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Corporate financing decisions, managerial market timing, and real investment ☆

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ABSTRACT

Both market timing and investment-based theories of corporate financing predict under-performance after firms raise capital, but only market timing predicts that the composition of financing (equity compared with debt) should also forecast returns. In cross-sectional tests, we find that the amount of net financing is more important than its composition in explaining future stock returns. In the time series, investment-based factor models explain abnormal stock performance following a variety of corporate financing events that previous studies link to market timing. At the aggregate level, the amount of new financing is also more important for future market returns than its composition. Overall, our joint tests reveal that measures of real investment are correlated with future returns and measures of managerial market timing are not.

1. Introduction

Two prominent theories of corporate financing decisions—market timing and real investment—predict lower stock returns following security issuance. This shared prediction finds strong support in the data, but the two theories offer very different explanations. The market timing story argues that corporate managers successfully issue securities to exploit mispricing. As a result, abnormal negative returns tend to follow equity issues because corporate managers issue equity when it is overpriced. Alternatively, real investment-based theories argue that market prices respond efficiently to changes in risk when firms raise external capital. In this case, low returns follow security issuance as managers convert growth options into real assets or respond to changes in the cost of capital.

In this paper we exploit a subtle difference between the two theories to disentangle the effects of managerial market timing from the effects of investment. Although both explanations predict lower equity returns following an increase in the level of net financing (the level effect), market timing predicts that the composition of net financing matters more (the composition effect). The reason for this prediction is that managers issue more equity relative to debt when they believe that the equity is overvalued and repurchase more equity relative to debt when they believe that the firm is undervalued. Therefore, conditional on the level of net financing, market timing predicts

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lower returns for equity issuers than for debt issuers and higher returns for equity repurchasers than for debt repurchasers. Both level and composition effects could be present in the data. Our tests identify their incremental explanatory power.

Our main finding is that the level of net financing is an important predictor of future equity returns but the composition is not. In cross-sectional regressions, we find that firms raising capital tend to have lower future returns than firms distributing capital. However, conditional on the net amount of capital raised, we find that equity issuers tend to have future returns similar to debt issuers, and equity repurchasers tend to have future returns similar to debt repurchasers. In time series regressions, we find that an investment-based factor model (Chen, Novy-Marx, and Zhang, 2010) explains abnormal stock performance after corporate financing events, independently of the type of security involved in the event. When we test the level and composition effects jointly, it appears that variation in future stock returns are related to the level, but not the composition.

Substantial evidence shows that both the composition and level of net financing can affect capital flows when considered separately. For example, some studies find that firms appear to under-perform after raising equity capital (e.g., Ritter, 1991; Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Baker and Wurgler, 2000) and after issuing debt (e.g., Lee and Loughran, 1998; Spiess and Affleck-Graves, 1999; Daniel and Titman, 2006; Billett, Flannery, and Garfinkel, 2006). Furthermore, Richardson and Sloan (2003) find a negative relation between external financing and future returns, Pontiff and Woodgate (2006) find negative returns after increases in the number of shares outstanding, and Cooper, Gulen, and Schill (2008) find abnormal negative performance after growth in total assets. Collectively, these studies show that firms under-perform when they raise external capital. At the same time, firms appear to outperform after distributing cash to equity holders and bond holders (e.g., Ikenberry, Lakonishok, and Vermaelen, 1995; Michaely, Thaler, and Womack, 1995; Affleck-Graves and Miller, 2003; Peyer and Vermaelen, 2005). The recurring theme in these studies is that managers could be able to reduce their cost of capital by strategically timing their security issuance or repurchase decisions.

But efficient markets explanations also exist for the stock return performance after issuing or repurchasing activities. Firms could experience lower returns after raising capital simply through the q-theory of investment (e.g., Cochrane, 1991, 1996; Zhang, 2005; Li, Livdan, and Zhang, 2009; Liu, Whited, and Zhang, 2009). According to q-theory, a reduction in a firm's cost of capital increases the marginal value of investment. Firms respond to a reduction in required returns by increasing investment, producing a negative relation between investment and future returns, regardless of whether investment is financed by debt or equity.

Another explanation for the relation between a firm's external financing decisions and subsequent returns is that a firm's cost of capital responds to investment as the firm converts growth options into real assets. For example, Berk, Green, and Naik (1999) and Carlson, Fisher, and Giammarino (2004) argue that when a firm invests, exercising its growth options, the firm's required rate of return should decrease because an underlying asset is less risky than an option on that asset.[1] Consistent with this story, Lyandres, Sun, and Zhang (2008) find less under-performance after conditioning on aggregate investment factors. Xing (2008) similarly finds that the value effect is related to differences in real investment, and Bakke and Whited (2010) find that investment does not systematically respond to certain measures of mispricing. Chen, Novy-Marx, and Zhang (2010) are able to explain several asset pricing anomalies using a factor model rooted in the q-theory of investment. The q-theory and real options stories both provide a rational link between capital flows and returns.

Our empirical strategy is to test the real investment and market timing hypotheses simultaneously. To measure the real investment effect we construct a proxy using the level of net financing (*NF*) because timing-based decisions can come from the choice between debt and equity and whether the firm is issuing or repurchasing financial securities. For example, some firms cut their dividends, raise equity, retire debt, and repurchase shares all within the same fiscal year. Without a measure of net capital flow, it is not clear whether the firm is returning cash to the capital markets or raising additional funds. Our focus on net financing decisions captures the full spectrum of possible capital market flows and is consistent with the spirit of a Modigliani-Miller capital raising (or distributing) firm. Our proxy for the market timing-based composition effect is similar in spirit to the equity share of new issues measure employed by Baker and Wurgler (2000). We construct a firm-level *Equity Ratio* (*ER*) as the proportion of net equity to net capital raised.

Our tests confirm that, when considered separately, both the level and the composition of net financing have predictive power over future returns. Specifically, firms tend to issue more equity when future stock returns are low and repurchase equity when future stock returns are high. However, when we include the level and composition in the same regression, the real investment effect crowds out the market timing effect. This result holds across various subsamples as well. No matter how we split our sample—by size, book to market, momentum, and investor sentiment—we find that net financing explains future returns but the composition of net financing does not.

As a robustness check, we perform a matched sample analysis. We match net equity issuers to net debt issuers

[1] If the risk of the assets does not change after the exercise of the real option, then the composition of financing could matter. For example, if the option exercise is financed by equity, then less risky equity is swapped for the option and required returns decline. However, if the investment is financed with debt, then the reduction in risk from option conversion is offset by the increase in risk from additional financial leverage. If the investment results in lower asset risk, then required returns decline unambiguously. Whether the net effect is positive or negative is an empirical question.

with the same level of total net financing. By fixing the level of net financing through our matching procedure, differences in stock market performance are due to the type of financing, not the level. Consistent with our regression evidence, we find that net equity issuers have the same abnormal returns as net debt issuers.

Our findings are also related to recent work by Schultz (2003), who argues that the appearance of market timing could simply be an artifact of the positive correlation between investment and market prices over the business cycle. If one observes more equity issues after a run-up in stocks prices, then one could, ex post, observe negative returns after the volume of equity issues peaks. However, this story, like the investment-based theories, also predicts abnormal performance after any type of corporate financing event that is triggered by market returns. In contrast, market timing posits that there is greater under-performance following equity issues. Using the capital asset pricing model (CAPM) or the Fama and French (1993) three-factor model (FF3), we confirm abnormal long-run returns following equity issues, equity repurchases, debt issues, private equity issues, open-market share repurchases, and bank loans. However, the investment-based factor model of Chen, Novy-Marx, and Zhang (2010) appears to explain these abnormal returns.

Finally, we test whether the aggregate level of financing crowds out the aggregate composition of financing in explaining future aggregate market returns. We find that measures of changes in aggregate net financing provide greater explanatory power for future market returns than the equity share variable (S) proposed by Baker and Wurgler (2000). The aggregate-level results are consistent with our firm-level results: the level of new financing is more important for explaining future returns than the composition of that new financing.

The paper proceeds as follows. Section 2 presents a description of our sample, methods, and variable construction. Section 3 presents our baseline tests and subsample analysis. Section 4 examines the matched sample results. Section 5 presents tests of the explanatory power of our net financing measure for future returns following a variety of corporate financing events. Section 6 presents aggregate level tests. Section 7 concludes the paper.

2. Sample selection, variable definitions, and descriptive statistics

In this section we explain how we create our sample and main variables. Further, we provide summary statistics, and examine the basic relation between net financing and real investment.

2.1. Sample selection

Our initial sample consists of all the firms that are present on both the Center for Research in Security Prices (CRSP) and Compustat, are not utilities or financials [standard industrial classification (SIC) codes 4900 through 4999 or codes 6000 through 6999], have total assets greater than $10 million, and have available data on scaled total net financing [(equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets]. These selection criteria generate a sample of 116,788 firm-year observations from 1971 to 2008.

We define *Net Equity* and *Net Debt* as the difference between issues and repurchases or retirements as in

$$\textit{Net Equity}_t = \textit{Equity Issues}_t - \textit{Equity Repurchases}_t, \tag{1}$$

and

$$\textit{Net Debt}_t = \textit{Total Debt}_t - \textit{Total Debt}_{t-1}, \tag{2}$$

where *Equity Issues* is the total amount of funds received from issuance of common and preferred stocks (Compustat item SSTK), *Equity Repurchases* is the total amount of funds used to repurchase common and preferred stocks (item PRSTKC), and *Total Debt* is total long-term debt (item DD1 plus item DLTT). Because preferred stocks are hybrid securities, we also perform our analyses treating preferred stocks as debt. The results from this analysis are qualitatively and quantitatively similar to the ones from the baseline analysis. We then construct the net financing measure, *NF*, as the ratio of total capital raised to lagged assets:

$$NF_t = \frac{(\textit{Net Equity}_t + \textit{Net Debt}_t)}{\textit{Assets}_{t-1}}, \tag{3}$$

where *Assets* refers to the book value of total assets (item AT). As a robustness check, we also perform our analysis including dividend payments in our definition of net financing. The results from this analysis are qualitatively and quantitatively similar to the ones from the baseline analysis. Finally, we construct the equity ratio variable for each firm-year as the proportion of net equity to net capital raised:

$$ER_t = \frac{\textit{Net Equity}_t}{(\textit{Net Equity}_t + \textit{Net Debt}_t)}. \tag{4}$$

Following Baker and Wurgler (2000), we winsorize *ER* at zero and one to mitigate the effect of outliers, but our results are unaffected if we instead winsorize the equity ratio at 1% and 99% of its empirical distribution or if we use the rank value of *ER* across its entire empirical distribution. Most of the other variables we construct are common in the literature. The book-to-market ratio (*B/M*) is the book value of equity (item CEQ) divided by the market value of equity (item CSHO times item PRCC_F). Momentum (*MOM*) is the 12-month stock return immediately preceding the portfolio formation. Asset growth (*GROWTH*) is computed as the percentage change in total assets from the previous to the current fiscal year. Return on assets (*ROA*) is the operating income before depreciation (item OIBDP) scaled by the book value of total assets.

Table 1 presents summary statistics. In Panel A, we report statistics for the entire sample. Because our sample spans over 38 years, the means and variances of nonstationary variables such as assets and market value are not generally meaningful, but our sample represents the vast majority of the CRSP and Compustat sample, and the magnitudes and variation of our variables are consistent with other studies. Our net financing variable (*NF*) averages 6%, suggesting that, on average, firms annually raise 6% of their previous asset base. However, the low

Table 1
Summary statistics.
This table reports the summary statistics for the sample firms. *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. *ER* is the equity ratio [(equity issues − equity repurchases)/(equity issues − equity repurchases + debt issues − debt repurchases)]. *ASSETS* is the book value of total assets (in billions of dollars) at time *t*. *B/M* is the value of equity at time $t-1$ scaled by the market value of equity at time *t*. *MV* is the total market value of equity (in billions of dollars) at time *t*. *MOM* is the lagged one-year stock return at time *t*. *GROWTH* is the percentage change in the level of total assets from $t-1$ to *t*. *ROA* is equal to the operating income before depreciation at time *t* scaled by the book value of total assets at time *t*. To reduce the effect of outliers, *NF*, *B/M*, *GROWTH*, and *ROA* have been winsorized at the 1% and the 99% of their empirical distribution, and *ER* has been winsorized at zero and one.

	Mean	Standard deviation	5th	Median	95th	Number
Panel A: Entire sample						
NF	0.06	0.22	−0.12	0.01	0.45	116,788
ER	0.32	0.42	0.00	0.01	1.00	116,788
ASSETS	1.67	10.34	0.15	0.14	5.84	116,788
B/M	0.92	0.92	0.12	0.63	2.68	112,760
MV	1.63	10.01	0.01	0.10	5.26	115,336
MOM	0.16	0.91	−0.63	0.05	1.22	116,129
GROWTH	0.13	0.32	−0.24	0.08	0.68	116,788
ROA	0.11	0.14	−0.14	0.13	0.28	116,547
Panel B: NF > 0						
NF	0.16	0.25	0.01	0.06	0.70	63,575
ER	0.37	0.43	0.00	0.08	1.00	63,575
ASSETS	1.68	11.62	0.02	0.15	5.45	63,575
B/M	0.80	0.83	0.10	0.55	2.32	61,626
MV	1.39	8.63	0.01	0.12	4.47	62,884
MOM	0.18	1.09	−0.65	0.05	1.33	63,296
GROWTH	0.24	0.38	−0.18	0.15	1.01	63,575
ROA	0.09	0.15	−0.20	0.12	0.27	63,454
Panel C: NF < 0						
NF	−0.05	0.06	−0.20	−0.03	−0.01	50,718
ER	0.26	0.40	0.00	0.00	1.00	50,718
ASSETS	1.73	8.76	0.02	0.13	6.80	50,718
B/M	1.04	1.00	0.15	0.74	3.06	48,794
MV	1.99	11.71	0.005	0.08	6.87	50,080
MOM	0.13	0.64	−0.61	0.05	1.11	50,359
GROWTH	0.01	0.17	−0.29	0.01	0.23	50,718
ROA	0.13	0.12	−0.07	0.13	0.30	50,620

median value of 0.01 suggests that the typical firm does not return or raise much net capital.

In Panels B and C of Table 1, we present summary statistics partitioned on whether firms are net raising ($NF>0$, Panel B) or net distributing ($NF<0$, Panel C) capital. Firms that raise net capital ($NF>0$) raise roughly 40% of their new capital through equity on average (mean equity ratio, *ER*, is 0.37) and at least half of those firms raise at least 8% through equity (median $ER=0.08$). As expected, firms raising capital tend to be slightly smaller, have a lower book-to-market ratio, and have higher growth than do firms returning capital. These differences are important because previous studies have shown that these variables are also related to future returns.

Table 2 presents a correlation matrix for our whole sample and again for the partition based on the sign of net financing. Panel A shows that the correlation between net financing and the equity for the entire sample is 7%. However, Panels B and C shows this correlation is close to zero once we condition on whether firms raise capital ($NF>0$) or distribute capital ($NF<0$). As expected by the balance sheet identity, asset growth is highly correlated with net financing for firms raising capital, but the correlation is much lower for firms distributing capital. Also, the book-to-market ratio is highly correlated with both net financing and the equity ratio.

2.2. The relation between net financing and real investment

Because our measure of net financing is designed to capture the level effect of real investment, we must establish that our measure is a proxy for investment opportunities. As shown in Table 1, firms raising capital tend to have higher asset growth than firms distributing capital. To present a more detailed picture of the relation, we break our sample into deciles based on the level of net financing and then for each net financing decile we compute the mean change in capital expenditures over the fiscal year. Fig. 1 presents these results. Future capital expenditures increase monotonically with the current level of net financing. In untabulated tests, we also find that this monotonic relation holds for changes in capital expenditures over long periods (three or five years) and for investment intensities (ratio of capital expenditures to sales, assets, etc.) in the future. Consistent with Lyandres, Sun, and Zhang (2008), net financing is a strong proxy for future investment.

3. Net financing, market timing, and future returns

In this section, we test the hypothesis that future returns are related to proxies for investment opportunities and market timing. We begin with univariate portfolio sorts and then develop regression based tests.

3.1. Univariate sorts

In this subsection we use univariate portfolio sorts to test the hypothesis that firms' future stock returns are related to the level and composition of net financing. We first test differences in future abnormal stock returns across both the level and composition of net financing separately, and then we perform conditional sorts. In addition to the standard CAPM and FF3 models, we use the Chen, Novy-Marx, and Zhang (2010) investment-based factor model (q-factor model).

We sort stocks, at the end of June of each year, into four portfolios based on their level of net financing at the end of the last fiscal year-end and then calculate monthly value-weighted returns over the next 12 months for each of the four portfolios. To make sure our results are not sensitive to different return horizons, we replicate all of our analyses at the three- and five-year return horizon. Overall, our results at longer horizons are consistent with the results we obtain from the one-year return horizon. We then estimate time series monthly alphas using three empirical factor models:

$$\text{CAPM}: \quad r_{it}-r_{ft}=\alpha_i^{CAPM}+\beta_i MKT_t+\varepsilon_{it}, \tag{5}$$

$$\text{FF3}: \quad r_{it}-r_{ft}=\alpha_i^{FF}+b_i MKT_t+s_i SMB_t+h_i HML_t+\varepsilon_{it}, \tag{6}$$

Table 2
Correlation matrix.
This table reports Pearson correlation coefficients for selected variables. *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. *ER* is the equity ratio [(equity issues − equity repurchases)/(equity issues − equity repurchases + debt issues − debt repurchases)]. *ASSETS* is the book value of total assets (in millions of dollars) at time *t*. *B/M* is the value of equity at time $t-1$ scaled by the market value of equity at time *t*. *MV* is the total market value of equity (in millions of dollars) at time *t*. *MOM* is the lagged one-year stock return at time *t*. *GROWTH* is the percentage change in the level of total assets from $t-1$ to *t*. *ROA* is equal to the operating income before depreciation at time *t* scaled by the book value of total assets at time *t*. To reduce the effect of outliers, *NF*, *B/M*, *GROWTH*, and *ROA* have been winsorized at the 1% and the 99% of their empirical distribution, and *ER* has been winsorized at zero and one.

	NF	*ER*	*ASSETS*	*B/M*	*MV*	*MOM*	*GROWTH*	*ROA*
Panel A: Entire sample								
NF	1							
ER	0.07	1						
ASSETS	−0.02	−0.01	1					
B/M	−0.17	−0.23	−0.05	1				
MV	−0.03	0.05	0.66	−0.10	1			
MOM	0.08	0.05	−0.01	−0.24	0.02	1		
GROWTH	0.75	0.08	0.00	−0.32	0.02	0.18	1	
ROA	−0.19	−0.06	0.04	−0.26	0.08	0.15	0.19	1
Panel B: NF > 0								
NF	1							
ER	0.01	1						
ASSETS	−0.03	−0.06	1					
B/M	−0.19	−0.26	−0.03	1				
MV	−0.02	−0.03	0.66	−0.08	1			
MOM	0.09	0.09	−0.01	−0.22	0.02	1		
GROWTH	0.76	0.00	−0.01	−0.32	0.02	0.18	1	
ROA	−0.20	−0.16	0.03	−0.18	0.07	0.11	0.19	1
Panel C: NF < 0								
NF	1							
ER	−0.03	1						
ASSETS	0.03	0.08	1					
B/M	0.01	−0.17	−0.09	1				
MV	−0.01	0.14	0.73	−0.12	1			
MOM	−0.02	−0.05	−0.02	−0.30	0.02	1		
GROWTH	0.28	0.12	0.02	−0.34	0.06	0.23	1	
ROA	−0.01	0.14	0.05	−0.39	0.10	0.25	0.44	1

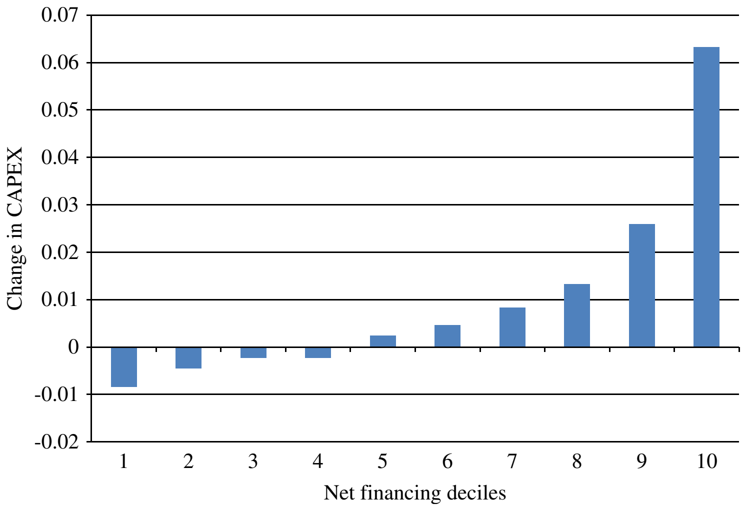

Fig. 1. The relation between net financing and changes in capital expenditures (CAPEX). This figure depicts the contemporaneous relation between levels of net financing and changes in capital expenditures. Net financing is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. Changes in capital expenditures are equal to changes in CAPEX from $t-1$ to t scaled by the level of assets at time $t-1$.

and

$$q\text{-factor model}: \quad r_{it}-r_{ft} = \alpha_i^q + \beta_i^{MKT} MKT_t + \beta_i^{INV} INV_t + \beta_i^{ROAF} ROAF_t + \varepsilon_{it}, \tag{7}$$

where r_f is the monthly return on one-month US Treasury bills, *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate, *SMB* is the difference between the monthly return on a

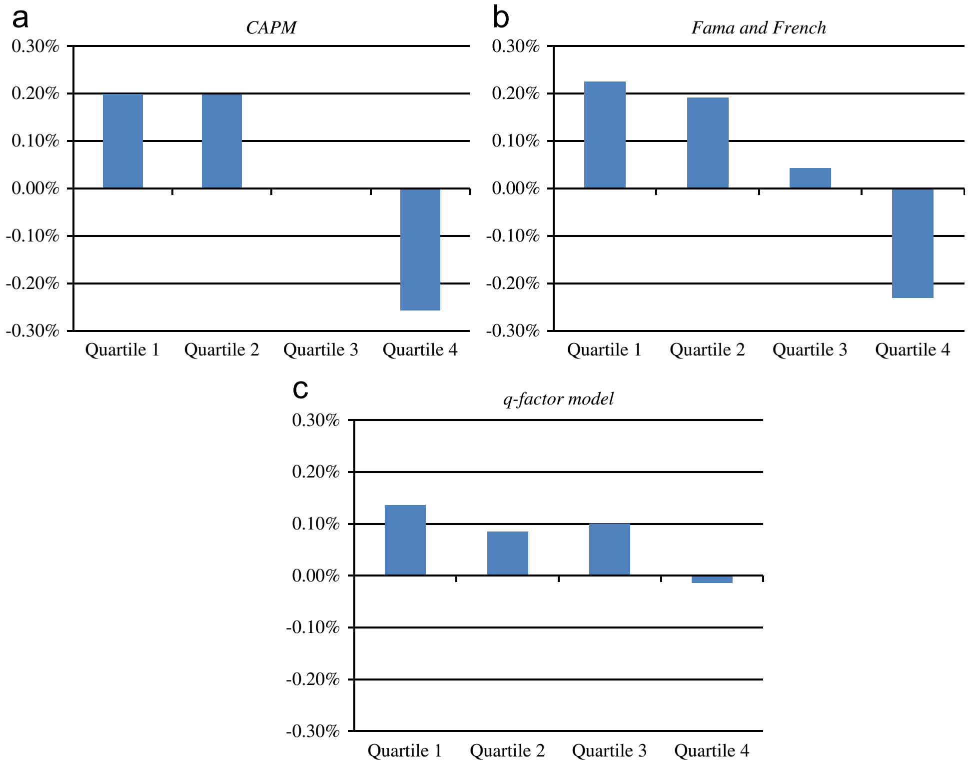

Fig. 2. The relation between monthly alphas and net financing. These graphics depict monthly alphas by quartiles based on the level of net financing (*NF*). *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. We sort stocks, at the end of June of each year, into four portfolios based on their level of net financing at the end of the last fiscal year-end and then calculate monthly value-weighted returns over the next 12 months for each of the four portfolios. We estimate time series monthly alphas using the following asset pricing models: the capital asset pricing model (CAPM) (portfolio return minus risk-free rate on *MKT*), the Fama and French model (portfolio return minus risk-free rate on *MKT*, *HML*, and *SMB*), and the *q*-factor model (portfolio return minus risk-free rate on *MKT*, *INV*, and *ROAF*). The risk-free rate is the monthly return on one-month US Treasury bills. *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate. *SMB* is the difference between the monthly return on a portfolio of small firms and the monthly return on a portfolio of large firms. *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks. *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms. *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low returns-on-assets firms. Data for the risk-free rate, *MKT*, *HML*, and *SMB* are from Kenneth French. Data for *INV* and *ROAF* are from Long Chen.

portfolio of small firms and the monthly return on a portfolio of large firms, *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks, *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms, and *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low return-on-assets firms. Data for the risk-free rate, *MKT*, *HML*, and *SMB* are from Kenneth French's website.[2] Data for *INV* and *ROAF* are provided by Long Chen.

Fig. 2 presents monthly alphas by quartiles of net financing (*NF*) for the different factor models. Consistent with the predictions of both investment-based theories and managerial market timing, the alphas from the CAPM and the FF3 model decline monotonically as net financing increases. Similar to Chen, Novy-Marx, and Zhang (2010), the investment factors appear to help explain the abnormal under-performance after firms raise capital.

Even after controlling for the effect of investment, managers could be able to choose debt and equity to exploit potential mispricing. In Table 3 we make our first effort to separate the market timing and real investment stories. This table presents a test of the relation between monthly alphas and the level and composition of net financing. We form portfolios at the end of June of each year by first partitioning the sample into quartiles based on the level of net financing at the end of the last fiscal year-end and then form subportfolios within each net financing portfolio based on the equity ratio. We then calculate monthly value-weighted returns over the next 12 months for each of the 16 portfolios. We perform the sort separately for firms that are raising capital (Panel A: $NF>0$) and firms that are returning capital (Panel B: $NF<0$). As in Fig. 2, time series monthly alphas are estimated using the CAPM, the FF3 model, and the *q*-factor model.

The results in Table 3, Panel A show a substantial difference in future abnormal returns between firms that

[2] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Table 3
Equity ratio, net financing, and monthly alphas: portfolio analysis.

This table reports monthly alphas (as percentages) by quartiles of net financing (*NF*) and different levels of the equity ratio (*ER*). The equity ratio is equal to net equity issues (equity issues − equity repurchases) scaled by total net financing (equity issues − equity repurchases + debt issues − debt repurchases). Net financing is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. *ER* has been winsorized at zero and one. We form portfolios at the end of June of each year by first partitioning the sample into quartiles based on net financing at the end of the last fiscal year-end and then we form subportfolios within each net financing portfolio based on equity ratio quartiles. We then calculate monthly value-weighted returns over the next 12 months for each of the 16 portfolios. We estimate time series monthly alphas using the following asset pricing models: the capital asset pricing model (CAPM) (portfolio return minus risk-free rate on *MKT*), the Fama and French model (portfolio return minus risk-free rate on *MKT*, *HML*, and *SMB*), and the *q*-factor model (portfolio return minus risk-free rate on *MKT*, *INV*, and *ROAF*). The risk-free rate is the monthly return on one-month US Treasury bills. *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate. *SMB* is the difference between the monthly return on a portfolio of small firms and the monthly return on a portfolio of large firms. *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks. *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms. *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low returns-on-assets firms. Data for the risk-free rate, *MKT*, *HML,* and *SMB* are from Kenneth French. Data for *INV* and *ROAF* are from Long Chen. ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Equity ratio level				(Largest–smallest)
	$ER=0$	$0<ER\leq 0.50$	$0.50<ER\leq 1$	$ER=1$	
Panel A: NF > 0					
CAPM					
NF quartiles					
Smallest	0.23	0.07	0.06	0.06	−0.17
2	0.25	−0.08	0.24	−0.31	−0.56**
3	−0.12	−0.12	−0.22	−0.22	−0.11
Largest	−0.07	−0.36	−1.06	−0.79	−0.72**
(Largest − smallest)	−3.05*	−0.43**	−1.11***	−0.85***	
FF3 (Fama and French)					
NF quartiles					
Smallest	0.12	0.01	0.09	0.21	0.09
2	0.11	−0.10	0.41	−0.04	−0.15
3	−0.25	−0.07	0.05	−0.03	0.23
Largest	−0.16	−0.32	−0.89	−0.48	−0.33
(Largest − smallest)	−0.28*	−0.32	−0.98***	−0.70***	
q-Factor model					
NF quartiles					
Smallest	0.18	0.17	0.16	0.31	0.13
2	0.08	−0.09	0.57	0.11	0.03
3	−0.19	0.16	0.42	0.19	0.38
Largest	−0.11	−0.12	−0.44	−0.27	−0.16
(Largest–smallest)	−0.30	−0.29	−0.60**	−0.58**	
Panel B: NF < 0					
CAPM					
NF quartiles					
Smallest	0.11	0.38	0.57	0.47	0.365
2	0.05	0.39	0.39	0.45	0.401*
3	0.44	0.34	0.17	−0.01	−0.437**
Largest	0.14	0.54	0.37	0.39	0.249
(Largest − smallest)	0.037	0.162	−0.198	−0.079	
FF3 (Fama and French)					
NF quartiles					
Smallest	0.11	0.15	0.73	0.52	0.41
2	−0.05	0.08	0.37	0.39	0.44*
3	0.35	0.27	0.18	−0.04	−0.39*
Largest	0.06	0.37	0.25	0.29	0.22
(Largest–smallest)	−0.04	0.22	−0.48**	−0.002	
q-Factor model					
NF quartiles					
Smallest	0.08	0.20	0.42	0.46	0.38
2	0.03	0.20	0.47	0.37	0.34
3	0.34	0.23	0.06	−0.14	−0.48*
Largest	0.01	0.38	0.31	0.24	0.23
(Largest–smallest)	−0.07	0.18	−0.11	−0.24	

are raising substantial amounts of capital (largest *NF* quartile) and firms that are not raising much (smallest *NF* quartile). Consistent with Fig. 2, this net financing effect is smaller when we use the *q*-factor model instead of the CAPM or the FF3 model. Although some evidence exists that equity issuers ($ER=1$) under-perform debt issuers ($ER=0$) when we use the CAPM, these results disappear when we use the FF3 or the q-factor model.

Table 3, Panel B presents results for firms that are distributing capital ($NF<0$). For these firms, there are no systematic differences in monthly alphas across quartiles of net financing. This result is not surprising because the cross-sectional variation in net financing among firms distributing capital is relatively small. The standard deviation of net financing for firms raising capital ($NF>0$) is 0.250, but the standard deviation of net financing for firms distributing capital ($NF<0$) is only 0.063. Panel B also shows that equity repurchasers ($ER=1$) outperform debt repurchasers ($ER=0$) in the second quartile of net financing under the CAPM and FF3 models. However, debt repurchasers outperform equity repurchasers in the third quartile of net financing regardless of the model used to estimate alphas. Overall, the univariate results in Table 3 do not reveal systematic differences in alpha between the equity and debt composition groups conditional on whether firms are raising or distributing capital.

3.2. Cross-sectional regression evidence

Based on the univariate tests in Panel A of Table 3, firms that raise substantial amounts of external capital under-perform firms that do not raise much, but there is little difference in performance based on the composition of debt compared with equity. The univariate analysis in Panel B of Table 3 also suggests that the effect could be nonlinear, in that there could be a larger difference for firms raising capital as opposed to distributing capital. Thus, we construct a regression-based test of under-performance that allows for a nonlinear relation between net financing and returns and the financing composition and returns. If there is a significant market timing effect that occurs only for firms raising capital (but not for firms distributing capital), then a linear full sample test could obscure that result because we would fail to condition on positive or negative net financing. Our regressions allow for both the magnitude and sign of the level and composition of financing to vary across capital raisers compared with capital distributors.

We include both the level (NF) and the composition (ER) variables in our regression tests. To allow for nonlinearity, we also include a dummy variable for positive net financing ($POSNF$) along with interaction terms for both the NF and ER. We also include five additional variables ($X'\gamma$; $X' =$ [log(MV), log(B/M),MOM,$GROWTH$,ROA]) that control for other factors that could affect future returns. Monthly returns for each stock, $R_{i,t}$, are computed for the following 12 months. Our regression model is

$$R_{i,t+1} = \alpha + \beta_1 ER_{i,t} + \beta_2 ER_{i,t} \times POSNF + \beta_3 NF_{i,t} + \beta_4 NF_{i,t} \times POSNF + \beta_5 POSNF + X'_{i,t}\gamma + \varepsilon_{i,t+1}. \tag{8}$$

Both the real investment story and market timing story predict that future returns should covary negatively with the level of net financing. Thus, the level effect predicts negative point estimates for β_3, $\beta_3+\beta_4$, and β_5. However, the market timing, or composition effect, predicts that firms that are repurchasing shares instead of debt should outperform ($\beta_1>0$), while firms raising capital through equity instead of debt should under-perform ($\beta_1+\beta_2<0$). Section 3.2.1 presents our results for the entire sample, and Section 3.2.2 presents our results for subsamples based on size, book-to-market, momentum, and investor sentiment.

We estimate Eq. (8) using Fama and MacBeth (1973) style regressions. In the first stage, we estimate the cross-section parameters of Eq. (8) every month by regressing monthly returns over the next 12 months on the characteristic data available at the end of fiscal year t. In the second stage, we compute time series means of the cross-sectional regression coefficients. Our estimation period (July 1971 to December 2009) produces 462 cross-section estimates of the regression coefficients. We construct all standard errors following Hansen and Hodrick (1980).

3.2.1. Full sample results

Table 4 presents the results of our regression tests for the whole sample. In the first column, we present the results using only the financing composition variables, ER and $ER \times POSNF$. The results provide evidence of a composition effect in the data. For firms that are distributing net capital ($POSNF=0$), we find a positive and significant relation between the equity ratio and future stock returns (coefficient on $ER=0.317$). This coefficient suggests that a one standard deviation increase in the equity ratio corresponds to an increase in future annual returns of 1.60 percentage points ($0.317 \times 0.420 \times 12 = 1.60$). Conversely, for firms that are raising net capital ($POSNF=1$), we find a negative and significant relation between the equity ratio and future monthly returns (coefficient on ER+coefficient on $ER \times POSNF = -0.407$). This magnitude suggests that a one standard deviation increase in the equity ratio corresponds to a firm under-performing by 2.05 percentage points on an annual basis ($-0.407 \times 0.420 \times 12 = -2.05$). The magnitudes of both effects are economically large and confirm the presence of market timing in tests that do not condition on the level of net financing. Based on this test, firms that issue equity seem to under-perform and firms that repurchase shares seem to outperform.

In Column 2 of Table 4 we control for the level of net financing (NF), the direction of net financing ($POSNF$), and the interaction of the two ($NF \times POSNF$). Consistent with the real investment story, there is a negative and significant effect on future returns for firms that are raising capital. Table 3 shows that the relation between the net financing and future returns is nonlinear. The results indicate that firms raising capital tend to under-perform firms distributing capital (coefficient of $POSNF$ is -0.335) and that the relation between the level of net financing and future returns is negative and significant only for firms raising capital (sum of the coefficients of $NF+NF \times POSNF$ is -1.55). However, inconsistent with the market timing story, the composition variables ER and $ER+ER \times POSNF$ are no longer significant. This result is not driven by multicollinearity or changes in statistical power. While the composition variables are not statistically significant, their standard errors change very little from the previous specification. Instead, the magnitudes of their coefficients have both become much smaller. In short, it appears that future returns covary more with

Table 4
Equity ratio, net financing, and future stock returns: cross-sectional analysis.

This table reports estimates of cross-sectional regressions relating monthly returns over the next 12 months after the end of the fiscal year *t* to several firm characteristics at the end of fiscal year *t*. *ER* is the equity ratio [(equity issues − equity repurchases)/(equity issues − equity repurchases + debt issues − debt repurchases)]. *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. *POSNF* is a dummy variable equal to one if *NF* is greater than zero and zero otherwise. *B/M* is the value of equity at time $t-1$ scaled by the market value of equity at time *t*. *MV* is the total market value of equity. *MOM* is the lagged one-year stock return at time *t*. *GROWTH* is the percentage change in the level of total assets from $t-1$ to *t*. *ROA* is equal to the operating income before depreciation scaled by the book value of total assets. We use the Fama and MacBeth (1973) procedure to estimate the regression coefficients. In the first stage, we estimate cross-sectional regression coefficients each month using all the observations in that month. In the second stage, we compute time series means of the cross-sectional regression coefficients. To reduce the effect of outliers, *NF*, *B/M*, *GROWTH*, and *ROA* have been winsorized at 1% and the 99% of their empirical distribution, and *ER* has been winsorized at zero and one in the first three columns and winsorized at 1% and the 99% of its empirical distribution in the last three columns. Robust standard errors are constructed following Hansen and Hodrick (1980). ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Dependent variable: future monthly returns					
	Equity ratio truncated at [0, 1]			Equity ratio winsorized at 1% and 99%		
Intercept	1.30***	1.585***	1.665***	1.276***	1.576***	1.094***
	(0.328)	(0.324)	(0.449)	(0.325)	(0.307)	(0.447)
ER_t	0.317***	−0.035	−0.001	0.056*	0.027	0.014
	(0.097)	(0.104)	(0.075)	(0.029)	(0.026)	(0.018)
$ER_t + ER_t \times POSNF$	−0.407**	−0.068	0.190*	−0.093*	−0.015	0.036
	(0.162)	(0.156)	(0.103)	(0.048)	(0.042)	(0.026)
NF_t		−0.420	−0.662		−0.411	−0.638
		(0.690)	(0.582)		(0.704)	(0.588)
$NF_t + NF_t \times POSNF$		−1.549***	−0.995***		−1.551***	−1.039***
		(0.199)	(0.146)		(0.203)	(0.147)
POSNF		−0.335***	−0.245***		−0.333***	−0.192***
		(0.055)	(0.045)		(0.051)	(0.046)
$\log(B/M)_t$			0.299***			0.283***
			(0.076)			(0.079)
$\log(MV)_t$			−0.067			−0.070*
			(0.041)			(0.041)
MOM_t			0.149			0.150***
			(0.122)			(0.123)
$GROWTH_{t-1}$			−0.684***			−0.689***
			(0.102)			(0.102)
ROA_{t-1}			1.269**			1.182*
			(0.515)			(0.527)
Number	462	462	462	462	462	462

differences in the level of net financing than with the composition of net financing. Without controlling for the effects of the level of financing, the composition effect could proxy for the omitted variable.

In the third column (Table 4, Column 3) we include a set of five additional cross-sectional controls. The main results do not change qualitatively. Consistent with past studies, value firms outperform growth firms, small firms outperform large firms, stocks with higher momentum outperform those with lower momentum, high ROA firms outperform low ROA firms, and high asset growth firms under-perform low asset growth firms. After controlling for firm characteristics, we find that the coefficient of $ER + ER \times POSNF$ is positive and significant (0.190), suggesting that equity issuers weakly outperform debt issuers. Regardless of whether or not we include the control variables, we find support for the level effect of net financing on future returns.

The last three columns of Table 4 repeat the first three columns, but we compute *ER* differently. Restricting the equity ratio to be between zero and one, as we do in the previous tests, could bias against finding evidence favoring the market timing hypothesis.[3] We therefore run our tests again using a measure of the equity ratio that we winsorize at 1% and 99% of its empirical distribution.

The evidence in favor of market timing becomes weaker when we use the measure of *ER* that we winsorize at 1% and 99% of its empirical distribution. For instance, comparing the first model (which provides the most favorable support for market timing) across the two methods, the coefficients become only marginally significant and much smaller in magnitude—about 20% of the magnitude—when we move from restricting *ER* between zero and one to allowing *ER* to take its entire range from the 1st to 99th percentile. In unreported tests, we also replicate our analysis using the rank value of *ER* across its entire empirical distribution. Doing so further weakens support for market timing. Thus, the measure of the equity ratio that is constrained between zero and one provides the strongest support for the market timing hypothesis. If there is any bias in our main measure of the equity ratio, it is toward finding evidence consistent with the market timing story.

Like Baker and Wurgler (2000), we also favor restricting the extreme values of the equity share based on net flows to reduce the effect of outliers. This is important because, even at the aggregate level, the equity ratio

[3] We thank Jeff Wurgler for suggesting this line of inquiry.

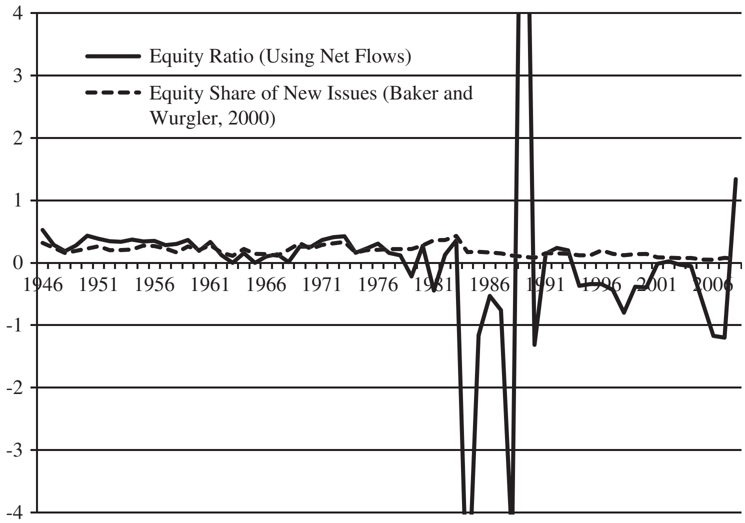

Fig. 3. Time series of the equity ratio based on net debt and net equity flows and the equity share of new issues. This figure depicts the time series of the equity ratio based on net debt and net equity flows and the equity share of new issues over the period 1946 to 2008. The equity ratio based on net debt and net equity flows is the ratio of net equity flows to total net flows (net debt and net equity flows). Net debt and net equity flows are from the Federal Reserve Flow of Funds (Tables F.212 and F.213). The equity share of new issues is the ratio of aggregate new equity issues to total new issues (aggregate new equity and debt issues) as defined in Baker and Wurgler (2000).

based on net flows does not always lie between zero and one because sometimes aggregate share repurchases are greater than aggregate equity issues. To illustrate this point, we use data from the Federal Reserve Board's flow of funds to construct a measure of the net equity ratio based on net equity and net debt flows. Fig. 3 presents the time series of this variable and the equity share of new issues (*S*) used in Baker and Wurgler (2000). This figure shows that the aggregate equity ratio based on net flows is out of the [0,1] bound in 25 out the 63 years in the sample. Consistent with the argument in Baker and Wurgler (2000, p. 2250), this result highlights the importance of restricting the values of the equity share based on net flows to get an economically meaningful measure.

3.2.2. *Sample splits*

In this subsection we repeat the analysis presented in Table 4 for various subsamples of the data. Although the full sample analysis provides little support for the market timing hypothesis, some types of firms could be better market timers than others. For example, the market timing effect might be stronger for small stocks with low analyst coverage, or growth stocks in which investors are optimistic, or during periods of high investor sentiment. Our sample partitions give this timing effect the opportunity to present itself if it is stronger in such stocks.

Table 5 repeats the analysis for partitions of the sample based on quartiles of the book-to-market ratio (*B/M*), size (*MV*), and momentum (*MOM*). Further, we also take a time series approach. Instead of splitting the sample on cross-sectional characteristics, we split the sample based on whether investor sentiment is high or low (relative to median sentiment). Following Baker and Wurgler (2006), we use a composite index (*SENT*) that captures the common component of the following six proxies for investor sentiment: (1) the closed-end fund discount, (2) the share volume to average shares listed in the NYSE (share turnover), (3) the number of initial public offerings (IPOs), (4) the average first-day returns of IPOs, (5) the share of equity issues in total equity and debt issues (equity share), and (6) the difference of the market-to-book ratios of dividend and nondividend payers. The main advantage of using a composite index is that we do not need to rely on one particular variable to measure investor sentiment.

To conserve space, we report results for only the top and bottom quartiles. For most partitions, we find a significant composition effect when we do not include the other control variables (see Panel A of Table 5). The coefficients on *ER* are generally larger in magnitude for growth stocks (low *B/M*), small firms (low *MV*), low momentum firms (low *MOM*), and during high sentiment periods. The coefficients on $ER+ER\times POSNF$ are generally larger in magnitude for high momentum firms (high *MOM*) and during years of low sentiment.

Nevertheless, Panel B of Table 5 shows that the level effect again dominates the composition effect. In both high and low *B/M* portfolios, and in the low momentum portfolio, the coefficients of the equity ratio for firms with positive net financing ($ER+ER\times POSNF$) are significant, but the signs are positive. Therefore, in these portfolios, equity issuers tend to outperform debt issuers. In the sentiment portfolios, the evidence is conflicting. Although equity repurchasers tend to outperform debt repurchasers marginally during high sentiment periods, the opposite occurs during low sentiment periods. Overall, the sample splits do not reveal any consistent evidence of market timing.

However, Panel B of Table 5 does show that firms raising capital tend to under-perform firms distributing capital (coefficient of *POSNF* is negative and significant in most specifications). Further, we find some evidence

Table 5

Equity ratio, net financing, and future stock returns: stratified cross-sectional analysis.

This table reports estimates of cross-sectional regressions relating monthly returns over the next 12 months after the end of fiscal year *t* to several firm characteristics at the end of fiscal year *t* stratified by book-to-market ratio, size, price momentum, and level of investor sentiment. *ER* is the equity ratio [(equity issues − equity repurchases)/(equity issues − equity repurchases + debt issues − debt repurchases)]. *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. *POSNF* is a dummy variable equal to one if *NF* is greater than zero and zero otherwise. *B/M* is the value of equity at time $t-1$ scaled by the market value of equity at time *t*. *MV* is the total market value of equity. *MOM* is the lagged one-year stock return at time *t*. *GROWTH* is the percentage change in the level of total assets from $t-1$ to *t*. *ROA* is equal to the operating income before depreciation scaled by the book value of total assets. We use the Fama and MacBeth (1973) procedure to estimate the regression coefficients. In the first stage, we estimate cross-sectional regression coefficients each month using all the observations in that month. In the second stage, we compute time series means of the cross-sectional regression coefficients. To reduce the effect of outliers, *NF*, *B/M*, *GROWTH*, and *ROA* have been winsorized at the 1% and the 99% of their empirical distribution, and *ER* has been winsorized at zero and one. Robust standard errors are constructed following Hansen and Hodrick (1980). ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Dependent variable: future monthly returns							
	Stratified by *B/M*		Stratified by size		Stratified by momentum		Stratified by sentiment	
	Smallest quartile	Largest quartile	Smallest quartile	Largest quartile	Smallest quartile	Largest quartile	Below median	Above median
Panel A: Market timing tests								
Intercept	0.806**	1.604***	1.654***	1.052***	1.101***	1.391***	1.350***	0.986**
	(0.322)	(0.375)	(0.394)	(0.267)	(0.419)	(0.323)	(0.417)	(0.426)
ER_t	0.446*	0.324**	0.359**	0.221**	0.405**	0.342***	0.076	0.644***
	(0.241)	(0.147)	(0.165)	(0.102)	(0.195)	(0.132)	(0.123)	(0.154)
$ER_t+ER_t \times POSNF$	−0.180	0.127	−0.303	−0.170	−0.254	−0.399**	−0.563***	−0.265
	(0.157)	(0.212)	(0.193)	(0.109)	(0.187)	(0.170)	(0.158)	(0.268)
Number	462	462	462	462	462	462	260	272
Panel B: Market timing versus real investment tests, including controls								
Intercept	1.309***	2.174***	2.976***	1.105**	1.591***	1.764***	1.739***	1.420**
	(0.488)	(0.436)	(0.530)	(0.508)	(0.480)	(0.436)	(0.572)	(0.639)
ER_t	−0.013	0.023	0.068	0.140	−0.006	0.115	−0.214*	0.031*
	(0.379)	(0.134)	(0.152)	(0.119)	(0.181)	(0.138)	(0.109)	(0.164)
$ER_t+ER_t \times POSNF$	0.336**	0.363**	0.269	0.120	0.401***	−0.023	−0.113	0.309
	(0.136)	(0.184)	(0.186)	(0.118)	(0.159)	(0.128)	(0.123)	(0.208)
NF_t	−1.604	−0.142	−0.873	−1.306	−0.011	−0.673	−2.156*	0.503
	(1.600)	(1.010)	(1.050)	(0.894)	(1.190)	(0.838)	(1.200)	(0.847)
$NF_t+NF_t \times POSNF$	−0.685***	−2.447***	−1.807***	−0.594**	−2.079***	−0.731***	−1.137***	−0.817**
	(0.200)	(0.582)	(0.408)	(0.294)	(0.487)	(0.259)	(0.345)	(0.391)
POSNF	−0.365***	−0.279***	−0.289**	−0.043	−0.327***	−0.035	−0.159*	−0.316**
	(0.010)	(0.099)	(0.114)	(0.061)	(0.107)	(0.099)	(0.087)	(0.125)
$\log(B/M)_t$	0.262***	0.001	0.161*	0.362***	0.149	0.267***	0.321***	0.183
	(0.090)	(0.171)	(0.086)	(0.092)	(0.097)	(0.091)	(0.101)	(0.140)
$\log(MV)_t$	0.005	−0.164***	−0.503***	−0.027	−0.138**	−0.040	−0.084	−0.011
	(0.046)	(0.051)	(0.114)	(0.043)	(0.062)	(0.042)	(0.056)	(0.058)
MOM_t	0.177*	0.047	0.014	0.425***	−0.404	0.023	0.265*	0.119
	(0.100)	(0.252)	(0.174)	(0.150)	(0.632)	(0.084)	(0.154)	(0.156)
$GROWTH_{t-1}$	−0.687***	−1.016***	−1.107***	−0.356**	−0.102***	−0.340**	−0.676***	−0.542***
	(0.141)	(0.193)	(0.191)	(0.142)	(0.153)	(0.142)	(0.182)	(0.162)
ROA_{t-1}	0.922*	0.159	0.803	2.244***	0.363	0.868	1.350**	0.226
	(0.480)	(0.857)	(0.730)	(0.523)	(0.655)	(0.635)	(0.662)	(0.967)
Number	462	462	462	462	462	462	260	272

shows that the relation between the level of net financing and future returns is stronger for value stocks (high *B/M*), small firms (low *MV*), low momentum (low *MOM*), and during periods of low investor sentiment (low *SENT*). In sum, the level effect is consistently present in the data.

4. Matched sample analysis

To gauge the robustness of our main result, we perform a matched sample analysis in which we compare the future returns of net equity issuers with the future returns of net debt issuers, conditional on the level of net financing. One advantage of this approach over the regression analysis is that it circumvents problems that could arise from a nonlinear relation between the equity ratio and future returns. Another advantage of this approach is that we do not need to constrain our measure of the equity ratio, so there should be less concern about outliers or scaling problems.

4.1. Matched sample methodology

To compare apples to apples, we identify pairs of firms that have similar characteristics, in that they raise (or distribute) similar levels of capital, but differ substantially in the choice between debt and equity. To form our matched pairs, we first separate the sample into two groups based on the direction of net financing ($NF>0$ and $NF<0$). For firms that are raising capital ($NF>0$), we subdivide the sample again into net equity issuers

Table 6
Stratified matched sample analysis.
This table reports the results from the matched sample analysis. Monthly alphas (as percentages) are reported for the entire sample and for portfolios based on book-to-market ratio, firm size, price momentum, and level of investor sentiment. We find a net equity issuer (net equity repurchaser), at the end of June of each year, that closely resembles a net debt issuer (net debt repurchaser) in total net financing. After matching we create a portfolio that is long in net equity issuers (net equity repurchaser) and short in net debt issuer (net debt repurchaser) and then calculate monthly value-weighted returns over the next 12 months for the portfolio. We estimate time series monthly alphas using the following asset pricing models: the capital asset pricing model (CAPM) (portfolio return minus risk-free rate on *MKT*), the Fama and French model (portfolio return minus risk-free rate on *MKT*, *HML*, and *SMB*), and the *q*-factor model (portfolio return minus risk-free rate on *MKT*, *INV*, and *ROAF*). The risk-free rate is the monthly return on one-month US Treasury bills. *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate. *SMB* is the difference between the monthly return on a portfolio of small firms and the monthly return on a portfolio of large firms. *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks. *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms. *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low returns-on-assets firms. Data for the risk-free rate, *MKT*, *HML*, and *SMB* are from Kenneth French. Data for *INV* and *ROAF* are from Long Chen. *NF* is equal to total net financing (equity issues − equity repurchases + debt issues − debt repurchases) scaled by the lagged value of total assets. Robust standard errors are constructed following Hansen and Hodrick (1980). ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

		Stratified by book to market		Stratified by size		Stratified by momentum		Stratified by sentiment	
	Entire sample	Smallest quartile	Largest quartile	Smallest quartile	Largest quartile	Smallest quartile	Largest quartile	Below median	Above median
Panel A: NF > 0									
CAPM	−0.185	−0.057	0.0349	0.041	0.821	−0.842***	0.152	−0.191	−0.268
	(0.138)	(0.203)	(0.197)	(0.323)	(0.158)	(0.254)	(0.239)	(0.184)	(0.268)
FF3 (Fama and French)	0.005	0.282	−0.088	0.036	0.341**	−0.750***	0.505***	0.033	−0.026
	(0.122)	(0.176)	(0.204)	(0.251)	(0.146)	(0.237)	(0.930)	(0.178)	(0.171)
q-Factor model	0.144	0.177	0.541***	0.724**	0.246	−0.099	0.482*	0.056	0.170
	(0.134)	(0.211)	(0.195)	(0.352)	(0.167)	(0.244)	(0.259)	(0.189)	(0.191)
Panel B: NF < 0									
CAPM	0.137	0.135	0.458*	0.688***	0.147	−0.487**	0.631***	0.0001	0.232
	(0.149)	(0.234)	(0.243)	(0.261)	(0.235)	(0.246)	(0.233)	(0.243)	(0.195)
FF3 (Fama and French)	0.267*	0.383*	0.215	0.522**	0.321	−0.409	0.768***	0.185	0.387**
	(0.150)	(0.223)	(0.222)	(0.229)	(0.242)	(0.262)	(0.244)	(0.238)	(0.194)
q-Factor model	0.170	−0.039	0.651**	1.071***	0.001	−0.197	0.473*	0.039	0.309
	(0.155)	(0.241)	(0.258)	(0.264)	(0.269)	(0.259)	(0.244)	(0.242)	(0.205)

($ER > 0.5$) and net debt issuers ($ER < 0.5$). For each firm raising net equity, we form a matched pair by finding a firm raising net debt that has the closest absolute value of net financing ratio in the same year. For the sample of firms distributing capital, we follow the same approach. The result is a sample of matched pairs that distribute the same amount of capital relative to assets but differ in the composition of capital distributed. With our sample of matched pairs, we create a portfolio that is long in net equity issuers (net equity repurchasers) and short in net debt issuers (net debt repurchasers), and then calculate monthly value-weighted returns over the next 12 months for the portfolio. Our null hypothesis is that the alphas of these portfolios are not different from zero.

The market timing story predicts a composition effect in which equity issuers under-perform relative to debt issuers and equity repurchasers outperform relative to debt repurchasers. As a result, we expect $\alpha > 0$ when $NF < 0$ (abnormal outperformance when distributing firms repurchase net equity) and we expect $\alpha < 0$ when $NF > 0$ (abnormal under-performance when net issuers raise equity).

4.2. Matched sample results

The first column of Table 6 presents the results for the full sample. In Panel A we report the monthly alphas for the positive net financing matched portfolios (portfolios that are long in net equity issuers and short in net debt issuers). In Panel B we report the monthly alphas for the negative net financing matched portfolios (portfolios that are long in net equity repurchasers and short in net debt repurchasers). In the first columns of Panels A and B we find no evidence of abnormal performance based on the composition, once we match firms on the level of net financing. Although there is some evidence in the first column of Panel B that equity repurchasers outperform debt repurchasers when we use the FF3 model, this result is not robust to controlling for the investment factors.

In the remaining columns in Table 6 we repeat the exercise for the same sample splits as in the regression analysis. We again partition the sample based on the level of book-to-market, size, momentum, and investor sentiment. As in Table 5, this analysis provides conflicting evidence supporting the predictions of the market timing hypothesis. For value firms (high *B/M*), small firms (low *MV*), and high momentum firms (high *MOM*), Panel A shows that equity issuers outperform debt issuers while Panel B shows that equity repurchasers outperform debt repurchasers. Overall, the matched sample analysis is consistent with the regression analysis. Taken together, the composition (i.e., market timing) effect does not appear to be a primary feature of the data after we condition on the level of net financing.

5. Net financing and future returns following specific corporate financing events

In Sections 3 and 4, we demonstrate that the level of net financing is important in explaining future returns, but that the composition is not. However, there could be important differences across types of financing, and those differences could be hidden by our focus on net flows. In this section, we examine a host of specific corporate financing events for which prior research shows subsequent abnormal returns.

A firm that is timing the market issues debt when the cost of equity is high and issues equity when the cost of equity is low. This prediction is consistent with the under-performance following initial and seasoned equity offers but runs contrary to the abnormal performance following banks loans (Billet, Flannery, and Garfinkel, 2006) and private placements (Hertzel, Lemmon, Linck, and Rees, 2002). Our empirical strategy in this section is to identify firms that are raising (or distributing) capital based on the specific instrument that they use. Similar to our analysis in Sections 3 and 4, we then test whether the choice of financing instrument is driving the abnormal returns, or whether the abnormal returns are associated with the effect of real investment on expected returns.

5.1. *Large corporate financing events (inferred from Compustat)*

Using our sample of 116,788 firm-year observations from 1971 to 2008 in the Compustat database, we identify subsamples of firms in the top 10% of the distribution of equity issuers, equity repurchasers, debt issuers, debt repurchasers, net equity issuers, net debt issuers, dividend increasers, and dividend decreasers. Lyandres, Sun, and Zhang (2008) examine investment-based explanations for under-performance following initial public offerings (IPOs), seasoned equity offerings (SEOs), and convertible bond issues, but not equity repurchases, debt repurchases, increases in dividends, or decreases in dividends. Further, we focus on the largest corporate events to examine whether market timing occurs when firms raise or return large amounts of money to the capital markets. This empirical design should give the market timing effect the best opportunity to appear in the data.

To perform this analysis, we form portfolios at the end of June of each year by identifying the firms in the top 10% of each of the corporate events, and then calculate monthly value-weighted returns over the next 12 months for each of the portfolios. We estimate time series monthly alphas using the CAPM, FF3, and the q-factor model.

Panel A of Table 7 presents our estimation results. When we use the CAPM and FF3 to estimate alphas, we find evidence of under-performance for firms in the top 10% of the distribution of equity issuers, debt issuers, net equity issuers, and net debt issuers. We also find evidence of outperformance for firms in the top 10% of the distribution of equity repurchasers. These results are largely consistent with the results found in the market timing literature. We find no evidence of abnormal returns (under-performance or outperformance) following debt repurchases, increases in dividends, or decreases in dividends. The lack of evidence of abnormal performance following dividend changes is not surprising. Several papers show that the dividend drift is not robust (e.g., Boehme and Sorescu, 2002).

However, when we use the q-factor model to calculate alphas, we find no evidence of under-performance for firms in the top 10% of the distribution of equity issuers, debt issuers, net equity issuers, and net debt issuers. Consistent with the argument in Chen, Novy-Marx, and Zhang (2010), these results indicate that the lower returns following these events appear to be mainly driven by the effect of real investment on expected returns. There is still evidence of outperformance for firms in the top 10% of the distribution of equity repurchasers even when we use the q-factor model to estimate abnormal returns. Although this result is consistent with the predictions of the market timing hypothesis, it is also consistent with the fact that managers tend to manipulate information flow around actual share repurchases. For example, Brockman, Khurana, and Martin (2008) find that managers increase the frequency and magnitude of bad (good) news before (after) repurchasing shares. Because investors cannot observe firms' actual repurchase activity during a quarter (corporations publicly disclose their repurchase activity only after the end of a quarter), the stock outperformance following actual share repurchases could be related to this manipulation of information. In the next subsection we address this issue by examining announcements of share repurchases (events that firms cannot hide from investors) instead of actual share repurchases (events that firms can temporarily hide from investors).

5.2. *Other external financing decisions (from non-COMPUSTAT sources)*

In this subsection we expand the analysis of Section 5.1 to include other types of transactions that cannot be identified using Compustat data. We include private equity issues (following Hertzel, Lemmon, Linck, and Rees, 2002), private debt issues (Dichev and Piotroski, 1999), open-market share repurchases (Peyer and Vermaelen, 2005), and bank loans (Billet, Flannery, and Garfinkel, 2006).

The sample of private equity and debt issues comes from announcements reported in the Securities Data Corporation (SDC) Global New Issues Database. These samples exclude foreign issues, simultaneous international offerings, unit issues, and mortgages. The sample of open-market share repurchases comes from two sources. The main sample comes from announcements reported in SDC's US Mergers and Acquisitions database. As in Grullon and Michaely (2004), we supplement this sample with announcements of open-market share repurchase programs reported in the Wall Street Journal Index. Finally, we collect data on bank loans from the Loan Pricing Corporation—Reuter's DealScan database. We use the methodology in Chava and Roberts (2008) to match the bank loan sample to Compustat and CRSP. For each of these corporate events, we calculate monthly

Table 7
Stock performance after large corporate events.

This table reports monthly alphas (as percentages) and factor loadings for portfolios of firms in the top 10% of the distribution of equity issues, equity repurchases, debt issues, debt repurchases, net equity issues, net debt issues, dividend increases, and dividend decreases. We form portfolios by identifying at the end of June of each year, the firms in the top deciles of each of the corporate events and then we calculate monthly value-weighted returns over the next 12 months for each of the portfolios. We estimate time series monthly alphas using the following asset pricing models: the capital asset pricing model (CAPM) (portfolio return minus risk-free rate on *MKT*), the Fama and French model (portfolio return minus risk-free rate on *MKT*, *HML*, and *SMB*), and the *q*-factor model (portfolio return minus risk-free rate on *MKT*, *INV*, and *ROAF*). The risk-free rate is the monthly return on one-month US Treasury bills. *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate. *SMB* is the difference between the monthly return on a portfolio of small firms and the monthly return on a portfolio of large firms. *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks. *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms. *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low returns-on-assets firms. Data for the risk-free rate, *MKT*, *HML* and *SMB* are from Kenneth French. Data for *INV* and *ROAF* are from Long Chen. Robust standard errors are constructed following Hansen and Hodrick (1980). ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Equity issuers	Equity repurchasers	Debt issuers	Debt repurchasers	Net equity issuers	Net debt issuers	Dividend-increasing firms	Dividend-decreasing firms
Panel A: CAPM								
α^{CAPM}	−0.48***	0.172**	−0.318***	−0.029	−0.610***	−0.331***	0.034	0.221
	(0.167)	(0.083)	(0.122)	(0.126)	(0.168)	(0.099)	(0.095)	(0.134)
MKT	1.318***	0.988***	1.249***	1.177***	1.305***	1.221***	0.883***	0.954***
	(0.057)	(0.022)	(0.035)	(0.036)	(0.059)	(0.025)	(0.027)	(0.035)
Panel B: FF3								
α^{FF3}	−0.243*	0.291***	−0.325***	−0.096	−0.413***	−0.279***	0.083	0.068
	(0.141)	(0.074)	(0.124)	(0.123)	(0.136)	(0.092)	(0.092)	(0.132)
MKT	1.153***	0.955***	1.182***	1.141***	1.144***	1.131***	0.907***	0.983***
	(0.050)	(0.022)	(0.036)	(0.040)	(0.053)	(0.023)	(0.024)	(0.038)
HML	0.240***	−0.092***	0.298***	0.280***	0.299***	0.282***	−0.197***	0.171***
	(0.088)	(0.032)	(0.066)	(0.094)	(0.093)	(0.044)	(0.040)	(0.045)
SMB	−0.507***	−0.206***	−0.052	0.066	−0.443***	−0.163***	−0.050	0.255***
	(0.078)	(0.038)	(0.060)	(0.084)	(0.076)	(0.041)	(0.055)	(0.063)
Panel C: q-factor model								
α^{q}	0.025	0.196**	−0.176	−0.027	−0.118	−0.180	−0.113	0.174
	(0.143)	(0.089)	(0.129)	(0.138)	(0.146)	(0.114)	(0.076)	(0.134)
MKT	1.172***	0.980***	1.206***	1.173***	1.164***	1.176***	0.921***	0.970***
	(0.039)	(0.022)	(0.039)	(0.040)	(0.041)	(0.028)	(0.021)	(0.034)
INV	−0.557***	−0.091*	−0.304***	−0.196**	−0.507***	−0.254***	−0.124***	0.247***
	(0.107)	(0.055)	(0.072)	(0.081)	(0.101)	(0.073)	(0.048)	(0.084)
ROAF	−0.381***	0.007	−0.051	0.073**	−0.385***	−0.081**	0.221***	−0.038
	(0.055)	(0.030)	(0.032)	(0.037)	(0.061)	(0.041)	(0.026)	(0.059)

value-weighted returns over the next 12 months after the events, and then we estimate time series monthly alphas using the CAPM, FF3, and the *q*-factor model.

Table 8 contains the results of these tests. When we use the CAPM and FF3, we find evidence of underperformance after firms issue private equity or borrow money from banks and evidence of outperformance after firms repurchase equity in the open market. However, the evidence of abnormal performance is not robust to conditioning on investment-based factors (i.e., the *q*-factor model). The results indicate that the effect of investment on expected returns can explain the abnormal stock performance after these important corporate events.

6. Aggregate data

In the previous sections, our analysis is at the firm or event level. In this section we extend the analysis to the aggregate level. In the literature on predictive regressions, evidence shows that both aggregate investment and market timing variables are useful in predicting future variation in the equity premium. For example, Cochrane (1991) constructs a proxy for the investment to capital stock ratio and finds that it predicts market returns. Similarly, Baker and Wurgler (2000) construct the aggregate equity share in new issues (S) as described in Section 2 to test the market timing hypothesis and find strong support. We follow a similar approach. We construct a variety of aggregate financing measures and test whether these variables have power in predicting market returns when considered separately or jointly to our market timing proxy.

Our primary proxy for aggregate net financing is *Change in Net Financing*, which we construct from the Federal Reserve Flow of Funds data and define as follows.[4] *Net Financing* at time t is the net funds raised in markets (as opposed to internally) divided by total assets for nonfarm nonfinancial corporate business. These data come from Table F.102, line 38 and Table B.102, line 1,

[4] We also explore other proxies for net investment using the level of net financing. Other measures are *Financing Gap* defined as capital expenditures less the sum of US internal funds and inventory valuation adjustment (from Flow of Funds Table F.102, line 54) divided by total assets (from Table B.102, line 1), and *Investment to Capital Ratio*, the ratio of aggregate private nonresidential fixed investment to aggregate capital for the whole economy. *Investment to Capital Ratio* is constructed as in Cochrane (1991) and begins in 1948. The other variables begin in 1947.

Table 8
Stock performance after specialized corporate events.

This table reports monthly alphas (as percentages) and factor loadings for portfolios of firms involved in private equity issues, private debt issues, open-market share repurchases, and bank loans. We calculate monthly value-weighted returns over the next 12 months after the announcement of these specialized corporate events. We estimate time series monthly alphas using the following asset pricing models: the capital asset pricing model (CAPM) (portfolio return minus risk-free rate on *MKT*), the Fama and French model (portfolio return minus risk-free rate on *MKT*, *HML*, and *SMB*), and the *q*-factor model (portfolio return minus risk-free rate on *MKT*, *INV*, and *ROAF*). The risk-free rate is the monthly return on one-month US Treasury bills. *MKT* is the monthly return on the NYSE, Nasdaq, and Amex value-weighted index minus the risk-free rate. *SMB* is the difference between the monthly return on a portfolio of small firms and the monthly return on a portfolio of large firms. *HML* is the difference between the monthly return on a portfolio of high book-to-market stocks and the monthly return on a portfolio of low book-to-market stocks. *INV* is the difference between the monthly return on a portfolio of low investment-to-assets firms and the monthly return on a portfolio of high investment-to-assets firms. *ROAF* is the difference between the monthly return on a portfolio of high return-on-assets firms and the monthly return on a portfolio of low returns-on-assets firms. Data for the risk-free rate, *MKT*, *HML*, and *SMB* are from Kenneth French. Data for *INV* and *ROAF* are from Long Chen. Robust standard errors are constructed following Hansen and Hodrick (1980). ***, **, and * denote significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Private equity issuers	Private debt issuers	Open-market share repurchasers	Bank-loan borrowers
Panel A: CAPM				
α^{CAPM}	−1.061***	0.072	0.186*	−0.085
	(0.379)	(0.180)	(0.106)	(0.081)
MKT	1.371***	0.974***	0.945***	0.997***
	(0.071)	(0.060)	(0.028)	(0.027)
Panel B: FF3				
α^{FF3}	−1.052***	−0.044	0.178*	−0.136*
	(0.381)	(0.166)	(0.100)	(0.080)
MKT	1.271***	1.045***	0.979***	1.029***
	(0.078)	(0.040)	(0.024)	(0.029)
HML	0.627***	−0.073	−0.195***	−0.031
	(0.156)	(0.073)	(0.048)	(0.034)
SMB	−0.033	0.228**	0.025	0.112***
	(0.134)	(0.107)	(0.050)	(0.038)
Panel C: q-factor model				
α^{q}	−0.598	−0.164	0.070	−0.107
	(0.403)	(0.178)	(0.112)	(0.099)
MKT	1.208***	1.060***	0.987***	1.006***
	(0.071)	(0.044)	(0.027)	(0.032)
INV	−0.220	−0.002	−0.030	−0.125*
	(0.198)	(0.126)	(0.072)	(0.070)
ROAF	−0.400***	0.242***	0.123**	0.054*
	(0.103)	(0.068)	(0.053)	(0.029)

respectively. *Change in Net Financing* at year t is *Net Financing* at time t minus *Net Financing* at year $t-1$. We construct this variable from 1948 (the requisite *Net Financing* data from the Flow of Funds starts in 1947) through 2007. We focus on changes in net financing because of the strong serial persistence (near unit root) in the level of aggregate net financing. The market timing variable is the equity share in new issues. We use CRSP value weighted market returns as the dependent variable. We find similar results if we use CRSP equal-weighted market returns.

Table 9 presents means, standard deviations, and univariate correlations between the variables we examine in this analysis. The correlations between *Equity Share* and year-ahead market returns and between *Change in Net Financing* and year-ahead returns are negative (−0.17 and −0.33, respectively), and the correlation between *Equity Share* and *Change in Net Financing* is positive (0.19).

Our main tests are predictive regressions of year-ahead market returns, measured as the CRSP value-weighted return in excess of the Treasury bill rate, on aggregate *Equity Share*, aggregate *Change in Net Financing*, or both. We run annual regressions with Newey and West (1987) standard errors (four lags).[5] All regressors are standardized to have zero mean and unit variance.

Table 10 presents the results of our regressions. The sample period is for market returns from 1949 (or 1948 for some regressions) through 2008. Columns 1 and 2 are univariate regressions of excess year-ahead market returns regressed on *Equity Share* and *Change in Net Financing*, respectively. In Column 1, the sign on *Equity Share* is negative, but it is not statistically significant. In contrast, *Change in Net Financing* in Column 2 is significant at the 1% level.

The specification in Column 3 is analogous to our firm-level tests. Here we include both *Equity Share* and *Change in Net Financing* in the same regression. In this specification, the magnitude of the coefficient on *Equity Share* decreases from −3.02 (the estimate from Column 1) by about one third to −1.95. The coefficient on *Change in Net Financing* is essentially unchanged at −5.62 and remains statistically significant at the 1% confidence level. The test confirms results from our firm-level analysis: the amount of new financing is more important than the composition.

In Columns 4 through 6 we run the same test, but with alternate proxies for the level of new financing. In Column 4 we replace *Change in Net Financing* with *Net Financing*. As with our baseline result, the coefficient on *Equity Share* drops substantially—by about three-quarters—from its estimate in Column 1. The coefficient on *Net Financing* is not statistically significant in this regression. In Column 5 we use *Financing Gap* as our proxy for the level of new financing. This variable captures new external funds being raised to fund capital expenditures in aggregate, and its coefficient is statistically significant at the 10% level. *Equity Share* remains insignificant and noticeably smaller than in Column 1. In Column 6 we use *Investment to Capital Ratio,* as in Cochrane (1991), as our proxy for the level of new financing. The coefficient on this variable is statistically significant at the 5% level, but *Equity Share,* as in the other regressions, is statistically insignificant. We conclude that alternative proxies for the amount of new capital raised generally predict year-ahead market returns, but our proxy for the composition of that new capital (i.e., the *Equity Share*) does not.

[5] Although a small sample bias, as in Stambaugh (1999), theoretically could bias regression coefficients in a time series estimation like this one, the literature agrees that small sample bias in this setting is trivially small (Baker, Taliaferro, and Wurgler, 2006) and irrelevant (Butler, Grullon, and Weston, 2006a, 2006b). Our main variables, *Equity Share* and *Change in Net Financing*, are not highly persistent.

Table 9
Summary statistics: aggregate data.

This table reports the summary statistics for aggregate measures of stock returns, equity share, and several proxies for net financing. *Excess VW Return* is the Center for Research in Security Prices value-weighted return in excess of the Treasury bill rate. *Equity Share* is the ratio of aggregate new equity issues to total new issues (aggregate new equity and debt issues) as defined in Baker and Wurgler (2000). *Net Financing* is defined as net funds raised in markets divide by total assets for nonfarm nonfinancial corporate business. Net funds raised in markets are collected from the Federal Reserve Flow of Funds (Table F.102, line 38). Total assets are collected from the Federal Reserve Flow of Funds (Table B.102, line 1). Change in *Net Financing* is the change in net financing from $t-1$ to t. *Financing Gap* is equal to capital expenditures less the sum of US internal funds and inventory valuation adjustment (Table F.102, line 54) divided by total assets (Table B.102, line 1). *I/K* is the ratio of aggregate (private nonresidential fixed) investment to aggregate capital for the whole economy as defined in Cochrane (1991).

	Mean	Standard deviation	Correlation				
			Excess VW Return $(t+1)$	*Equity Share*	*Net Financing*	*Change in net Financing*	*Financing Gap*
Excess VW Return $(t+1)$	0.073	0.181	1				
Equity Share	0.191	0.083	−0.17	1			
Net Financing	1.410	0.852	−0.23	0.62	1		
Change in Net Financing	−0.030	0.665	−0.33	0.19	0.42	1	
Financing Gap	0.510	0.731	−0.22	0.28	0.41	0.02	1
I/K	0.036	0.003	−0.25	0.01	0.46	0.16	0.58

In Columns 7 and 8 we use the same regression specification as in our baseline test in Column 3 but different sample periods. In Column 7 we end our sample with market returns from 2007. The reasoning here is that 2008, the start of the financial crisis, could be an outlier year that has a large and nonrepresentative effect on our results. But this appears not to be the case. Our results ending our sample period at 2007 are qualitatively very similar to our baseline tests: *Equity Share* has no predictive power for year-ahead returns, but *Change in Net Financing* does.

Baker and Wurgler (2000) find support for *Equity Share* having predictive power even when controlling for proxies for level of investment (see their Table VII, p. 2242). But we do not find this in our tests. We explore this difference in Column 8 by ending our sample with market returns from 1997, the end of the sample period from Baker and Wurgler (2000). In this test we find that both *Equity Share* and *Change in Net Financing* are statistically significant, consistent with the original Baker and Wurgler (2000) result. We conclude that their original result could have been specific to the data sample period they had available at the time, because the result does not remain once later years are added to the sample. This conclusion is consistent with the findings in Butler, Grullon, and Weston (2005) and Goyal and Welch (2008) that indicate that the predictive power of the *Equity Share* is not robust.

7. Conclusion and discussion

If managers can successfully time the market through their financing decisions, then their choice of debt or equity should predict future stock returns. We call this a composition effect, because the debt-equity choice impacts the composition of net financing decisions. We draw the distinction that this effect is fundamentally different from a level effect of net financing. Firms that raise a large amount of capital should under-perform for a variety of reasons (exercise of real options, reduction in uncertainty about future growth, or a q-theory of investment). Thus, a firm's under-performance following its raising external capital is not necessarily evidence of market timing. The more informative test is whether the composition of capital raised (or distributed) affects future returns, conditional on the level of capital raised or distributed. We find that it does not.

We present a battery of tests of both the level and composition effects for firms over a 38-year period. In cross-sectional regressions of future excess returns on both the level of net financing and composition of net financing (the choice of debt or equity), we find that the level consistently is important but the composition consistently is not. Matched sample portfolio tests give the same results and interpretation, and the result survives numerous sample splits, different future return horizons, and alternative variable specifications. Although firms tend to raise capital when their stock market prices are high as they reflect better investment opportunities, it does not appear that managers can successfully substitute between debt and equity in anticipation of future returns.

We also find that the investment-based factor model of Chen, Novy-Marx, and Zhang (2010) can explain abnormal long-run performance following a variety of corporate events independently of the type of security involved in the event. We examine future stock returns following equity issues or repurchases, debt issues or repurchases, dividend increases or decreases, private equity or debt issues, open-market share repurchases, and bank loans. When we use the CAPM or FF3, we find abnormal long-run returns following most of these events, a result consistent with similar tests in the long-run performance literature. However, most of the evidence of abnormal performance does not survive conditioning on investment factors.

We conclude our empirical analysis by taking the idea behind our firm-level tests to the aggregate market level. We ask whether a variable capturing the aggregate level of financing crowds out a variable capturing the aggregate composition of financing. We find that changes in net financing provide greater explanatory power for future market returns than the equity share variable.

Table 10
Time Series regression of market returns on the equity share and proxies for net financing: aggregate data.

This table reports estimates of time series regressions of aggregate market returns on the aggregate equity share and proxies for aggregate net financing. *Excess VW Return* is the Center for Research in Security Prices value-weighted return in excess of the Treasury bill rate. *Equity Share* is the ratio of aggregate new equity issues to total new issues (aggregate new equity and debt issues) as defined in Baker and Wurgler (2000). *Net Financing* is defined as net funds raised in markets divide by total assets for nonfarm nonfinancial corporate business. Net funds raised in markets are collected from the Federal Reserve Flow of Funds (Table F.102, line 38). Total assets are collected from the Federal Reserve Flow of Funds (Table B.102, line 1). *Change in Net Finance* is the change in net financing from $t-1$ to t. *Financing Gap* is equal to capital expenditures less the sum of US internal funds and inventory valuation adjustment (Table F.102, line 54) divided by total assets (Table B.102, line 1). *I/K* is the ratio of aggregate (private nonresidential fixed) investment to aggregate capital for the whole economy as defined in Cochrane (1991). All the regressions below are annual ordinary least squares regressions with Newey and West (four lag) standard errors. Standard errors are reported in parentheses below coefficient estimates. *, **, and *** denote significantly different from zero at the 1%, 5%, and 10% level, respectively. Most of the data start in 1947 except for Cochrane's *I/K* measure, which starts one year later. In the regressions, all the right-hand-side variables are standardized to have zero mean and unit variance.

	Dependent variable: *Excess VW Return* at time $t+1$							
	Sample period, through 2008 (1)	Sample period, through 2008 (2)	Sample period, through 2008 (3)	Sample period, through 2008 (4)	Sample period, through 2008 (5)	Sample period, through 2008 (6)	Sample period, through 2007 (7)	Sample period, through 1997 (8)
Constant	7.33***	7.40***	7.35***	7.33***	9.66***	7.33***	8.11***	10.34***
	(2.11)	(2.15)	(2.20)	(2.08)	(2.01)	(1.98)	(2.07)	(1.97)
Equity Share$_t$	−3.02		−1.95	−0.71	−2.10	−2.96	−3.21	−4.90***
	(2.44)		(2.44)	(2.23)	(2.70)	(2.42)	(2.02)	(2.17)
Change in Net Financing		−5.99***	−5.62***				−4.71***	−4.64***
		(1.77)	(1.83)				(1.66)	(1.61)
Net Financing (level)				−3.76				
				(3.39)				
Financing Gap					−4.58*			
					(2.56)			
I/K						−4.60**		
						(2.19)		
Number of observations	62	61	61	62	62	61	60	50
Adj. R^2	0.012	0.093	0.088	0.023	0.028	0.059	0.098	0.168

Our paper shows that there is no long-run drift of stock returns resulting from an equity-heavy composition of net financing. The market incorporates any relevant information from the composition of net financing decisions quickly. Although it is reasonable to expect managers to attempt to time the market—according to the survey by Graham and Harvey (2001), many managers state that they do attempt to time their security issues—it is another thing to expect those managers to have precognition about future market movements. Barry, Mann, Mihov, and Rodriguez (2008, 2009) show that corporate managers react to recent market conditions in coming to their external financing decisions ("backward-looking timing" in their terminology) but have limited success in "forward-looking timing."

If market timing means that firms can take advantage of private information before it becomes public (e.g., asymmetric information), then our results do not challenge this view. However, if market timing means that firms can generate abnormal alphas after their financing decisions become publicly available (e.g., investors' underreaction), then our results challenge this view. Despite the asymmetric information between firms and the market, we find no evidence that firms fool investors through attempts to time the market.

References

Affleck-Graves, J., Miller, R.E., 2003. The information content of calls of debt: evidence from long-run stock returns. Journal of Financial Research 26 (4), 421–447.

Baker, M., Taliaferro, R., Wurgler, J., 2006. Predicting returns with managerial decision variables: is there a small sample bias? Journal of Finance 61 (4), 1711–1730.

Baker, M., Wurgler, J., 2000. The equity share in new issues and aggregate stock returns. Journal of Finance 55 (5), 2219–2257.

Baker, M., Wurgler, J., 2006. Investor sentiment and the cross section of stock returns. Journal of Finance 61 (4), 1645–1680.

Bakke, T.-E., Whited, T.M., 2010. Which firms follow the market? An analysis of corporate investment decisions. Review of Financial Studies 23 (5), 1941–1980.

Barry, C.B., Mann, S.C., Mihov, V., Rodriguez, M., 2008. Corporate debt issuance and the historical level of interest rates. Financial Management 37 (3), 413–430.

Barry, C.B., Mann, S.C., Mihov, V., Rodriguez, M., 2009. Interest rate changes and the timing of debt issues. Journal of Banking and Finance 33 (4), 600–608.

Berk, J.B., Green, R.C., Naik, V., 1999. Optimal investment, growth options, and security returns. Journal of Finance 54 (5), 1553–1607.

Billett, M.T., Flannery, M.J., Garfinkel, J.A., 2006. Are bank loans special? Evidence on the post-announcement performance of bank borrowers. Journal of Financial and Quantitative Analysis 41 (4), 733–751.

Boehme, R.D., Sorescu, S.M., 2002. The long-run performance following dividend initiations and resumptions: underreaction or product of chance? Journal of Finance 57 (2), 871–900.

Brockman, P., Khurana, I.K., Martin, X., 2008. Voluntary disclosures around share repurchases. Journal of Financial Economics 89 (1), 175–191.

Butler, A.W., Grullon, G., Weston, J.P., 2005. Can managers forecast aggregate market returns? Journal of Finance 60 (2), 963–986.

Butler, A.W., Grullon, G., Weston, J.P., 2006a. A Note on Nonsense Predictive Regressions Arising from Structural Breaks. Unpublished Working Paper. Rice University, Houston.

Butler, A.W., Grullon, G., Weston, J.P., 2006b. Can managers successfully time the maturity structure of their debt issues? Journal of Finance 61 (4), 1731–1758.

Carlson, M., Fisher, A., Giammarino, R., 2004. Corporate investment and asset price dynamics: implications for the cross-section of returns. Journal of Finance 59 (6), 2577–2603.

Chava, S., Roberts, M.R., 2008. How does financing impact investment? The role of debt covenants. Journal of Finance 63 (5), 2085–2121.

Chen, L., Novy-Marx, R., Zhang, L., 2010. An Alternative Three-factor Model. Unpublished Working Paper. Washington University in St. Louis, St. Louis.

Cochrane, J.H., 1991. Production-based asset pricing and the link between stock returns and economic fluctuations. Journal of Finance 46 (1), 209–237.

Cochrane, J.H., 1996. A cross-sectional test of an investment-based asset pricing model. Journal of Political Economy 104 (3), 572–621.

Cooper, M.J., Gulen, H., Schill, M.J., 2008. Asset growth and the cross-section of stock returns. Journal of Finance 63 (4), 1609–1651.

Daniel, K., Titman, S., 2006. Market reactions to tangible and intangible information. Journal of Finance 61 (4), 1605–1643.

Dichev, I.D., Piotroski, J.D., 1999. The performance of long-run stock returns following issues of public and private debt. Journal of Business Finance and Accounting 26 (9–10), 1103–1132.

Fama, E.F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33 (1), 3–56.

Fama, E.F., MacBeth, J.D., 1973. Risk, return and equilibrium: empirical tests. Journal of Political Economy 81 (3), 607–636.

Goyal, A., Welch, I., 2008. A comprehensive look at the empirical performance of equity premium prediction. Review of Financial Studies 21 (4), 1455–1508.

Graham, J.R., Harvey, C.R., 2001. The theory and practice of corporate finance: evidence from the field. Journal of Financial Economics 60 (2–3), 187–243.

Grullon, G., Michaely, R., 2004. The information content of share repurchase programs. Journal of Finance 59 (2), 651–680.

Hansen, L.P., Hodrick, R.J., 1980. Forward exchange rates as optimal predictors of future spot rates: an econometric analysis. Journal of Political Economy 88 (5), 829–853.

Hertzel, M., Lemmon, M., Linck, J.S., Rees, L., 2002. Long-run performance following private placements of equity. Journal of Finance 57 (6), 2595–2617.

Ikenberry, D., Lakonishok, J., Vermaelen, T., 1995. Market underreaction to open market share repurchases. Journal of Financial Economics 39 (2–3), 181–208.

Lee, I., Loughran, T., 1998. Performance following convertible bond issues. Journal of Corporate Finance 4 (2), 185–207.

Li, E.X.N., Livdan, D., Zhang, L., 2009. Anomalies. Review of Financial Studies 22 (11), 4301–4334.

Liu, L.X.L., Whited, T.M., Zhang, L., 2009. Investment-based expected stock returns. Journal of Political Economy 117 (6), 1105–1139.

Loughran, T., Ritter, J.R., 1995. The new issues puzzle. Journal of Finance 50 (1), 23–51.

Lyandres, E., Sun, L., Zhang, L., 2008. The new issues puzzle: testing the investment-based explanation. Review of Financial Studies 21 (6), 2825–2855.

Michaely, R., Thaler, R.H., Womack, K.L., 1995. Price reactions to dividend initiations and omissions: overreaction or drift? Journal of Finance 50 (2), 573–608.

Newey, W.K., West, K.D., 1987. A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. Econometrica 55 (3), 703–708.

Peyer, U.C., Vermaelen, T., 2005. The many facets of privately negotiated stock repurchases. Journal of Financial Economics 75 (2), 361–395.

Pontiff, J., Woodgate, A., 2006. Share issuance and cross-sectional returns. Journal of Finance 63 (2), 921–945.

Richardson, S.A., Sloan, R.G., 2003. External Financing and Future Stock Returns. Unpublished Working Paper. University of Pennsylvania, Philadelphia.

Ritter, J.R., 1991. The long-run performance of initial public offerings. Journal of Finance 46 (1), 3–27.

Schultz, P., 2003. Pseudo market timing and the long-run underperformance of IPOs. Journal of Finance 58 (2), 483–518.

Spiess, D.K., Affleck-Graves, J., 1995. Under-performance in long-run stock returns following seasoned equity offerings. Journal of Financial Economics 38 (3), 243–267.

Spiess, D.K., Affleck-Graves, J., 1999. The long-run performance of stock returns following debt offerings. Journal of Financial Economics 54 (1), 45–73.

Stambaugh, R.F., 1999. Predictive regressions. Journal of Financial Economics 54 (3), 375–421.

Xing, Y., 2008. Interpreting the value effect through the q-theory: an empirical investigation. Review of Financial Studies 21 (4), 1767–1795.

Zhang, L., 2005. The value premium. Journal of Finance 60 (1), 67–103.