical model of characteristic timing. Section III describes the construction of our characteristic issuer-repurchaser spread measures. In Section IV, we use issuer-repurchaser spreads to forecast returns. Section V considers whether the results are consistent with market efficiency, or whether they are better explained by the view that firms time their issuance to exploit mispriced characteristics. Section VI evaluates the economic importance of characteristic timing from the point of view of corporate issuance. The final section concludes.

II. Empirical strategy

We develop a framework to motivate our empirical strategy, which uses patterns in corporate issuance to identify time-variation in characteristic expected returns. We assume that expected returns are given by a conditional characteristics model:

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

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. We emphasize that at this point it makes no difference if we interpret time-series variation in expected characteristic returns as reflecting mispricing (in which case they are deviations from rationally required returns) or if (1) describes investors' required returns. In the first case, equation (1) can be seen as 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. Baker and Wurgler (2006) use a similar empirical specification to study the role of time-varying investor sentiment. Equation (1) can also be interpreted within the context of rationally time-varying risk premia: in this case, we assume that characteristic X is related to the firm's loading on some risk factor whose price of risk (T) varies over time.

To keep matters simple, we write equation (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 $X_{i,t-1}$ and T_{t-1} are independent. $\mu_{i,t-1}$ 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.

We assume that corporations issue stock when expected returns are low and repurchase when expected returns are high. Thus, net stock issuance (*NS*) is given by

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

where $\varepsilon_{i,t-1}$ is independently distributed across time and firms. We assume a unit elasticity of net issuance with respect to expected returns for simplicity only. Equation (2) can be seen as a reduced form representation of the idea that managers derive some benefit from issuing overpriced equity (and likewise, benefit from repurchasing underpriced equity).[2] Under this interpretation, the noise term ε captures all factors other than market timing that may influence net stock issuance. For example, some firms might like to exploit mispricing, but can or do not for idiosyncratic reasons. The larger is the variance of ε, the smaller is the role of market timing in explaining net stock issuance.[3] Equation (2) can also be interpreted within a fully rational paradigm in which firms invest more and, hence, issue more equity when rationally required returns fall. In this case, the noise term ε captures the fact that equity issuance is only a noisy signal of investment because it reflects a series of uninformative decisions about how that investment should be financed. In the Appendix, we present a short model in the spirit of Stein (1996) that motivates equation (2) and nests rational interpretations and interpretations based on

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[2] 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.

[3] For simplicity, equation (2) does not consider feedback effects of issuance on future returns. In Greenwood, Hanson, and Stein (2010), 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.

mispricing. Specifically, in this model, issuance is negatively related to both mispricing and to rational time-varying returns.

Substituting (1) into (2), we have

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

Equation (3) says that issuance will respond to market-wide, characteristic-specific, and firm-specific expected returns. 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

$$\delta_{t-1} = -(\beta_1 + \beta_2 \cdot T_{t-1}), \quad (4)$$

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 reveal time variation in characteristic expected returns 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 characteristic-level expected returns.

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 previous discussion suggests a refinement. We can use the net issuance of firms that have the same characteristics as Google to back-out Google's expected return. Such information is captured by δ_{t-1}.

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 expected returns (T_{t-1}):

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + b_2 \cdot (T_{t-1} \times X_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t} \tag{5}$$

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

$$b_2 = \beta_2 \frac{\sigma_\varepsilon^2}{\sigma_\mu^2 + \sigma_\varepsilon^2}. \tag{6}$$

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

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 expected returns 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%. 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). Figure 1 illustrates the breakdown of *NS* into these three groups by showing the histogram of net issuance of public firms in 1984. Table 2 summarizes the 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.

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 (or cross-sectional decile for) characteristic *X* in year *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:

$$ISSREP_{t-1}^{X} = \frac{\sum_{i \in Issuers} X_{i,t-1}}{N_{t-1}^{Issuers}} - \frac{\sum_{i \in Repurchasers} X_{i,t-1}}{N_{t-1}^{Repurchasers}} \qquad (7)$$

where cross-sectional *X*-deciles for each year are based on NYSE breakpoints. For instance, if we consider size (*ME*), then $ISSREP_{t-1}^{ME} = 1$ indicates that issuing firms were on average one size decile larger than repurchasing firms in year *t-1*. 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)*. These characteristics capture themes related to growth and growth opportunities (*B/M*, $\Delta S_t / S_{t-1}$, *Acc/A*), size and/or safety (*ME*, *P*, Age, β, σ, *SHUM*, *Div*), and profitability (*E/B*). 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 the conditional expected returns associated with its characteristics. Not surprisingly, spreads based on the characteristics of new lists are correlated with measures we compute in (7).[4]

Although we examine a variety of characteristics, a priori one might expect our approach to work better for some characteristics than for others. One issue is that in order for $ISSREP^X$ to forecast returns associated with characteristic *X*, any time variation in expected returns must be sufficiently persistent for corporate managers to be able to act on it in a reasonable time-frame. For instance, under the characteristic mispricing interpretation, there may be a delay between the recognition of mispricing and managers' ability to issue more equity. Thus, we would be surprised to find firms 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 changes in expected returns 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 two 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 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.

[4] 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.

B. Discussion

Figure 2 plots and Table 1 summarizes issuer-repurchaser spreads for each of the eleven characteristics. Panel A of Table 3 lists the average cross-sectional correlations between our eleven characteristics (in decile form) and Panel B of Table 3 summarizes the time-series correlations between the eleven issuer-repurchaser spreads.

From Table 1, the average value of the issuer-repurchaser spread for book-to-market is -1.78 deciles and is always negative, as issuers are disproportionately growth firms throughout the sample. More importantly for our purposes, Panel A of Figure 2 shows that the issuer-repurchaser spread for book-to-market exhibits 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 throughout the remainder of the 1980s. It then 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 on average. Panel B of Figure 2 suggests that issuance was particularly tilted toward firms with high sales growth 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 ($\rho = 0.72$).

As shown in Panel B of Table 3, 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 2, issuance was tilted toward small firms in the late 1960s and toward large firms during the "nifty-fifty" period of the early 1970s when large firms were popular with investors. 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.

As shown in Panel F of Figure 2, 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 highly correlated in the time-series (ρ = 0.68). While the issuer repurchaser spread for beta is usually positive, Panel G shows that issuance was particularly 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.

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 2, issuers typically face higher bankruptcy risks than repurchasers. Issuance was tilted towards firms with high bankruptcy risk during the late 1960s and early 1970s, with the pattern reversing in the mid-1970s. Not surprisingly, there is some tendency for the issuer-repurchaser spread for distress to decline during recessions.

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.

Last, consistent with the findings in Fama and French (2004), Panel K of Figure 2 shows that there is a steady downward trend in the profitability of issuers relative to repurchasers.

IV. Results

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 4 shows the results from our baseline forecasting regression:

$$R_t^X = a + b \cdot ISSREP_{t-1}^X + u_t \quad (8)$$

where R^X denotes the return on a portfolio that buys firms with high values of characteristic *X* and sells short firms with low values of *X*. The construction of these portfolios follows the Fama and French (1993) procedure for constructing HML.[5] For example, if the characteristic in

[5] 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

question is *B/M*, then R^X is simply the return on the Fama and French HML portfolio. For the size (*ME*) characteristic, R^X is negative one times SMB. We follow the usual timing convention that issuer-repurchase spreads for fiscal-years ending in calendar year *t-1* are matched to monthly returns between July of year *t* and June of year *t+1*. In these monthly regressions, the $ISSREP^X$ predictor is measured annually, so standard errors are clustered by portfolio formation year.

Panel A of Table 4 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 book-to-market relative to repurchasers, subsequent returns to HML are poor. Likewise, when issuers are particularly small relative to repurchasers, subsequent returns on SMB are low. 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.[6] However, consistent with the previous discussion, we typically find the strongest predictability for characteristics that are more persistent at the firm level, such as *B/M*, size, price, and dividend policy.

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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. For size, we use R^{ME} = -SMB, while for dividend policy we use $R^{Div} = (R_{Pay} - R_{NoPay})$ where, for instance, R_{Pay} is the value-weighted return on dividend-paying stocks.

[6]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.

The predictability documented in Table 4 is economically significant. For example, the coefficient -0.713 in the first row and column of the table 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. 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 4 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. (We do not include HML as a control in the regressions for *B/M* because the dependent variable is HML. Similarly, we do not include SMB as a control in the *ME* regression because the dependent variable is minus SMB.) 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 still prefer the univariate specifications. For many of our characteristics, returns might be correlated with temporary fluctuations in the expected returns associated with size or book-to-market, and thus the HML and SMB controls are potentially removing economically interesting variation. For example, our ability to forecast returns associated with price (*P*) is diminished once we control for contemporaneous realizations of SMB. Since size and price are tightly linked in both the cross-section and over time, this essentially tells us that the univariate forecasts for price reflect a similar pattern to the predictability we have documented for size (*ME*). Notwithstanding these stringent controls, the ability to forecast the returns of some characteristic-based portfolios remains. In the last column in Table 4, for example, characteristic spreads for β, distress (*SHUM*), and dividend policy (*Div*) prove to be somewhat useful for forecasting returns, despite the tight link between these characteristics and both size and *B/M* in both the cross-section and over time.

B. Issuance purged forecasting regressions

One concern with the results presented so far is that we might simply be restating 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 expected returns, 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 concern by forecasting the returns to "issuer-purged" characteristic portfolios computed using only the set of non-issuing firms. Specifically, while $ISSREP^{X}$ 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 5 shows these results. As expected, the results are weaker for several characteristics, suggesting that our initial findings in Table 4 may be 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 which can be used to forecast returns of non-issuers with similar characteristics.

C. Industry characteristics

We have not yet considered industry-based returns, yet industry is undoubtedly a salient firm characteristic. Industry membership is inherently categorical rather than continuous, and thus does not map neatly into our baseline methodology which requires us to assign high or low values of a characteristic to each stock (e.g., there is no sense in which a stock is a "low" or a "high" retailer).

We adapt our approach to study the expected returns associated with industry characteristics and estimate pooled monthly forecasting regressions of the form

$$R_{j,t} = a_t + b \cdot NS_{j,t-1} + c \cdot BM_{j,t-1} + d \cdot ME_{j,t-1} + e \cdot MOM_{j,t-1} + f \cdot \beta_{j,t-1} + u_{j,t}\,. \qquad (9)$$

In equation (11), $R_{j,t}$ is the value-weighted return to stocks in industry *j*. As in the previous section, industry returns are "issuer-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.[7] We also present specifications that add 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. We follow the common practice in academic studies of using the 48 industries identified by Fama and French (1997).[8] 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 (9) are shown in Table 6. 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 basis points 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 through 48). This yields even stronger evidence that industry net issuance is negatively related to future returns.

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[7] 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.

[8] 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 and French classifications may be too fine to capture the broad patterns of industry-level sentiment that might be expected under the characteristic mispricing view.

D. Robustness issues in time-series regressions

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.[9]

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. Our results are robust to controlling for lagged characteristic returns. Thus, the predictability we identify is distinct from the style-level reversal and momentum documented in Teo and Woo (2004). Our results are also robust to controlling for the "characteristic value spread" defined as the difference between the average book-to-market of high *X* and low *X* stocks. While value spreads help to forecast characteristic returns, these tests show that $ISSREP^X$

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

contains information over and above that contained in book-to-market ratios. Adding a time trend to the controls strengthens the results for several characteristics by eliminating a 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. Finally, since we previously noted a small cyclical component to some of the $ISSREP^X$ 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 variation in expected characteristic returns. For instance, Fama and French (2008c) suggest that opportunistic financing has increased markedly for small firms since 1982. Reassuringly, we obtain similar results if issuer-repurchaser spreads are based on the value-weighted averages of characteristic deciles among issuers and repurchasers as opposed to equal the equal-weighted averages. 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, $ISSREP^X$ has some forecasting power for long-short characteristic portfolios for both large and small stocks.

Fifth, 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). Both issuance and repurchase activity contribute to the predictability shown in Table 4.

A final set of concerns is related to "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.

E. *Panel Estimation*

Here we estimate panel specifications that follow directly from Section II. Specifically, we interact characteristics with estimates of time-varying characteristic expected returns to forecast firm-level returns in a panel regression. The panel technique should yield similar results to those shown in Tables 4 and 5, with the benefit that we can now directly 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 (this would be the case if managers used the book-to-market ratio as the summary measure of overvaluation which told them whether to issue or repurchase stock). Thus, the regressions that follow serve as a further robustness check.

Even ignoring the additional control variables, we might expect there to be some small differences with the results in Tables 4 and 5. For one, the panel estimation allows us to control 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:

$$NS_{i,t-1} = \theta_{t-1} + \delta_{t-1}^{X} \cdot X_{i,t-1} + \varepsilon_{i,t-1} \tag{10}$$

This procedure yields a series of 45 estimates (between 1962 and 2006) of δ^X. Conceptually, δ^X captures the same idea as the issuer-repurchaser spread ($ISSREP^X$) and the two measures are highly correlated over time. For example, the correlation between the issuer-repurchaser spread for size and the corresponding δ^{ME} time series is 0.79.[10]

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

$$R_{i,t} = a_t + b_1 \cdot X_{i,t-1} + b_2 \cdot (\delta_{t-1}^{X} \times X_{i,t-1}) + c \cdot NS_{i,t-1} + u_{i,t}. \tag{11}$$

The right-hand side includes lagged values of net issuance, lagged values of the characteristic, and 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. 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' issuance behavior contains information about future characteristic returns. Standard errors are clustered by year to account for the cross-sectional correlation of residuals.

Table 7 shows these results which largely confirm our earlier conclusions. Characteristic issuance tilts predict stock returns for the following attributes: book-to-market, size, price, and

[10] 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.

distress. Accruals, age, β, volatility, and dividend policy all attract t-statistics greater than 1.40.[11] In Panel B, we re-estimate the panel regression (11) 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.

V. Discussion

The correlations between the returns of characteristic-based portfolios and our issuer-repurchase spreads do not by themselves prove that characteristics are subject to time-varying mispricing. By extension, we cannot yet conclude that firms exploit time-varying characteristic demand in formulating their issuance and repurchase decisions. In this section, we consider and test two explanations for our results which are consistent with market efficiency. We then ask whether the evidence could be consistent with the view that issuance and repurchase activity is partly an attempt to time characteristic mispricing.

The simplest rational explanation for our results follows directly from the Modigliani and Miller (1958) theorem. It works as follows. Holding constant investors' required return on assets, when firms issue equity, the ratio of debt to total assets falls and investors' required return on equity falls mechanically. Eckbo, Masulis, and Norli (2000) argue that this deleveraging effect can explain why issuers generally underperform in the years after issuance. Baker and Wurgler (2000) argue that the effects on leverage are too small to explain the relationship between aggregate equity issuance and market returns. With respect to forecasting characteristic returns, we can rule out this explanation quite easily because our issuer-repurchaser spreads forecast the

[11] 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.

returns of firms that do not issue. Non-issuers share characteristics with issuing firms, but do not experience changes in leverage and thus should not experience any mechanical changes in required returns. In Table 5, for example, where we forecast purged characteristic returns, the coefficients on $ISSREP^X$ are virtually unchanged from the baseline regressions shown in Table 4, particularly for *B/M*, size, price, and distress. We can draw the same lesson from our panel regressions. In Table 7, we forecast characteristic-level returns controlling for each firm's individual issue and repurchase decisions.

A subtle variation of the Modigliani and Miller (1958) leverage effect is put forth by Carlson, Fisher, and Giammarino (2004). They argue that stock issuers experience lower returns post-issuance because firms extinguish growth options when they decide to invest. These growth options act as a form of operating leverage. Thus, when growth options are exercised, required returns to the equity holders should fall. In a follow-up article, Carlson, Fisher, and Giammarino (2006) argue that this theory can help explain the general underperformance of secondary equity offerings. We do not dispute the potential importance of this channel in explaining the returns to issuers; however, this channel cannot explain our results for the same reason as above. Specifically, because we can forecast the returns to characteristics-based portfolios for non-issuers, which do not experience changes in operating leverage.

A second potential explanation for our results is that issuance is simply a noisy proxy for investment which itself responds to changes in rationally required returns. Specifically, suppose that some risk factor has a time-varying price of risk, and that a given characteristic X is positively correlated with loadings on the risk factor. Consider what happens when the price of risk falls. Firms with high values of the characteristic (and hence high loadings on the risk factor) experience the largest declines in their required returns. These firms will raise their investment the most, financing some portion of this by issuing equity. Furthermore, if investment responds on the extensive margin as well (i.e., some firms that did not invest now choose to invest), then the factor loading and characteristic value for the marginal investing firm will rise. As a result, the average value of X among issuing firms may rise, potentially explaining the forecasting power of $ISSREP^X$.[12] How can we distinguish this explanation from one in which issuance and repurchase decisions are driven by firms' desire to exploit mispricing? The key is that in a fully rational story, measures of investment should drive out issuance as a forecaster of returns. Intuitively, issuance is simply a noisy proxy for investment because it also reflects largely uninformative decisions about how any investment should be financed. This prediction can be derived more formally in a model which allows for both time-series variation in rationally required returns as well as temporary mispricing. In the Appendix, we work out the details of such a model.

We can implement this idea empirically by constructing time-series which compare the characteristics of high investment firms with the characteristics of low investment firms.[13] We define the investment-non-investment spread for X as the difference between the average X-decile of firms in the top NYSE quintile of investment and the average X-decile of firms in the bottom NYSE quintile of investment:

$$INVNONINV_{t-1}^{X} = \frac{\sum_{i \in HighInvestment} X_{i,t-1}}{N_{t-1}^{HighInvestment}} - \frac{\sum_{i \in LowInvestment} X_{i,t-1}}{N_{t-1}^{LowInvestment}}. \quad (12)$$

[12] More formally, suppose there is a single risk factor and that required returns are given by $E_{t-1}[R_{i,t}]=R_f + \beta_i\lambda_{t-1}$ where β_i is firm i's factor loading and λ_{t-1} is the positive, time-varying price of risk for exposure to this factor. Suppose that all firms have access to projects that require an outlay of I at $t-1$ and yield $E[C]$ in expectation at t; these projects differ only in their risk as captured by β_i. Firm i invests at $t-1$ if $I \leq E[C]/E_{t-1}[R_{i,t}]$ or $\beta_i \leq \beta^*_{t-1} =(E[C]/I - R_f)/\lambda_{t-1}$. Note that the factor loading of both the marginal investing firm, β^*_{t-1}, and the average investing firm, $E[\beta_i \mid \beta_i \leq \beta^*_{t-1}]$ are decreasing in the price of risk, λ_{t-1}. Assuming that X_i is positively correlated with β_i, this implies that the average value of X among investing firms will also be decreasing in λ_{t-1}.

[13] Our investment spread is related to the investment factor in Lyandres, Sun, and Zhang (2008).

For example, $INVNONINV_{t-1}^{ME}=1$ indicates that high investment firms were on average one size decile larger than low investment firms in year *t-1*. To measure investment in equation (14), we use capital expenditures over assets (*CAPX/A*). We also construct *INVNONINV* using debt growth. Investment can be funded using either debt, equity, or internal funds, but mispricing-related explanations would have firms favor equity over debt when equity was perceived to be overvalued. Thus, debt growth can be interpreted as residual investment after netting out the portion that is funded by equity.[14]

Table 8 summarizes the $INVNONINV^X$ variables, as well as describing their correlations with the corresponding characteristic issuer-repurchaser spreads. As expected, the table shows that $INVNONINV^X$ is generally positively correlated with $ISSREP^X$, with an average correlation of 0.32 in Panel A and 0.21 in Panel B. There are some exceptions, however. For instance, the correlation between the investment based spread and $ISSREP^X$ actually turns negative in Panel A for the age and distress attributes.

In Table 9 we use the investment-noninvestment spread to forecast returns to characteristic portfolios:

$$R_t^X = a + c \cdot INVNONINV_{t-1}^X + u_t \tag{13}$$

Panel A shows these results when investment is measured using capital expenditures; in Panel B investment is the percentage growth in debt. As can be seen in the table, the results are mixed. For the full 1963-2007 sample period, only nominal share price is significant in both Panels A and B, while profitability (*E/B*) is also significant when investment is measured using debt growth. And, for six of the eleven characteristics, the sign goes the wrong direction when investment is measured using *CAPX/A*. The results are slightly stronger in the 1973-2007 period.

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[14] A related construction is to use asset growth as a measure of investment. This combines equity and debt funded investment. These results are shown in the Internet Appendix.

For instance, the coefficient for size is now significant in Panel A and is marginally significant in Panel B. Overall, these investment-based measures have some modest ability to forecast characteristic-level returns.

In Table 10, we run a horse-race between $INVNONINV^X$ and our $ISSREP^X$ variable to forecast future characteristic returns:

$$R_t^X = a + b \cdot ISSREP_{t-1}^X + c \cdot INVNONINV_{t-1}^X + u_t \tag{14}$$

Recall that under the null hypothesis where all time-variation in expected returns is due to variation in rationally required returns, $ISSREP^X$ is simply a noisy proxy for $INVNONINV^X$. We consider first the results in Panel A, where investment is measured as capital expenditures. For nearly every characteristic, the coefficient *b* on $ISSREP^X$ is nearly identical to its value in the univariate regressions shown in Table 4. For example, for the 1963-2007 sample period, *b*=-0.713 for book-to-market and -0.214 for size in Table 4, and -0.734 and -0.229 in Table 10. Interestingly, the coefficient *c* on $INVNONINV^X$ is no longer significant for a single characteristic, and the vast majority of the time goes in the wrong direction. This same general pattern emerges in Panel B where investment is measured as the percentage change in debt. While *c* is statistically significant for sales growth in the 1963-2007 period and for share price and profitability in the 1973-2007 period, the coefficients on $ISSREP^X$ are again largely unaffected in Panel B. In summary, explanations based on time-varying risk premia – at least insofar as they should drive firm-level investment – do not fare well in our forecasting regressions.

One potential objection is that these rational explanations link required returns to investment *plans*, but there may be a short gap between investment plans and realized investment (e.g., Lamont (2000)). In this case, one could argue that issuance is perhaps a better proxy for investment plans than investment itself. While we cannot rule out this explanation entirely, we can look ahead to firms' future investment rates. Specifically, we can construct $INVNOINV^X$ based on *future* capital expenditures, and run the same horse race as shown in Table 10. These results are similar (see Internet Appendix) in that the coefficients on $ISSREP^X$ are virtually unchanged compared to the univariate specifications in Table 4. Another robustness test is construct $INVNOINV^X$ based on asset growth (conceptually we prefer measures based on capital expenditures or debt growth because asset growth combines growth in both financial and real assets, and thus is mechanically linked to equity issues). In the Internet Appendix, we show results for this alternate construction as well, reaching similar conclusions.

Taken together, it is difficult to fully explain our results within a straightforward rational framework. At the same time, our results do not show that all time variation in expected characteristic returns is due to mispricing. However, they do lend support to the view that public companies have successfully timed characteristic returns in their issuance and repurchase decisions.

VI. Evaluating the importance of characteristic timing for corporate issuance

The previous section suggests that issuance and repurchase activity is partly an attempt to exploit time-varying characteristic mispricing. But what fraction of the underperformance of net issuers does such characteristic timing explain? We can address this question by modifying 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, so the results should be seen as a lower bound estimate of the importance of characteristic timing. 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 book-to-market 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 (1997), *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.[15]

[15] Our measure captures the ability of issuers to time characteristics at both short and long horizons whereas the measure used in the mutual fund literature is primarily designed to capture timing ability at shorter horizons.

We report the results of this decomposition in Table 11. 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 based on *NS*. 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.

VII. Conclusion

Firms are well suited to time broad patterns of characteristic-based mispricing. When investors demand a particular characteristic, firms absorb some of that demand by issuing new equity. When a particular characteristic is out of favor, firms endowed with that characteristic repurchase shares. Consistent with this idea, 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.

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. 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.

Although characteristic timing based on size and book-to-market only explains a modest portion of the total underperformance of issuers, it is interesting to contrast this with studies of mutual fund performance (i.e. Grinblatt, Titman, and Wermers (1997) and Wermers (2000)). These studies typically find that mutual funds have very small or even slightly negative characteristic timing ability. The contrast between these studies and our findings for issuing firms is consistent with the view that corporations may have a comparative advantage over professional investors in attacking certain forms of broad-based mispricing. This advantage may be greatest when mispricing converges slowly or is associated with undiversifiable risk. It is plausible that these conditions could be satisfied for the most salient characteristics we consider, including size, book-to-market, and industry.

Appendix A: Corporate investment and issuance in a model with time-varying rational discount rates and mispricing

Our model draws on Stein (1996). Managers maximize the net present value of investment *f(I)* of which *E* is funded with equity and the remaining (*I*-*E*) with debt. The firm's target leverage ratio is $D \in (0,1)$. All projects must be financed externally, and all external capital must be devoted to investment. The manager solves:

$$\max_{I,E} \left\{ f(I)/R_F - I + E\left(1 - R_\Delta / R_F\right) - Z(E-(1-D)I) \right\} \tag{A1}$$

where R_F is the (possibly time-varying) rationally required return for the project and $R_\Delta = \Delta\, R_F$ is the conditional expected return that takes into account the expected mean reversion of any temporary mispricing. We assume that $f' > 0$, $f'' < 0$, and that $Z(\cdot)$ is a convex U-shaped function with $Z(0) = 0$. When $\Delta < 1$ the firm's stock is temporarily overvalued and when $\Delta > 1$ the firm's stock is temporarily undervalued. The first two terms capture the manager's desire to maximize the long-term fundamentals-based net present value of investment; the second term captures the manager's desire to issue stock to exploit any temporary mispricing and reflects the value transfer to long-term shareholders from short-term shareholders who buy mispriced equity; the third term represents the costs of deviating from target leverage ratio *D*. The third term implies that firms do not respond with infinite elasticity at the slightest bit of mispricing and that investment as well as equity issuance may respond to mispricing. The first order conditions are:

$$f'(I^*)/R_F - 1 + (1-D)Z'(E^* - (1-D)I^*) = 0, \tag{A2}$$

and

$$1 - \Delta = Z'(E^* - (1-D)I^*). \tag{A3}$$

We explore these results under a simple parameterization, where $f(I)=\log(I)$ and $Z(L)= ½\theta L^2$. In this case, equations (A2) and (A3) simplify to the following expressions for optimal investment *I* and equity issuance *E*:

$$I^* = \left[DR_F + (1-D)R_\Delta\right]^{-1} = R_F^{-1}\left[1-(1-D)(1-\Delta)\right]^{-1}, \tag{A4}$$

and

$$E^* = (1-D)I^* + (1-\Delta)/\theta. \tag{A5}$$

Equation (A4) states that the hurdle rate for investment is a weighted average of the rationally required return (which may vary over time) and the conditional expected return which reflects the expected mean reversion of any temporary mispricing. Intuitively, because it is costly for firms to deviate from their target capital structure and because firms cannot issue equity and hold the proceeds in cash indefinitely, investment may also respond to temporary mispricing if managers are trying to time the market. Equation (A5) states that equity issuance reflects optimal investment and the firm's target capital structure, plus the deviation from target leverage due to market timing (the manager want to issue more stock when $\Delta < 1$).

The discussion above suggests that issuance and investment may each be useful for forecasting future returns because they contain different information about rationally required returns (R_F) and the expected reversion of any mispricing (Δ). A multivariate regression that includes both equity issuance and investment as a control can help to isolate the effect of time-varying mispricing. To see this formally, we use lower case letters to denote logs (i.e, let $x=\log(X)$) and log-linearize (A4) and (A5) around the long-run mean in which there is no mispricing (Δ=1) and rationally required returns are R. This yields the following expressions for log investment and equity issuance at time *t*:

$$i_t^* - \bar{i}^* = -(r_{F,t} - \bar{r}) - (1-D)\delta_t, \qquad \text{(A6)}$$

and

$$e_t^* - \bar{e}^* = -(r_{F,t} - \bar{r}) - (1-D)\delta_t - \frac{R}{(1-D)\theta}\delta_t = (i_t^* - \bar{i}^*) - \frac{R}{(1-D)\theta}\delta_t. \qquad \text{(A7)}$$

Consider the following thought experiment, in which we compare the effect of changes in the rational discount rate ($r_{F,t}$) on i_t^* and e_t^*, with the effect of changes in expected returns due to mispricing (δ_t). Reductions in $r_{F,t}$ increase both investment and equity issuance one-for-one. Reductions in δ_t increase investment, but less so than reductions in $r_{F,t}$. This is because managers trade off the benefits of market timing against the costs of overinvestment. The above expressions also show that e_t^* will respond more elastically than i_t^* to changes in δ_t. Moreover, assuming that $\theta < R/(D(1-D))$ so that the costs of deviating from target leverage are not too high, issuance will respond more to a given change in δ_t than a comparable change in $r_{F,t}$.

Now suppose that the realized log return at time *t+1* is given by $r_{t+1} = r_{F,t} + \delta_t + \varepsilon_{t+1}$ and assume that the three terms are uncorrelated. We first consider the case in which there is time series variation in both $r_{F,t}$ and δ_t. Now, the coefficient on e_t^* in a univariate return forecasting regression is given by:

$$b_u = \frac{Cov[e_t^*, r_{t+1}]}{Var[e_t^*]} = -\frac{Var[r_{F,t}] + [(1-D) + (R/((1-D)\theta))] \cdot Var[\delta_t]}{Var[r_{F,t}] + [(1-D) + (R/((1-D)\theta))]^2 \cdot Var[\delta_t]}. \qquad \text{(A8)}$$

Similarly, the coefficient on i_t^* in a univariate return forecasting regression is given by:

$$c_u = \frac{Cov[i_t^*, r_{t+1}]}{Var[i_t^*]} = -\frac{Var[r_{F,t}] + (1-D) \cdot Var[\delta_t]}{Var[r_{F,t}] + (1-D)^2 \cdot Var[\delta_t]}. \qquad \text{(A9)}$$

By contrast in a multivariate regression, we have:

$$\begin{bmatrix} b_m \\ c_m \end{bmatrix} = \begin{bmatrix} Var[e_t^*] & Cov[e_t^*, i_t^*] \\ Cov[e_t^*, i_t^*] & Var[i_t^*] \end{bmatrix}^{-1} \begin{bmatrix} Cov[e_t^*, r_{t+1}] \\ Cov[i_t^*, r_{t+1}] \end{bmatrix} = \begin{bmatrix} -(1-D)(D\theta)/R \\ -1 + (1-D)(D\theta)/R \end{bmatrix}. \qquad \text{(A10)}$$

Again, assuming that $\theta < \bar{R}/(D(1-D))$, it follows that $-1 < b_u < b_m < 0$ and $c_u < -1 < c_m < 0$. That is, the coefficients on equity issuance and investment from a multivariate regression that includes both variables will be smaller in magnitude than the corresponding univariate coefficients due to a classic omitted variable bias.

However, in a fully rational model with $Var[\delta_t] = 0$ or in the absence of managerial attempts to time mispricing, one would expect investment to drive out issuance in a multivariate specification as long as there is some amount of noise in financing decisions. (In the absence of any noise, investment and issuance would be perfectly collinear in this case.) One way to model this noise is to assume that target leverage ratios fluctuate in ways that are uncorrelated with expected returns. Under this assumption, (A6) remains unchanged and (A7) becomes:

$$e_t^* - \bar{e}^* = (i_t^* - \bar{i}^*) - \frac{R}{(1-D)\theta}\delta_t - \frac{D}{(1-D)}(d_t - \bar{d}), \qquad \text{(A11)}$$

where $d_t - \bar{d}$ represents the deviation of target leverage from its long-run mean. The intuition is that changes in target leverage have a first order effect on equity issuance, but only affect investment when $\Delta \neq 1$. In this case, the coefficient on investment from a univariate forecasting regression (c_u) remains unchanged, the coefficient on issuance (b_u) in a univariate regression is:

$$b_u = -\frac{Var[r_{F,t}] + [(1-D) + (R/((1-D)\theta))] \cdot Var[\delta_t]}{Var[r_{F,t}] + [(1-D) + (R/((1-D)\theta))]^2 \cdot Var[\delta_t] + (D/(1-D))^2 \cdot Var[d_t]}, \quad \text{(A12)}$$

and a multivariate regression yields:

$$\begin{bmatrix} b_m \\ c_m \end{bmatrix} = -\begin{bmatrix} \dfrac{Var[r_{F,t}]Var[\delta_t] \cdot R\theta D(1-D)}{R^2 Var[r_{F,t}]Var[\delta_t] + Var[d_t]\theta^2 D^2 \cdot [Var[r_{F,t}] + (1-D)^2 Var[\delta_t]]} \\ \dfrac{Var[r_{F,t}]Var[\delta_t] \cdot [R^2 - R\theta D(1-D)] + Var[d_t]\theta^2 D^2 \cdot [Var[r_{F,t}] + (1-D)Var[\delta_t]]}{R^2 Var[r_{F,t}]Var[\delta_t] + Var[d_t]\theta^2 D^2 \cdot [Var[r_{F,tt}] + (1-D)^2 Var[\delta_t]]} \end{bmatrix}. \quad \text{(A13)}$$

(A13) reduces to (A10) when $Var[d_t] = 0$. It is straightforward to see from (A13) that so long as $Var[d_t] > 0$ investment will completely drive out issuance in a horse race when $Var[r_{F,t}] = 0$ or $Var[\delta_t] = 0$. The same result obtains if managers do not issue equity to exploit mispricing. The intuition is that in each case, equity issuance contains no additional information about expected returns over and above investment. Thus, it is driven out in a horse race because it also reflects a series of uninformative decisions about how investment should be financed.

Appendix B: Characteristic Definitions

Where applicable, we provide in parentheses 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.

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

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

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.

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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.

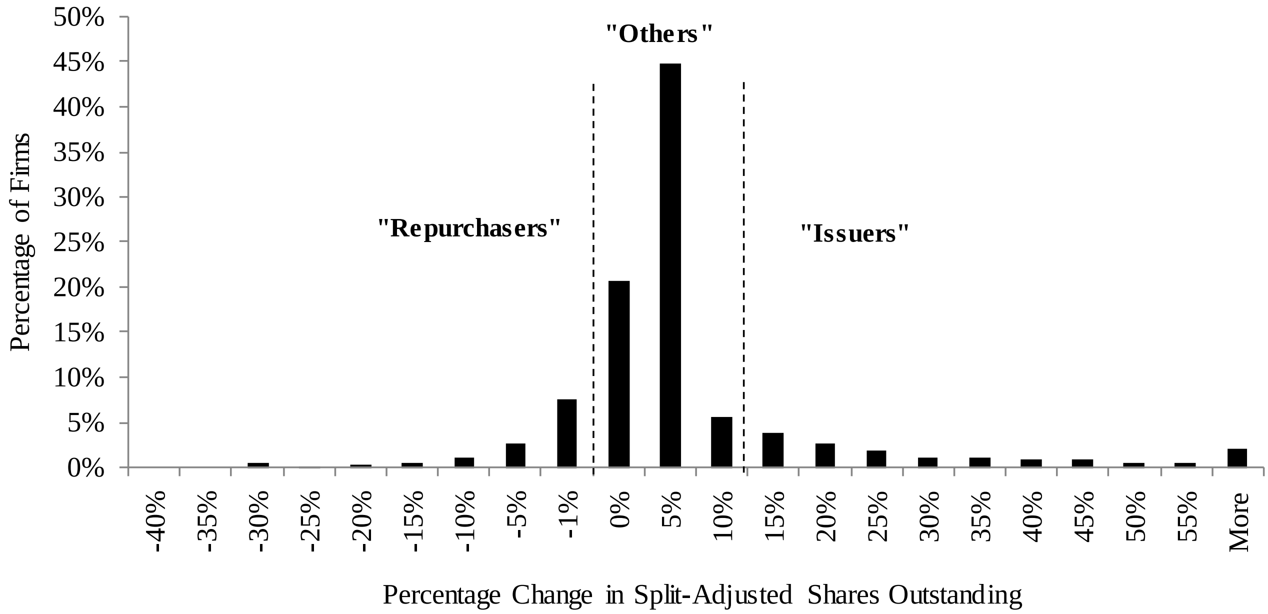
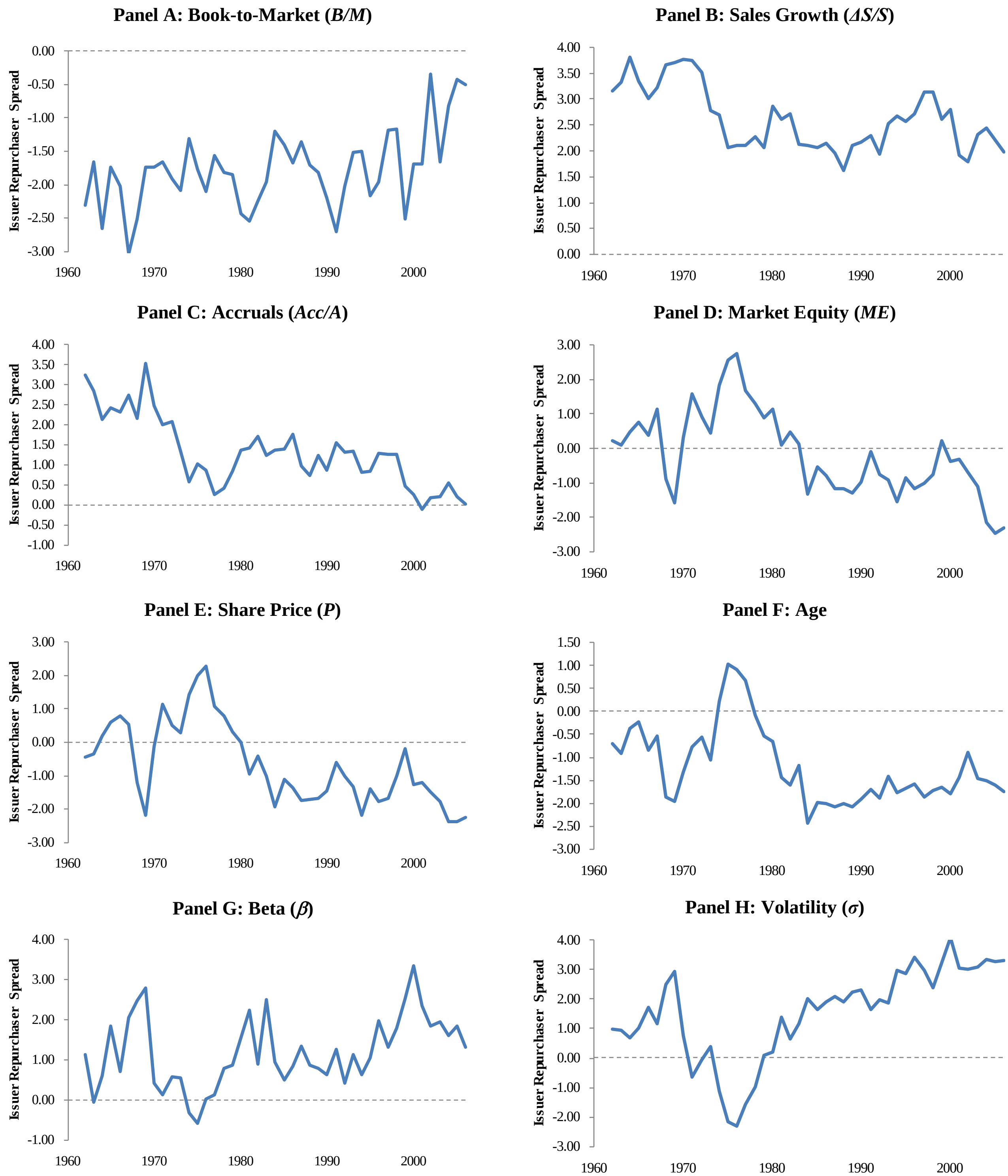


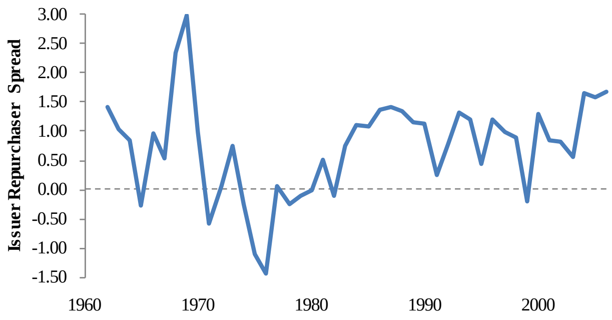
Figure 2. Issuer-repurchaser spreads 1962-2006. We plot the difference between the average characteristics of stock issuers and stock repurchasers. Characteristics include the book-to-market ratio (*B/M*), sales growth (*ΔS/S*), accruals (*Acc/A*), market equity (*ME*), nominal share price (*P*), Age, 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.



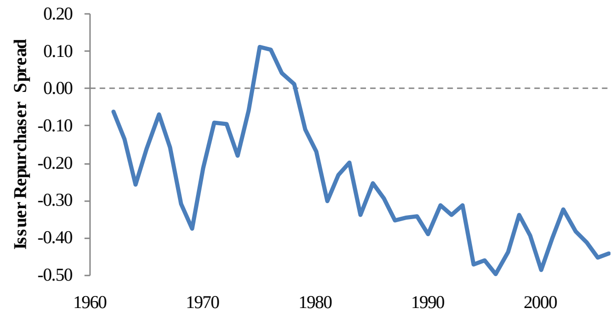
[…continued overleaf]

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

Panel I: Distress (*SHUM*)



Panel J: Dividend policy (*Div*)



Panel K: Profitability (*E/B*)

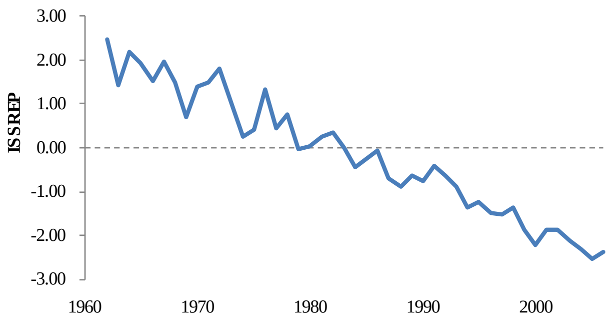


Table 1. Summary Statistics. Mean, median, standard deviation and extreme values of issuance, firm characteristics, and returns. To be included in the sample, the firm must (1) report positive book equity in the fiscal year ending in calendar year *t-1* and (2) have CRSP market equity in June of year *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 along the themes of growth, size and risk, 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 issuer repurchaser spreads. The issuer repurchaser spread for characteristic *X* is the difference between the mean NYSE decile of *X* between stock issuers and repurchasers in that year. Panel D 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.

	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)					
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
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 (*E/B*) %	172,477	0.65	10.27	47.97	-647.90	298.53
	Panel C: Issuer-repurchaser spreads (Annual 1962-2006)					
B/M (High - Low)	45	-1.78	-1.75	0.58	-3.05	-0.35
$\Delta S/S_{t-1}$ (High - Low)	45	2.62	2.57	0.61	1.62	3.82
Acc/A (High - Low)	45	1.30	1.27	0.87	-0.12	3.53
ME (High - Low)	45	-0.16	-0.32	1.23	-2.48	2.76
P (High - Low)	45	-0.67	-1.03	1.22	-2.40	2.28
Age (High - Low)	45	-1.21	-1.47	0.83	-2.45	1.03
β (High - Low)	45	1.18	1.05	0.88	-0.60	3.34
σ (High - Low)	45	1.50	1.83	1.57	-2.33	4.07
SHUM (High - Low)	45	0.73	0.83	0.84	-1.45	2.98
Div (Payer - Nonpayer)	45	-0.26	-0.31	0.16	-0.50	0.11
E/B (High - Low)	45	-0.15	-0.06	1.40	-2.53	2.47
	Panel D: Characteristic-based portfolio returns (Monthly % July 1963-June 2008)					
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
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
β (High – Low)	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
E/B (High - Low)	540	0.10	0.07	2.26	-15.70	11.02

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	Counts by firm type					Mean Change in Shares Outstanding (%)		
Year	**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. 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 ($\Delta S/S$), 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 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								
Size and Risk:											
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								
Size and Risk:											
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 4. 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 measured 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, size and risk, 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*. *t*-statistics are 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]
Size and Risk:								
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 5. 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 (*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 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, size and risk, 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*. *t*-statistics 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]
Size and Risk:								
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 6. 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]
Month 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]
Month 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 7. 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*:

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

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

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	$\mathbf{b_2}$	**[t]**	$\mathbf{b_2}$	**[t]**	$\mathbf{b_2}$	**[t]**	$\mathbf{b_2}$	**[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]
Size and Risk:								
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 8. Investment-based characteristic spreads. Summary statistics for investment-based characteristic spreads. ρ denotes the correlation with the corresponding issuer-repurchaser spread. In Panel A, investment is measured as capital expenditures scaled by assets; in Panel B, investment is the percentage change in total debt. The investment-noninvestment spread for characteristic *X* is the difference between the average NYSE decile of *X* between top quintile investment firms and bottom quintile investment firms. 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*).

	Summary Statistics:						Correlation with ISSREP^{X}:
	N	**Mean**	**Median**	**SD**	**Min**	**Max**	**ρ**
Panel A: Investment-based characteristic spreads (Investment = Capx/Assets)							
Book-to-Market (*B/M*)	45	-1.33	-1.17	0.55	-2.41	-0.43	0.11
Sales growth ($\Delta S/S_{t-1\,\%}$) %	45	1.36	1.37	0.58	-0.15	2.57	0.28
Accruals (*Acc/A*) %	45	-1.41	-1.41	0.50	-2.40	-0.18	0.11
Size (*Log(ME)*)	45	1.18	1.09	0.50	0.39	2.13	0.65
Price (*P*)	45	1.00	0.95	0.51	0.12	1.92	0.72
Age	45	-0.25	-0.26	0.48	-1.21	0.77	-0.11
Beta (*β*)	45	0.17	0.15	0.58	-1.18	1.93	0.26
Volatility (*σ*) %	45	-0.33	-0.45	0.71	-1.32	2.14	0.50
Distress (*SHUM*) %	45	-0.88	-0.83	0.50	-2.18	0.55	-0.07
Dividend Policy (*Div*)	45	0.04	0.05	0.08	-0.20	0.15	0.40
Profitability (*E/B*) %	45	1.23	1.19	0.48	0.33	2.00	0.68
Panel B: Investment-based characteristic spreads (Investment = ΔDebt/Debt)							
Book-to-Market (*B/M*)	45	-0.51	-0.53	0.46	-1.19	0.36	0.29
Sales growth ($\Delta S/S_{t-1\,\%}$) %	45	1.70	1.70	0.35	0.94	2.45	0.44
Accruals (*Acc/A*) %	45	2.43	2.44	0.90	0.85	4.16	0.57
Size (*Log(ME)*)	45	0.35	0.33	0.29	-0.18	1.36	0.33
Price (*P*)	45	0.36	0.35	0.30	-0.16	1.09	0.32
Age	45	-0.36	-0.37	0.23	-0.90	0.19	-0.18
Beta (*β*)	45	-0.01	0.09	0.41	-0.94	1.02	0.08
Volatility (*σ*) %	45	-0.31	-0.24	0.39	-1.36	0.41	-0.21
Distress (*SHUM*) %	45	0.65	0.63	0.30	0.00	1.20	0.14
Dividend Policy (*Div*)	45	0.05	0.05	0.05	-0.06	0.18	0.03
Profitability (*E/B*) %	45	0.33	0.36	0.44	-0.64	1.10	0.55

Table 9. Forecasting characteristic returns using investment-non-investment spreads. Univariate time-series regressions of monthly long-short portfolio returns on lagged values of the investment-non-investment spread for the corresponding characteristic:

$$R_t^X = a + c \cdot INVNONINV_{t-1}^X + u_t$$

The investment-non-investment spread is the difference between the average characteristic decile of high- and low- investment firms. In Panel A, investment is capital expenditures over assets. In Panel B, investment is the percentage change in debt. High investment firms are defined as those in the top NYSE quintile and low investment firms are those in the bottom NYSE quintile. 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 measured 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, size and risk, 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 $INVNONINV_{t-1}$ is only refreshed annually, standard errors are clustered by 12-month blocks running from July *t* to June *t+1*. *t*-statistics are in brackets.

	Panel A: Investment = Capx/Assets				Panel B: Investment = ΔDebt/Debt			
	1963-2007		1973-2007		1963-2007		1973-2007	
	c	**[t]**	**c**	**[t]**	**c**	**[t]**	**c**	**[t]**
Growth:								
B/M	0.116	[0.32]	0.053	[0.13]	0.160	[0.35]	0.092	[0.17]
$\Delta S/S_{t-1}$	0.067	[0.42]	0.056	[0.32]	-0.297	[-1.55]	-0.502	[-1.43]
Acc/A	-0.156	[-1.10]	-0.140	[-1.02]	-0.045	[-0.62]	-0.042	[-0.66]
Size and Risk:								
ME	-0.311	[-0.89]	-0.708	[-2.01]	0.014	[0.03]	-0.983	[-1.54]
P	-0.520	[-2.32]	-0.769	[-3.27]	-0.786	[-1.96]	-1.458	[-3.01]
Age	-0.246	[-0.95]	-0.292	[-1.02]	-0.608	[-1.01]	-0.629	[-0.90]
β	0.407	[1.29]	0.227	[0.72]	0.307	[0.76]	0.243	[0.53]
σ	0.266	[1.23]	0.056	[0.35]	0.418	[0.73]	-0.084	[-0.13]
SHUM	0.379	[1.26]	0.379	[1.17]	0.320	[0.61]	0.746	[1.04]
Div	0.072	[0.04]	-1.501	[-0.90]	-2.510	[-0.55]	-6.772	[-1.62]
Profitability:								
E/B	-0.322	[-1.16]	-0.448	[-1.47]	-0.491	[-1.90]	-0.854	[-2.63]

Table 10. Forecasting characteristic returns using issuer repurchaser spreads and investment-non-investment spreads. Bivariate time-series regressions of monthly long-short portfolio returns on lagged values of the issuer-repurchaser spread and lagged values of the investment-non-investment spread for the corresponding characteristic:

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

The issuer repurchaser spread is the difference between the average characteristic decile of issuers and repurchasers. The investment-non-investment spread is the difference between the average characteristic decile of high- and low- investment firms. High investment firms are defined as those in the top NYSE quintile and low investment firms are those in the bottom NYSE quintile. In Panel A, investment is capital expenditures over assets. In Panel B, investment is the percentage change in debt. 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 measured 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, size and risk, 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 $ISSREP_{t-1}$ and $INVNONINV_{t-1}$ are only refreshed annually, standard errors are clustered by 12-month blocks running from July *t* to June *t+1*. *t*-statistics are in brackets.

	Panel A: Investment = Capx/Assets								Panel B: Investment = ΔDebt/Debt							
	1963-2007				1973-2007				1963-2007				1973-2007			
Growth:	**b**	**[t]**	**c**	**[t]**	**b**	**[t]**	**c**	**[t]**	**b**	**[t]**	**c**	**[t]**	**b**	**[t]**	**c**	**[t]**
B/M	-0.734	[-2.72]	0.203	[0.60]	-0.837	[-2.32]	0.162	[0.43]	-0.824	[-2.63]	0.465	[1.05]	-0.875	[-2.26]	0.331	[0.64]
ΔS/S $_{t-1}$	0.061	[0.42]	0.049	[0.27]	-0.204	[-0.78]	0.066	[0.36]	0.183	[1.25]	-0.438	[-1.89]	-0.126	[-0.48]	-0.455	[-1.27]
Acc/A	-0.011	[-0.12]	-0.153	[-1.07]	-0.032	[-0.22]	-0.122	[-0.83]	0.006	[0.06]	-0.049	[-0.62]	-0.078	[-0.51]	-0.026	[-0.35]
Size and Risk:																
ME	-0.229	[-1.42]	0.058	[0.14]	-0.332	[-3.19]	0.063	[0.16]	-0.240	[-1.94]	0.357	[-0.73]	-0.297	[-3.39]	-0.295	[-0.49]
P	-0.213	[-1.40]	-0.154	[-0.39]	-0.254	[-1.47]	-0.272	[-0.57]	-0.221	[-2.46]	-0.497	[-1.15]	-0.279	[-2.97]	-1.157	[-2.39]
Age	-0.152	[-1.07]	-0.275	[-1.07]	-0.136	[-0.93]	-0.322	[-1.13]	-0.167	[-1.09]	-0.720	[-1.10]	-0.150	[-0.92]	-0.758	[-0.98]
β	-0.366	[-1.36]	0.553	[1.65]	-0.465	[-1.48]	0.375	[1.12]	-0.281	[-1.02]	0.352	[0.84]	-0.391	[-1.19]	0.099	[0.20]
σ	-0.185	[-1.07]	0.471	[1.74]	-0.189	[-1.12]	0.276	[1.12]	-0.059	[-0.38]	0.369	[0.63]	-0.145	[-1.10]	-0.267	[-0.41]
SHUM	-0.367	[-1.68]	0.334	[1.17]	-0.597	[-3.00]	0.259	[0.90]	-0.407	[-1.77]	0.480	[0.95]	-0.627	[-3.20]	0.756	[1.18]
Div	-1.685	[-1.33]	1.498	[0.79]	-2.393	[-2.06]	0.328	[0.18]	-1.383	[-1.14]	-2.382	[-0.52]	-2.217	[-2.32]	-6.268	[-1.56]
Profitability:																
E/B	-0.109	[-1.27]	-0.105	[-0.33]	-0.170	[-1.10]	-0.177	[-0.46]	-0.070	[-0.89]	-0.368	[-1.39]	-0.112	[-0.97]	-0.699	[-2.06]

Table 11. 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]	