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RETURNS FOR DIVIDEND-PAYING AND NON DIVIDEND PAYING FIRMS

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ABSTRACT

In this paper, we compare the equity returns of dividend-paying and non-dividend paying firms. We find no unconditional return difference even though non-dividend paying firms have many characteristics that suggest high risk. Equivalently, because non-dividend paying firms have high risk-metrics, their returns are abnormally low compared with dividend-paying firms. The reason for these anomalies is that a larger fraction of non-dividend paying firms are in financial distress and, despite high distress-risk and high growth-leverage, firms in financial distress have low returns from high volatility that decreases the options-leverage of equity. Removing firms in financial distress, returns for non-dividend paying firms increase relative to dividend-paying firms and abnormal returns disappear. We argue that part of the reason that firms in financial-distress have high volatility that leads to low returns is managerial risk-shifting that takes form as unexpectedly high capital expenditure rates.

JEL: G12, G32, G33, G35

KEYWORDS: Equity Returns, Dividends, Financial Distress, Volatility, Growth

INTRODUCTION

In perfect capital markets, Miller and Modigliani (1961) show the wealth of a firm's shareholders is invariant to corporate dividend policy. Across firms, returns for dividend-paying and non-dividend paying firms can differ if their corporate financial characteristics differ. The financial literature identifies several differences between dividend-paying and non-dividend paying firms. Pastor and Veronesi (2003) report that non-dividend paying firms have high profit volatility, high return volatility, and high market/book ratios. Fama and French (2001) find that non-dividend paying firms are smaller and less profitable but have better growth opportunities. Rubin and Smith (2009) characterize non-dividend paying firms as younger, smaller, and more levered. DeAngelo, DeAngelo and Stulz (2006) find that firms pay dividends when retained earnings are a large fraction of book-equity, which means that dividend-paying firms are more profitable. Fuller and Goldstein (2011) report that non-dividend paying firms have higher returns in advancing markets (and conversely), which means higher leverage. Blazenko and Fu (2010, 2013) find a positive value-premium for dividend-paying firms but a negative value-premium for non-dividend paying firms. Investors might reasonably conclude from these differences that non-dividend paying firms are riskier than dividend-paying firms.

However, Fuller and Goldstein (2011) report that dividend-paying firms have returns that exceed non-dividend paying firms. We find no statistical difference between the unconditional returns of dividend-paying and non-dividend paying firms but standard risk-metrics are higher for non-dividend paying firms and, thus, they have abnormally low returns compared with dividend-paying firms. We argue that standard risk-metrics overstate risk for non-dividend paying firms because they fail to capture relations between volatility, risk, and expected return. A larger fraction of non-dividend paying firms compared with dividend-paying firms are in financial distress (IFD) and IFD firms have low returns from high volatility that decreases the options-leverage of equity. Excluding firms in financial distress, returns for non-dividend paying firms increase relative to dividend-paying firms and abnormal returns disappear.

Our contribution to the literature on dividend-paying and non-dividend paying firms is to explain why returns on non-dividend paying firms are no greater than dividend paying firms despite high risk metrics. Section 2 reviews the literature on dividend and non-dividend paying firms and discusses our contribution to it. Section 3 presents preliminary results on returns of dividend-paying, non-dividend paying, and IFD firms. In section 4, we present evidence that high-profitability firms have high returns because of high growth-leverage despite high volatility and evidence that volatility accounts for low returns for IFD firms despite high growth-leverage. We attribute high volatility and high CAPX rates for IFD firms to managerial risk shifting. Finally in section 4, we report evidence that not in financial distress (NIFD) dividend-paying firms have positive alphas, NIFD non-dividend paying firms have zero alphas, and IFD firms have negative alphas. If the multifactor asset-pricing model we use for bench-marking represents the collective understanding of investors, we conclude that they do not recognize risk differences between dividend-paying, non-dividend paying, and IFD firms. The last section summarizes and concludes.

LITERATURE REVIEW

In the Black-Scholes (1976) economic environment, recognizing the likelihood of exercise, Galai and Masulis (1976) show that volatility increases expected payoff relative to the expected cost of option exercise, which decreases option-leverage and expected return. Thus, volatility and expected return relate negatively for a call option. The Black-Scholes option-pricing environment presumes constant volatility to maturity but volatility can change thereafter. Cross-sectionally, the Galai and Masulis (1976) result says that option returns are lower on stocks with high volatility. These results are true even though one can derive the Black and Scholes (1976) option-pricing formula with the simplifying assumption that risk-neutral investors populate the financial environment. Blazenko and Pavlov (2009) show that expected return and volatility relate negatively for a business with an indefinite sequence of growing growth options.

Empirically, Ang, Hodrick, Xing and Zhang (2006) find that firms with high idiosyncratic-volatility have negative abnormal returns. On the other hand, corporate leverage can induce a positive relation between returns and volatility. Poor profitability decreases share price, which increases financial leverage, volatility, and expected return. Christie (1982) presents evidence that supports this leverage induced relation between returns and volatility. Guided by the Galai and Masulis (1976) perspective that equity is a call option on the assets of a firm, we report evidence the negative impact of volatility on option-leverage is acute for IFD firms. We also find that growth-leverage increases returns. Continuing streams of growth capital expenditures (CAPX), which themselves grow, lever shareholder risk in the same way as fixed costs in operating-leverage (Brenner and Smidt, 1978, Blazenko and Pavlov, 2009). We refer to this relation between expected return and growth as "growth-leverage." Volatility or growth-leverage can dominate return determination. IFD firms have high volatility and low returns despite high growth-leverage. High-profitability firms with high growth leverage have high returns despite high volatility.

Katz, Lilien, and Nelson (1985), Dichev (1998), Griffin and Lemmon (2002), and Campbell, Hilscher and Szilagyi (2008) all observe that IFD firms have unexpectedly low returns. Garlappi and Yan (2011) argue that shareholder recovery in corporate reorganization decreases shareholder risk, which decreases expected return. We argue, with supporting evidence, that even though other risk types are high for IFD firms (like, growth-leverage), low returns arise from high volatility that decreases the options-leverage of equity.

In Blazenko and Pavlov's (2009) dynamic equity valuation model, managers maximize shareholder wealth by suspending business growth upon inadequate profit prospects. Consistent with this hypothesis, we find a positive relation between returns and CAPX rates within business classes for NIFD dividend-paying and non-dividend paying firms (not in financial distress) but not for IFD firms. Rather, IFD firms have high

CAPX rates and high growth-leverage even with modest profitability. We interpret this observation as evidence of managerial risk-shifting as businesses fall into financial distress from profit decline (Jensen and Meckling, 1976).

DATA AND METHODOLOGY

Our preliminary testing uses monthly returns for firms from the *CRSP* monthly file excluding exchange-traded funds (ETFs) and closed-end funds (CEFs). *CRSP* monthly-returns use the delisting-price for firms that delist in a calendar-month, which is generally the last traded share price. Delisting returns prevent a survivor bias. The *CRSP* monthly file covers NYSE firms from 12/31/1925, NYSE-AMEX-US firms from 7/31/1962 (AMEX before Oct 2008), NASDAQ firms from 12/29/1972, and NYSE-ARCA firms from 03/31/2006. With the addition of NASDAQ firms in 1972, there is an especially large increase in the number of firms from 2,667 at year-end 1972 to 5,382 at year-end 1973. This increase is important for return results we report in Table 1 because NASDAQ listing requirements are less strict than other exchanges and, thus, as Table 2 shows, NASDAQ firms are more likely in financial distress (IFD). To recognize this changing composition of businesses, Table 1 reports results not only for the period 12/31/1925–12/31/2011 but also for sub periods 12/31/1925–12/31/1972 and 12/31/1972–12/31/2011.

We classify a firm at the beginning of a month as dividend paying if *CRSP* assigns to it a monthly, quarterly, semi-annual, or annual dividend payment cycle and it has an ex-date in the immediately preceding period, respectively. We do not consider share repurchases as a dividend-substitute for several reasons. Grullon and Michaely (2002) and Grullon, Paye, Underwood and Weston (2011) find that most firms that repurchase shares also pay dividends but not conversely. Lee and Rui (2007) find that dividends depend on the permanent part of earnings whereas share repurchases depend on the temporary part. Even if a firm announces a share repurchase, they often leave it un-started or incomplete (Chung, Dusan, and Perignon, 2007) and, thus, it is difficult to identify when firms repurchase shares (other than after the fact in financial statements).

We classify a firm at the beginning of a month as IFD (in financial distress) if it has negative trailing twelve month (TTM) earnings, which we calculate from the *COMPUSTAT* quarterly file for active and inactive companies to prevent a survivor bias. A firm can have a bad reporting quarter without this classification, which results only from continued poor profitability. Katz, Lilien, and Nelson (1985), Dichev (1998), and Griffin and Lemmon (2002) use Z-scores and O-scores (Altman 1968, Ohlson, 1980) and Garlappi and Yan (2011) use Moody's *Expected Default Frequency*™ to predict bankruptcy. Unlike these measures, negative TTM earnings is not subject to estimation risk because it is our definition of financial-distress rather than a statistical measure to predict a future event. Nonetheless, a primary determinant of O-scores, Z-scores, and Moody's *EDF* is profitability. As a financial-health measure, TTM earnings is easy to calculate and commonly reported so any investor can use it for investment strategies. Results in Tables 1 and 3 show the ability of TTM earnings to discriminate returns between IFD and NIFD firms (not in financial distress). In addition, we report evidence in Section 4 that managers of IFD firms undertake more risky growth investments than expected.

<u>Preliminary Return Observations</u>

Without identifying firms in financial distress, Panel A of Table 1 reports average returns and equation (1) parameter estimates with monthly returns for an equally-weighted portfolio of non-dividend paying (ND) versus an equally weighted portfolio of dividend-paying firms (D) for the entire time series and sub periods,

$$r_{EWP_{1,t}} = \alpha + \beta \cdot r_{EWP_{2,t}} + \varepsilon_t \quad (1)$$

We rebalance portfolios with our "dividend paying" definition is at the beginning of each month. The average number of firms in the ND and D portfolios is 1,997 and 1,393, respectively. Equal-weighting better represents the return characteristics of an entire business class (like, dividend paying or non-dividend paying) than does value-weighting that reflects the return characteristics of a few large firms.

When tested against a unity null-hypothesis, the slope, β, in equation (1) measures risk of non-dividend paying firms *relative* to dividend-paying firms, which is β-times greater for $\beta > 1$. Portfolio 2 returns determines portfolio 1 returns (plus an error) and portfolio 1 excess-return is β times that of portfolio 2 even if multiple factors determine both returns in the first instance. Thus, we do not assume a single factor return generating model. The appendix proves these assertions. When tested against a null-hypothesis of zero, the α intercept identifies abnormal returns unexplained by risk differences between non-dividend paying and dividend-paying firms.

Table 1: Monthly Returns for Dividend Paying, Non-Dividend Paying, and in Financial Distress Firms

Panel A: Non-Dividend Paying Firms Versus Dividend Paying Firms					
	12/31/1925-12/31/2011	12/31/1925-12/31/1972	12/31/1972-12/31/2011	Sub-Period α Difference	Sub-Period β Difference
Average Return for Non-Dividend Paying Firms	0.0128	0.0136	0.0119		
Average Return for Dividend Paying Firms	0.0116	0.0106	0.0128		
Return Difference	0.001	0.003	-0.001		
	(0.81)	(1.39)	(-0.50)		
α	-0.0045	-0.0032	-0.0049	0.0017	0.283
	(-3.61)	(-2.13)	(-2.36)	(0.65)	(3.09)
β	1.49	1.59	1.31		
(H_0: β=1)	(8.10)	(7.18)	(7.56)		
R^2	0.80	0.85	0.70		

Panel B: NIFD Non-Dividend Paying, NIFD Dividend Paying, IFD Firms (12/31/1972-12/31/2011)			
	ND:NIFD vs. D:NIFD	IFD vs. D:NIFD	IFD vs. ND:NIFD
Return Difference	0.0024	-0.0042	-0.0066
	(1.62)	(-1.47)	(-3.78)
α	-0.0018	-0.0092	-0.0091
	(-1.21)	(-3.20)	(-5.49)
β	1.33	1.39	1.17
(H_0: β=1)	(9.41)	(5.10)	(3.97)
R^2	0.82	0.55	0.83

In parentheses are t-stats that are Newey and West (1987) adjusted for regressions. Without identifying firms in financial distress, Panel A reports parameter estimates in the regression of monthly returns for an equally weighted portfolio of non-dividend paying firms (ND) versus a portfolio of dividend-paying firms (D) (excluding ETFs and CEFs). In Panel B, firms have data from both CRSP and COMPUSTAT. The acronyms IFD and NIFD stand for "in financial distress" and "not in financial distress." A firm is IFD if it has negative TTM earnings. There are three portfolios in Panel B (all equally weighted): firms that are NIFD and pay dividends (D:NIFD), firms that are NIFD and do not pay dividends (ND:NIFD), and IFD firms regardless of whether they pay dividends or not. The average number of firms in the D:NIFD, ND:NIFD, and IFD portfolios is 1,598, 1,469, and 1,178.

In Panel A of Table 1, over the 12/31/1925–12/31/2011 period, average monthly returns for non-dividend paying firms exceed those of dividend paying firms but the difference is statistically insignificant. This result identifies no risk difference between non-dividend paying and dividend-paying firms. In the regression of portfolio returns for non-dividend paying versus dividend-paying firms, the slope coefficient, β, statistically exceeds unity, $\hat{\beta}$=1.49, which suggests greater risk for non-dividend paying firms. Since there is no difference in raw-returns but non-dividend paying firms have greater risk, the returns of dividend-paying firms are abnormally high compared with non-dividend paying firms. The alpha estimate is negative and statistically significant, $\hat{\alpha} = -0.0045$. Sub period results in Panel A are similar to the entire sample. Raw return differences between dividend-paying and non-dividend paying firms are insignificant, the β-risk of non-dividend paying firms exceeds that of dividend-paying firms, and returns for dividend-paying firms are abnormally greater than non-dividend paying firms.

Panel B of Table 1 reports average monthly return differences and parameter estimates for equation (1) in the regression of equally-weighted portfolio returns for one business class versus another. The three business classes are: NIFD non-dividend paying (ND:NIFD), NIFD dividend-paying (D:NIFD), and IFD firms (regardless of whether they pay dividends or not). We do not distinguish the dividend decisions of IFD firms because they face more serious financial issues than dividend pay-out and Table 2 shows that only a small fraction of IFD firms pay dividends (9%).

Removing IFD firms, returns for non-dividend paying firms increase relative to dividend-paying firms in Panel B of Table 1 compared with Panel A. In the first row, the return difference between ND:NIFD and D:NIFD is positive and statistically significant at roughly the 10% level (return difference is 0.0024 and the t-stat is 1.62). In addition, abnormal returns disappear. Higher risk for ND:NIFD firms relative to D:NIFD firms ($\hat{\beta}$=1.33) accounts for the raw-return difference. The alpha estimate is insignificant ($\hat{\alpha}=-0.0018$ and the t-stat is -1.21).

In the final two rows of Panel B, high β-risk for IFD firms relative to D:NIFD firms ($\hat{\beta}$=1.39) and IFD firms relative to ND:NIFD firms ($\hat{\beta}$=1.17) does not accord with low returns for IFD firms. Abnormal returns are negative and statistically significant in both cases ($\hat{\alpha} = -0.0092$ and $\hat{\alpha} = -0.0091$, respectively). Beginning in the following section, guided by the Galai and Masulis (1976) view that equity is a call option on the assets of a firm, we investigate the hypothesis that returns decrease with volatility and that this relation accounts for low returns for IFD firms. In addition, we present evidence that high-profitability firms have high returns from high growth-leverage despite high volatility.

Table 2: Firms in Financial Distress, NASDAQ, and Dividend-Paying Firms

	Fraction of Firms That Are IFD	Fraction of Firms That Are NASDAQ	Fraction of Firms That Are Dividend-Paying
Panel a: *CRSP* (12/31/1972–12/31/2011)			
Non-Dividend Paying		68%	
Dividend-Paying		35%	
All Firms		55%	39%
Panel B: CRSP & COMPUSTAT (12/31/1972–12/31/2011)			
Non-Dividend Paying	42%	70%	
Dividend-Paying	6%	33%	
NASDAQ	36%		24%
Non-NASDAQ	18%		60%
IFD Firms		72%	9%
NIFD Firms		49%	52%
All Firms	28%	55%	40%
Panel C: CRSP, COMPUSTAT & I/B/E/S (1/15/1976–1/19/2012)			
Non-Dividend Paying	35%	69%	
Dividend-Paying	6%	29%	
NASDAQ	30%		27%
Non-NASDAQ	13%		66%
IFD Firms		69%	12%
NIFD Firms		45%	55%
All Firms	21%	50%	46%

Acronyms IFD and NIFD stand for "in financial distress" and "not in financial distress." IFD firms have negative trailing twelve month earnings.

Portfolio Analysis

In Blazenko and Pavlov's (2009) dynamic equity-valuation model, expected return decreases with volatility and increases with business growth. Since profitability underlies volatility and growth, we form portfolios with profitability and then explore relations between returns, volatility and growth-leverage. Corporate growth depends on profitability for several reasons. First, since earnings have high persistence (Fama and French, 2006), high earnings occur with good growth prospects that managers exploit with expansion investments. Second, with financing constraints (Froot, Scharfstein and Stein, 1993), managers finance growth largely internally and only when profitability allows. We require firms have data from each of the *COMPUSTAT*, *CRSP*, and *I/B/E/S* databases. *CRSP* is our source for share price and other stock market data. Forward annual *ROE* is our measure of business profitability using *I/B/E/S* consensus analysts' annual earnings forecasts for the next unreported fiscal year as forward earnings. In an investigation of analysts' forecasts (not reported), we find that analysts accurately forecast the upcoming unreported fiscal-year but they over-forecast more distant unreported fiscal years. Forward *ROE* is forward earnings divided by book equity from the most recent quarterly report prior to portfolio formation. Book equity is Total Assets less Total Liabilities less Preferred Stock plus Deferred Taxes plus Investment Tax Credits from the *COMPUSTAT* quarterly file. We exclude firms with negative book equity. We use annual rather than quarterly earnings to avoid profit seasonality. We use TTM earnings as our financial-distress measure but forecast earnings to form portfolios because forecast earnings better represent investors' information when they form and rebalance portfolios. Forecast earnings also allow us a more refined investigation of financial-distress than is possible with only historical earnings. For example, if a firm has negative TTM earnings but positive forecast earnings, then investors expect the duration of financial distress to be short. If a firm has positive TTM earnings but negative forecast earnings, then, analysts expect imminent financial-distress.

I/B/E/S reports a time series snapshot of analysts' earnings per share (*EPS*) forecasts on "Statistical Period" dates (the Thursday preceding the third Friday of the month). We rebalance portfolios at the close of trading on Statistical Period dates so that the data we use for testing is timely and matches the information available to investors. The first *I/B/E/S* Statistical Period date is 1/15/1976 and the last for our study is 1/19/2012. This period has 433 Statistical Period dates and 432 "Statistical Period months" (intervals between Statistical Period dates). For Statistical Period dates before 7/20/1978 there are fewer than 20 IFD firms and, thus, for IFD firms in Panel C of Table 3 we begin our analysis thereafter. This period has 403 Statistical Period dates and 402 Statistical Period months. At Statistical Period dates from the 1'st to the 432'd, we assign each firm with positive *BVE* and data from *COMPUSTAT*, *CRSP*, and *I/B/E/S* into one of three business classes: IFD, D:NIFD, or ND:NIFD. Within each business class, we sort firms with forward *ROE* into twenty portfolios with roughly an equal number of firms in each portfolio ($3 \times 20 = 60$ portfolios). From low to high forward *ROE*, portfolios *b*=1,2,…,20 are D:NIFD, portfolios *b*=21,…,40 are ND:NIFD, and portfolios *b*=41,…,60 are IFD. The average numbers of firms in these portfolios are 63, 51, and 33 for D:NIFD, ND:NIFD, and IFD firms, respectively. Our sample has 3,750,840 firm-month observations in total. Panels A, B, and C of Table 3 report median forward *ROE*s for firms in each of these portfolios.

<u>Portfolio Returns</u>

Because Statistical Period dates are midmonth, we cannot use *CRSP* monthly returns that use month-ends. Instead, monthly return for firm *i* sorted into portfolio *b*, for Statistical Period month *t* (from Statistical Period *t* to Statistical Period *t+1*), is,

$$R_{i,b,t} = \left(\frac{P_{i,t+1} + D_{i,t} - P_{i,t}}{P_{i,t}}\right) \tag{2}$$

where $P_{i,t}$ and $P_{i,t+1}$ are split-adjusted closing share prices for firm *i* on Statistical Period date *t* and *t+1* and $D_{i,t}$ is the split-adjusted dividend (or distribution) per share with ex-date between Statistical Period dates. For $P_{i,t+1}$ we use the *CRSP* delisting price or last trading price in the statistical period month. We use the first opening or closing price available from *CRSP* in Statistical Period month *t* if the share price $P_{i,t}$ is missing. Denote $N_{b,t}$ as the number of firms in portfolio *b* at Statistical Period date *t*. The equally weighted return on portfolio *b* that we rebalance at each Statistical Period date *t*=1,2,…,432 is the average of the monthly return on portfolio *b* at time *t*,

$$\bar{R}_b \equiv \sum_{t=1}^{T} \left(\sum_{i=1}^{N_{b,t}} R_{i,b,t} / N_{b,t} \right) / T = \sum_{t=1}^{T} \bar{R}_{b,t} / T \tag{3}$$

We form portfolios on Statistical Period dates with historical profitability (that is, IFD or not) and within business classes with forward *ROE*. Investors can reproduce our results because only in the month after portfolio formation do we measure returns. Table 3 reports monthly equally-weighted returns over our test period, *t*=1,2,…,432, for portfolios of D:NIFD, ND:NIFD, and IFD firms.

Additional Portfolio Measures

We measure portfolio *b* volatility as the average over firms of daily return standard deviation for the number of trading days, κ, in the 365 calendar days before statistical period *t*,

$$\hat{\sigma}_{b,t} \equiv \sum_{i=1}^{N_{b,t}} \frac{\sigma_{i,t}}{N_{b,t}} \tag{4}$$

where $\bar{R}_i = \sum_{\tau=-1}^{-\kappa} R_{i,\tau}/\kappa$ and $\sigma_{i,t} = \sqrt{\sum_{\tau=-1}^{-\kappa}\left(R_{i,\tau} - \bar{R}_i\right)^2/(\kappa - 1)}$. Table 3 reports median portfolio volatility, $\overline{\hat{\sigma}_b} = \underset{t=1,T}{median}\left(\hat{\sigma}_{b,t}\right)$, for each portfolio *b*=1,2,…,60. Equation (4) measures the average volatility of a firm in a portfolio rather than the volatility of the portfolio itself. We use this measure for individual equity risk rather than the risk of a portfolio that an equity is in. We measure corporate growth with annual capital expenditure (CAPX) relative to net fixed assets (NFA) from the most recent year-end financial report before a statistical period date. We use CAPX as a growth measure because it requires a purposeful decision by managers. Alternatives, like, asset growth, depend on current-asset changes that depend on revenue changes that are subject to uncertainties not immediately related to managerial decisions. Average portfolio skewness is the temporal average of cross-sectional return skewness over firms in a portfolio at a particular month. Average market-capitalization is the temporal average of the cross-sectional average for firms in the portfolio at a particular month. Leverage is the temporal average of the cross-sectional average of total book liabilities before *t* from the COMPUSTAT quarterly file divided by market capitalization for firm *i*.

Median forward ROE is $\underset{t=1,T}{median}\left(\underset{i=1,N}{median}\, ROE_{i,b,t}\right)$ and the median TTM ROE is $\underset{t=1,T}{median}\left(\underset{i=1,N}{median}\, TTM\ ROE_{i,b,t}\right)$. B/M is the median Book to Market ratio. Market-beta is the slope in the regression of the portfolio excess return on the CRSP value-weight excess return over the entire time series. The riskless rate is the one month T-Bill rate.

Summary Statistics across Business Classes

We begin our discussion of portfolio summary measures in Table 3 across panels that represent the three business classes we study: ND:NIFD, D:NIFD, and IFD. We base this discussion on average summary measures at the bottom of each panel. IFD firms have the lowest monthly return, while ND:NIFD and D:NIFD firms have about equal monthly returns. Return skewness is about the same for D:NIFD and ND:NIFD firms and highest for IFD firms. Financial leverage increases from D:NIFD to ND:NIFD to IFD firms. Market capitalization decreases from D:NIFD to ND:NIFD to IFD firms. CAPX rates are the lowest for D:NIFD firms and highest for ND:NIFD and IFD firms. CAPX rates are high in each panel of Table 3 because businesses make capital expenditures both to maintain existing assets (maintenance CAPX) and to grow (growth CAPX). We do not distinguish between these CAPX types because we expect both to increase shareholder risk and return and, thus, we want both in our analysis.

Profitability, measured by either TTM ROE or forward ROE, is about the same for D:NIFD and ND:NIFD firms and lowest for IFD firms. Book/market is lowest for ND:NIFD, then D:NIFD, and highest for IFD firms. Market-β is lowest for D:NIFD firms (below unity), higher ND:NIFD firms (above unity), and, highest for IFD firms (even higher above unity). Return volatility is lowest for D:NIFD firms, higher for ND:NIFD firms, and highest for IFD firms. Portfolio return-skewness is positive and greatest for IFD firms in Panel C compared with D:NIFD and ND:NIFD firms in Panels A and B, respectively. Our interpretation of this observation is that investors accept low average monthly returns for IFD firms because they might own a common-share that emerges from financial distress with a large payoff as compensation for bearing the risk the common-share never leaves the financial-distress state. The Galai and Masulis (1976) hypothesis is consistent with investor skewness-preference.

<u>Summary Statistics within Business Classes</u>

A review of TTM *ROE* and forward *ROE* in Table 3 suggests that investors expect businesses in extreme financial distress to remain in financial distress. IFD firms in Panel C with the lowest TTM *ROE* have negative forward *ROE*. Among IFD firms, investors expect improving financial health from businesses in least financial distress. IFD firms with highest TTM *ROE* have positive forward *ROE*. Panel B indicates that investors expect the profitability of the least profitable ND:NIFD firms to worsen. ND:NIFD firms with lowest TTM *ROE* have lower forward *ROE*. Investors expect the profitability of the most profitable ND:NIFD firms to improve. ND:NIFD firms with highest TTM *ROE* have higher forward *ROE*. Panel A shows that investors expect no change in the profitability of D:NIFD firms. Regardless of whether TTM *ROE* is high or low, forward *ROE* is about the same.

In Panels A and B of Table 3, CAPX increases with forward *ROE* for D:NIFD and ND:NIFD firms, (that is, portfolios b=1 to b=20 and b=21 to b=40). This observation is consistent with the hypothesis that managers use profitability to fund business investment because of financing constraints or the Blazenko and Pavlov (2009) hypothesis that managers suspend expansion when profit prospects are poor. However, this relation does not hold for IFD firms. In Panel C, CAPX is unrelated or even decreasing with forward *ROE* (portfolio b=41 to b=60).

NIFD firms with low forward *ROE* at the top of Table 3 Panels A and B have CAPX rates greater than zero even with book/market above unity. Growth with book/market above unity is inconsistent with both Tobin (1969) and Blazenko and Pavlov (2009). On the other hand, Blazenko and Pavlov (2010) argue that managers grow a business with *innovative* investments that have "shadow options" for unanticipated growth opportunities even with book/market above unity. In panel C, IFD firms have book/market less than unity, high CAPX rates, and low profitability. We argue that high CAPX rates despite low profitability arises from managerial risk-shifting for firms in financial distress.

In each panel of Table 3, the relation between return-volatility and forward *ROE* is U-shaped. We interpret this observation to mean that at low profitability, profitability decreases the likelihood of financial distress, which decreases volatility. High profitability induces high return-volatility from high CAPX rates that create high growth-leverage. Profitability has offsetting forces that decreases return-volatility at low profitability and increases return-volatility at high profitability. For each of the three business classes in Table 3, average realized monthly return increases with forward *ROE* (portfolio b=1 to b=20, b=21 to b=40, and b=41 to b=60). For ND:NIFD and D:NIFD firms in Panels A and B, we interpret these results to be from growth leverage from high CAPX rates within business classes. A similar interpretation is not appropriate for IFD firms since the least profitable IFD firms have the greatest CAPX rates (portfolios b=41 and b=42). We argue that this phenomenon is consistent with managerial risk shifting.

Table 3: Summary Statistics

Portfolio	Monthly Return	Skewness	Leverage	Size	CAPX	TTM ROE	Forward ROE	B/M	Beta	Portfolio Volatility
Panel A: Dividend Paying Firms NIFD (1/15/1976-1/19/2012)										
b=1	0.0102	0.3120	21.57	1,124	0.191	0.045	0.030	1.40	1.03	0.0213
b=2	0.0114	0.4242	4.92	1,430	0.178	0.056	0.055	1.19	0.94	0.0192
b=3	0.0117	0.4798	3.43	1,492	0.167	0.067	0.068	1.09	0.87	0.0180
b=4	0.0119	0.4540	3.25	1,823	0.162	0.076	0.078	1.02	0.85	0.0175
b=5	0.0130	0.3525	3.19	2,037	0.168	0.083	0.086	0.97	0.84	0.0172
b=6	0.0117	0.4164	3.48	2,179	0.172	0.091	0.093	0.91	0.84	0.0175
b=7	0.0131	0.4051	3.51	2,181	0.176	0.097	0.101	0.85	0.86	0.0177
b=8	0.0125	0.4696	3.42	2,379	0.185	0.104	0.109	0.79	0.88	0.0179
b=9	0.0136	0.3933	3.42	2,421	0.193	0.111	0.116	0.75	0.88	0.0183
b=10	0.0132	0.4716	3.45	2,711	0.201	0.118	0.124	0.70	0.92	0.0182
b=11	0.0132	0.4741	3.63	3,179	0.207	0.125	0.132	0.66	0.95	0.0179
b=12	0.0137	0.3970	3.44	3,132	0.215	0.132	0.139	0.62	0.95	0.0182
b=13	0.0138	0.4010	3.34	3,063	0.225	0.139	0.148	0.58	0.99	0.0180
b=14	0.0142	0.4054	2.96	3,607	0.225	0.147	0.157	0.53	0.99	0.0184
b=15	0.0136	0.3708	2.51	4,444	0.232	0.157	0.167	0.49	0.99	0.0183
b=16	0.0143	0.3561	2.05	5,170	0.234	0.165	0.179	0.43	1.05	0.0188
b=17	0.0140	0.3267	1.62	7,177	0.240	0.179	0.194	0.39	1.05	0.0190
b=18	0.0134	0.3351	1.20	7,612	0.247	0.199	0.216	0.33	1.10	0.0192
b=19	0.0138	0.3071	0.99	9,012	0.266	0.231	0.253	0.27	1.12	0.0202
b=20	0.0144	0.3770	0.70	9,993	0.274	0.325	0.364	0.17	1.09	0.0103
Average	0.0130	0.3964	3.80	3,808	0.208	0.132	0.140	0.71	0.96	0.0186
Panel B: Non-Dividend Paying Firms (1/15/1976-1/19/2012)										
b=21	0.0079	0.5579	68.69	423	0.296	0.049	0.000	1.33	1.33	0.0330
b=22	0.0083	0.4257	16.44	515	0.268	0.041	0.024	1.32	1.29	0.0312
b=23	0.0111	0.5110	2.97	579	0.281	0.045	0.044	1.03	1.25	0.0326
b=24	0.0124	0.4175	2.33	575	0.290	0.054	0.059	0.94	1.27	0.0317
b=25	0.0115	0.3832	1.96	562	0.297	0.063	0.072	0.85	1.26	0.0324
b=26	0.0101	0.4133	1.92	615	0.304	0.075	0.083	0.79	1.25	0.0319
b=27	0.0109	0.3343	1.56	613	0.312	0.082	0.094	0.73	1.27	0.0318
b=28	0.0108	0.3088	1.48	627	0.317	0.090	0.105	0.67	1.27	0.0311
b=29	0.0105	0.3177	1.36	636	0.318	0.100	0.115	0.60	1.27	0.0309
b=30	0.0134	0.4206	1.25	691	0.322	0.108	0.125	0.57	1.31	0.0310
b=31	0.0118	0.3038	1.17	748	0.335	0.117	0.135	0.53	1.31	0.0305
b=32	0.0122	0.3245	1.08	844	0.342	0.126	0.146	0.48	1.34	0.0308
b=33	0.0124	0.2636	1.00	900	0.350	0.134	0.157	0.45	1.34	0.0307
b=34	0.0159	0.3385	0.80	992	0.383	0.144	0.169	0.40	1.38	0.0302
b=35	0.0129	0.3386	0.71	1,250	0.370	0.157	0.184	0.38	1.38	0.0307
b=36	0.0152	0.2715	0.71	1,412	0.371	0.172	0.201	0.34	1.38	0.0308
b=37	0.0141	0.3037	0.62	1,769	0.385	0.188	0.223	0.30	1.38	0.0311
b=38	0.0152	0.3581	0.58	1,784	0.386	0.212	0.254	0.26	1.44	0.0314
b=39	0.0163	0.3599	0.54	2,287	0.416	0.256	0.309	0.21	1.44	0.0322
b=40	0.0184	0.5632	0.72	1,961	0.387	0.387	0.493	0.12	1.51	0.0338
Average	0.0126	0.3758	5.39	989	0.337	0.130	0.150	0.61	1.33	0.0315
Panel C: IFD Firms (7/20/1978-1/19/2012)										
b=41	0.0031	0.7280	5.85	212	0.483	-1.932	-1.673	0.17	1.73	0.0518
b=42	0.0083	0.7535	5.31	197	0.659	-0.750	-0.694	0.35	1.65	0.0483
b=43	0.0047	0.6946	3.71	205	0.364	-0.490	-0.457	0.44	1.55	0.0451
b=44	0.0055	0.6700	3.76	235	0.362	-0.360	-0.322	0.55	1.61	0.0437
b=45	0.0042	0.6198	4.04	288	0.356	-0.288	-0.229	0.64	1.67	0.0432
b=46	0.0093	0.7159	4.05	299	0.338	-0.216	-0.152	0.76	1.55	0.0408
b=47	0.0092	0.6270	3.93	339	0.318	-0.157	-0.103	0.84	1.58	0.0394
b=48	0.0085	0.5030	4.20	351	0.314	-0.135	-0.067	0.89	1.34	0.0393
b=49	0.0029	0.5921	4.28	408	0.370	-0.106	-0.038	0.96	1.42	0.0367
b=50	0.0084	0.5360	5.43	435	0.361	-0.088	-0.017	1.00	1.44	0.0360
b=51	0.0063	0.5943	6.91	488	0.360	-0.072	0.000	1.02	1.46	0.0347
b=52	0.0056	0.4933	15.39	530	0.272	-0.066	0.010	1.05	1.45	0.0334
b=53	0.0055	0.4900	11.74	548	0.271	-0.059	0.024	1.04	1.32	0.0335
b=54	0.0107	0.4212	13.66	596	0.268	-0.062	0.037	0.99	1.39	0.0333
b=55	0.0092	0.4738	8.66	698	0.274	-0.062	0.049	0.89	1.39	0.0336
b=56	0.0085	0.4320	3.21	890	0.277	-0.069	0.062	0.83	1.32	0.0339
b=57	0.0105	0.5279	3.17	994	0.280	-0.072	0.079	0.74	1.37	0.0344
b=58	0.0111	0.3712	3.01	1,006	0.299	-0.083	0.102	0.62	1.43	0.0343
b=59	0.0109	0.4682	3.06	1,011	0.315	-0.109	0.145	0.48	1.44	0.0364
b=60	0.0099	0.6478	2.19	1,046	0.336	-0.276	0.285	0.25	1.48	0.0406
Average	0.0076	0.5680	5.78	539	0.344	-0.273	-0.148	0.73	1.48	0.0386

Monthly return is equally weighted over firms in each portfolio. Skewness is over firms in a portfolio and then averaged over the time-series. Size is average market capitalization. Leverage is the average of book value of total liabilities divided by market value of equity. CAPX is the average of capital expenditures per annum divided by net fixed assets. TTM ROE and forward ROE are both medians. Beta is the slope coefficient in the regression of portfolio excess return on the CRSP value weighted excess return over the entire time series. The riskless rate is from a one-month T-bill. Volatility for a portfolio is a time-series median of the average return standard-deviation for firms in a portfolio.

At low forward *ROE*, D:NIFD firms in Table 3 have returns that exceed ND:NIFD firms and vice versa for high forward *ROE*. In the following sub-section, we investigate whether these return differences are normal (explained by risk differences) or abnormal.

EMPIRICAL RESULTS

Our Table 3 observations in the last section suggest a risk dispersion across and within business classes. The annual return spread between portfolios of high and low profitability firms is 12.6% for ND:NIFD firms (not in financial distress non-dividend paying), 5.04% for D:NIFD firms (not in financial distress dividend-paying) and 8.16% for IFD firms (in financial distress). Across the panels of Table 3, average monthly returns are 1.30% (highest) for D:NIFD firms and 0.76% (lowest) for IFD firms, which is an annual return spread of 12*(0.0130-0.0076)=6.48%. The annual return spread between highest profitability ND:NIFD firms (*b*=40) and least profitable IFD firms (*b*=41) is 12*(0.0184-0.0031)=18.36%. We conclude from these large spreads that firms are not of uniform risk either within or across business classes. In sections that follow, we study the economic risk determinants of these return spreads.

Fama-MacBeth Regressions of Portfolio Returns versus Volatility and CAPX Rates

In the Galai and Masulis (1976) perspective that equity is a call option on the assets of a firm, returns decrease with volatility. In Blazenko and Pavlov (2009), expected return for a business with an indefinite sequence of growing growth options decreases with volatility and increases with growth. A review of Table 3 shows that volatility and CAPX rates increase with each other. Regression in the current section separates the impact of growth and volatility on returns. To test for these impacts, we create four variables each for volatility and growth. The first volatility variable (similarly for growth) measures the impact of volatility on returns across business classes and the second, third, and fourth measure the differential impact of volatility on returns within each business class.

We measure return volatility for business class J=ND:NIFD, J=D:NIFD, and J=IFD as the average over firms of daily return standard deviations for the number of trading days, κ, in the 365 calendar days before statistical period t,

$$\sigma_{J,t} = \sum_{i=1}^{N_{J,t}} \frac{\sigma_{i,t}}{N_{J,t}} \quad (5)$$

where $\bar{R}_i = \sum_{\tau=-1}^{-\kappa} R_{i,\tau}/\kappa$, $\sigma_{i,t} = \sqrt{\sum_{\tau=-1}^{-\kappa}\left(R_{i,\tau} - \bar{R}_i\right)^2/(\kappa - 1)}$ and $N_{J,t}$ is the number of firms in business class *J* at Statistical Period date *t*. For Fama and MacBeth (1973) regressions, we define an across business class volatility variable at month *t*, $\sigma_{BC,t}$, as $\sigma_{D:NIFD,t}$ for element *b*=1,…,20 (that is, the same number repeated 20 times), as $\sigma_{ND:NIFD,t}$ for element *b*=21,…,40 (again, same number repeated 20 times), and $\sigma_{IFD,t}$ for element *b*=41,…,60 (again, the same number repeated 20 times). Each element in this vector of 60 elements is nonzero.

We define a differential within business class volatility variable at month *t* for D:NIFD firms (beyond the business class variable $\sigma_{BC,t}$) with nonzero elements for *b*=1,…,20 and zero otherwise. Element *b*=1,…,20 measures the volatility differential between portfolio *b* and the business class for D:NIFD companies, $\Delta\sigma_{D,t} = \sigma_{b,t} - \sigma_{D:NIFD,t}$ for *b*=1,2,…,20 and zero otherwise. Similarly, the elements for a differential within business class volatility-variable at month *t* for ND:NIFD firms, $\Delta\sigma_{ND,t}$, is zero for elements 1,…,20 and 41,…,60 and $\Delta\sigma_{ND,t}$=$\sigma_{b,t} - \sigma_{ND:NIFD,t}$ for *b*=21,…,40. Similarly, the elements for a differential within business class volatility variable at month *t* for IFD firms, $\Delta\sigma_{IFD,t}$, is zero for elements *b*=1,…,41 and $\Delta\sigma_{IFD,t}$=$\sigma_{b,t} - \sigma_{IFD,t}$ for elements *b*=41,…,60. In our Fama-MacBeth regressions below, $\sigma_{BC,t}$ measures the impact of volatility on returns across business classes and the variables $\Delta\sigma_{D,t}$, $\Delta\sigma_{ND,t}$, and $\Delta\sigma_{IFD,t}$ measure the differential impact of volatility on returns within each business class, respectively.

We use the notation $\chi_{i,b,t}$ to represent corporate growth for firm *i* in portfolio *b*=1,2,…,60, which is annual CAPX relative to net fixed assets (NFA) from the most recent year-end financial report before Statistical Period *t*. For our Fama and MacBeth (1973) regressions, we define an across business class growth variable at month *t*, $\chi_{BC,t}$ with the same methodology as in the previous paragraph for volatility. In addition, we define within business class growth variables at month *t* for D:NIFD firms, $\Delta\chi_{D,t}=\chi_{b,t}-\chi_{D:NIFD,t}$, for ND:NIFD firms, $\Delta\chi_{ND,t}=\chi_{b,t}-\chi_{ND:NIFD,t}$, and for IFD firms, $\Delta\chi_{IFD,t}=\chi_{b,t}-\chi_{IFD,t}$ (again using the methodology in the previous paragraph).

We regress the return for portfolio *b* at month *t*, $r_{b,t}$, on eight independent variables: four related to volatility and four related to growth (all measured prior to month *t*), $\sigma_{BC,t}$, $\Delta\sigma_{D,t}$, $\Delta\sigma_{ND,t}$, $\Delta\sigma_{IFD,t}$, $\chi_{BC,t}$, $\Delta\chi_{D,t}$, $\Delta\chi_{ND,t}$, and $\Delta\chi_{IFD,t}$, over the 60 portfolios *b*=1,2,…,60. We use volatility and growth as explanatory variables because they have theoretical justification from the equilibrium equity valuation model of Blazenko and Pavlov (2009) and we eschew variables without theoretical underpinning. In particular, we use no market variables like size, book/market or earnings yield to avoid econometric endogeneity. Our analysis in the current section is an ex-ante association between financial measures that investors can use for investment strategies before return realization. Our multifactor asset-pricing analysis in a later section is an ex-post contemporaneous association between portfolio returns and risk-factors. We form portfolios with forward *ROE* but include only volatility and growth as explanatory variables in equation (6) because profitability is not itself a risk-factor. Rather, profitability determines volatility and growth, which are risk-factors. In the current subsection, we study raw returns. In a later subsection, we study abnormal returns. For Statistical Period dates before 7/20/1978 there are less than 20 IFD firms and, therefore, we start our analysis thereafter. We repeat the cross-sectional regression in equation (6) for 402 statistical period months between 7/20/1978 and 1/19/2012 and report temporal averages of coefficient estimates in Table 4,

$$r_{b,t}=a_0+a_1\cdot\sigma_{BC,t}+a_2\cdot\Delta\sigma_{D,t}+a_3\cdot\Delta\sigma_{ND,t}+a_4\cdot\Delta\sigma_{IFD,t}$$
$$+a_5\cdot\chi_{BC,t}+a_6\cdot\Delta\chi_{D,t}+a_7\cdot\Delta\chi_{ND,t}+a_8\cdot\Delta\chi_{IFD,t}+\varepsilon_t \quad b=1,2,\dots,60 \quad (6)$$

Table 4: Fama-MacBeth Regressions of Portfolio Returns versus Volatility and CAPX Rates

Independent Variable	Time Series Average of Parameter Estimates
Constant	$\overline{\hat{a}_0}=0.0119$ (3.92)
Volatility Across Business Classes	$\overline{\hat{a}_1}=-0.601$ (-3.14)
Within Business Class Voltility (D)	$\overline{\hat{a}_2}=-0.403$ (-2.30)
Within Business Class Voltility (ND)	$\overline{\hat{a}_3}=-0.270$ (-1.77)
Within Business Class Voltility (IFD)	$\overline{\hat{a}_4}=-0.106$ (-0.756)
Growth Across Business Classes	$\overline{\hat{a}_5}=0.056$ (2.75)
Within Business Class Growth (D)	$\overline{\hat{a}_6}=0.025$ (2.44)
Within Business Class Growth (ND)	$\overline{\hat{a}_7}=0.022$ (2.67)
Within Business Class Growth (IFD)	$\overline{\hat{a}_8}=-0.014$ (-1.45)
Average R^2	0.452
Average $\bar{R}^2$	0.366

Times series t-stats over parameter estimates are in parentheses. The notation D, ND, and IFD stands for dividend paying, non-dividend paying and in financial distress. The variable $\sigma_{BC,t}$ measures the impact of volatility on returns across business classes and the variables $\Delta\sigma_{D,t}$, $\Delta\sigma_{ND,t}$, and $\Delta\sigma_{IFD,t}$ measure the differential impact of volatility on returns within each of the business classes (D:NIFD, ND:NIFD, and IFD) respectively. We use the notation χ to denote corporate growth, which we measure as the annual CAPX rate relative to net fixed assets (NFA) from the most recent year-end financial report prior to statistical period date t. The variable $\chi_{BC,t}$ measures the impact of growth on returns across business classes and the growth variables, $\Delta\chi_{D,t}$ for D:NIFD firms, $\Delta\chi_{ND,t}$ for ND:NIFD firms, and $\Delta\chi_{IFD,t}$ for IFD firms, measure the differential impact of growth on returns within each of the business classes. We regress the return for portfolio b, $r_{b,t}$, on these eight independent variables (four for volatility and four for growth and all measured prior to month t) over the 60 portfolios b=1,2,…,60 at month t. We repeat this cross-sectional regression 402 times over the period 7/20/1978 to 1/19/2012 and report temporal averages of coefficient estimates.

Table 4 reports temporal averages of coefficient estimates in the cross-sectional Fama-Macbeth regressions in equation (6). The coefficient on the across business class volatility variable, $\overline{\hat{a}_1}$, is negative and statistically significant. The coefficient on the within-class volatility variables, $\overline{\hat{a}_2}$ and $\overline{\hat{a}_3}$, are negative and statistically significant for D:NIFD and ND:NIFD firms. This is strong evidence of a negative volatility impact on returns across business classes and within business classes but not for IFD firms. The coefficient on the across business class growth variable, $\overline{\hat{a}_5}$, is positive and statistically significant. The coefficients on the within-class growth variables $\overline{\hat{a}_6}$ and $\overline{\hat{a}_7}$ for D:NIFD and ND:NIFD firm, respectively, are also positive and statistically significant. This is strong evidence of a positive impact of growth-leverage on returns across and within business classes but not within-class for IFD firms.

Firms in Financial Distress and Managerial Risk Shifting

Across the business classes in Table 3, IFD firms have unexpectedly high CAPX rates that are roughly equal those of ND:NIFD firms and exceed by a wide margin those of D:NIFD firms. This observation is contrary to the Blazenko and Pavlov (2009) hypothesis that managers suspend business investments when faced with poor profit prospects. Rather, high CAPX rates with low profitability is consistent with managerial risk-shifting for firms in financial distress (Jensen and Meckling, 1976). We test this hypothesis by studying the relation between CAPX rates and profitability within and across business classes.

We regress the CAPX rate for portfolio b, $\chi_{J,b,t}$, on forward profitability, $ROE_{J,b,t}$, over the 20 portfolios in each of three business classes, *J*=D:NIFD, J=ND:NIFD, and J=IFD. We repeat these three cross-sectional regressions 432 times for *J*=D:NIFD and *J*=ND:NIFD firms and 402 times for *J*=IFD firms over Statistical Periods from 1/15/1976 to 12/15/2011 and from 7/20/1978 to 12/15/2011, respectively,

$$\chi_{D,b,t} = b_0 + b_1 \cdot ROE_{D,b,t} + \omega_t \quad b=1,2,\ldots,20$$
$$\chi_{ND,b,t} = b_0 + b_1 \cdot ROE_{ND,b,t} + \omega_t \quad b=21,\ldots,40 \qquad (7)$$
$$\chi_{IFD,b,t} = b_0 + b_1 \cdot ROE_{IFD,b,t} + \omega_t \quad b=41,\ldots,60$$

In Table 5, for D:NIFD and ND:NIFD firms, the relation between CAPX and forward *ROE* is positive and statistically significant. This observation is consistent with the argument that managers use profitability to fund business investment because of financing constraints or the hypothesis that managers suspend expansion investments when faced with poor profit prospects. For IFD firms, the relation between CAPX and forward *ROE* is negative and statistically significant, which means that IFD and NIFD firms differ. There is no evidence that IFD firms use profitability as a funding source or that forward *ROE* reflects business prospects to encourage investment. The evidence is consistent with managerial risk-shifting for IFD firms. CAPX rates are higher for IFD firms when they are in the greatest financial distress.

Table 5: Fama-MacBeth Regressions of Portfolio CAPX on Forward Profitability (*ROE*)

Independent Variable	Dividend Paying (1/15/1976-12/12/2011)	Non-Dividend Paying (1/15/1976-12/12/2011)	In Financial Distress (7/20/1978-12/15/2011)
Constant	0.148 (102.2)	0.289 (83.0)	0.317 (39.2)
Forward ROE	0.423 (36.87)	0.317 (23.1)	-0.81 (-3.15)
Average R^2	0.58	0.37	0.19
Average $\bar{R}^2$	0.56	0.33	0.14

Forward annual ROE is I/B/E/S consensus analysts' annual earnings forecasts for the next unreported fiscal year as forward earnings divided by book equity from the most recent quarterly report prior to statistical period t. We report temporal averages of the coefficient estimates with t-stats in parentheses that are Newey and West (1987) adjusted.

There is further evidence of managerial risk-shifting in Table 5. Intercepts estimate CAPX rates of 31.7%, 14.8% and 28.9% a year for IFD, D:NIFD, and ND:NIFD firms with zero forward *ROE*, respectively. These estimates mean that CAPX has a "path dependence." Firms with modest profit prospects (zero forward *ROE*) have greater CAPX rates if they have been in financial distress recently (negative TTM earnings) compared with if they have not. This evidence is consistent with managers taking on risky investments because of financial distress.

Abnormal Portfolio Returns

In this section, we report evidence that D:NIFD firms have positive alphas, ND:NIFD firms have zero alphas, and IFD firms have negative alphas. If the multifactor asset-pricing model we use for bench-marking represents the collective understanding of investors in financial markets, we conclude that they do not recognize risk differences between these firms.

We use the Fama-French-Carhart four factor model (Fama and French, 1996, Carhart, 1997) with book/market, size, momentum, and a market factor to represent normal returns.

We need risk factors between Statistical Period dates like returns in equation (2). From Ken French's website, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library, we download daily returns for the six Fama and French (1993) size and B/M portfolios to calculate monthly SMB and HML factors (value-weighted portfolios formed on size and then book/market) and the six size and momentum portfolios (value-weighted portfolios formed on size and return from twelve months to one month prior). To calculate monthly risk factors, we compound daily returns following the procedure on Ken French's website to create monthly SMB, HML, MOM, and market risk factors for statistical period months rather than calendar months. We risk-adjust the 60 D:NIFD, ND:NIFD, and IFD portfolios with these risk factors in the regression,

$$R_{b,t} - R_{f,t} = \alpha_b + \beta_{M,b} \cdot \left(R_{M,t} - R_{f,t}\right) + \beta_{SMB,b} \cdot SMB_t + \beta_{HML,b} \cdot HML_t + \beta_{MOM,b} \cdot MOM_t + \epsilon_{b,t}, \quad (8)$$

where $R_{b,t}$ is the return on portfolio b=1,2,…,60, in month t = 1,2,…,T, $R_{M,t}$ is the return on the *CRSP* value weighted index of common stocks in month t, SMB_t and HML_t are the small-minus-big and high-minus-low Fama-French factors, and MOM_t is the momentum factor. The monthly riskless rate, $R_{f,t}$, is the compounded simple daily rate, downloaded from the website of Ken French, that, over the trading days between statistical period dates, compounds to a 1-month T-Bill rate.

The purpose of the Gibbons, Ross, and Shanken (1989) (GRS) test is to search for pricing errors in an asset pricing model. We use the GRS statistic to test the hypothesis the regression intercepts are jointly equal to zero, $\alpha_1 = \alpha_2 = \cdots = \alpha_{20} = 0$, $\alpha_{21} = \alpha_{22} = \cdots = \alpha_{40} = 0$, and $\alpha_{41} = \alpha_{42} = \cdots = \alpha_{60} = 0$ within the D:NIFD, ND:NIFD, and IFD business classes. The alternative hypothesis is that there is a missing factor in the asset pricing model for a business class.

In Panel A of Table 6, the alphas for the twenty D:NIFD firms (b=1,2,…,20) are almost all positive and most are statistically significant especially for high profitability portfolios. The only portfolio with a negative alpha is b=1 (lowest profitability D:NIFD portfolio) but this alpha is not statistically significant. The two lowest profitability ND:NIFD portfolios (b=21 and b=22) have statistically negative alphas and the two highest profitability ND:NIFD portfolios (b=39 and b=40) have statistically positive alphas. Other than these two pairs, alphas for ND:NIFD portfolios are sometimes positive and sometimes negative but rarely statistically significant. The alphas for portfolios of IFD firms (b=41,…,60) are uniformly negative and often statistically significant.

The GRS statistic rejects the hypothesis $\alpha_1 = \alpha_2 = \cdots = \alpha_{20} = 0$ for D:NIFD firms but fails to reject the hypothesis $\alpha_{21} = \alpha_{22} = \cdots = \alpha_{40} = 0$ for ND:NIFD firms and $\alpha_{41} = \alpha_{42} = \cdots = \alpha_{60} = 0$ for IFD firms. These results suggest a missing factor for D:NIFD firms in the Fama-French-Carhart asset pricing model.

Factor Betas

The factor betas in Table 6 offer some interesting insights into the nature of risk for D:NIFD, ND:NIFD, and IFD firms. First, in Panel A, market betas are lowest for D:NIFD firms, higher for ND:NIFD firms, and highest for IFD firms. For portfolios of D:NIFD and ND:NIFD firms, market betas increase from low profitability to high profitability (b=1 to b=20 and b=21 to b=40).

In Panel B, SMB betas are lowest for D:NIFD firms, higher for ND:NIFD firms, and highest for IFD firms, which means that IFD firms are smallest, ND:NIFD firms larger, and D:NIFD firms largest.

The HML beta is largest and positive for D:NIFD portfolios. This observation means that part of the reason that D:NIFD firms have high raw returns is that they are value stocks although there is only modest confirming evidence for this observation in Table 3. Despite this high D:NIFD risk factor, in Panel A of Table 6, D:NIFD firms have positive alphas. In Panel C of Table 3, IFD firms have higher book/market than D:NIFD firms in Panel A. The HML beta for IFD portfolios in Panel B of Table 6 are sometimes positive and sometimes negative but rarely large. Thus, value is not a determinant of low IFD returns.

The momentum (MOM) beta is negative and always statistically significant for IFD firms (b=41,…,60). Of course, IFD firms have negative TTM earnings and, thus, their share prices have often decreased in the recent past. Lowest profitability D:NIFD and ND:NIFD portfolios have negative MOM betas. Highest profitability D:NIFD and ND:NIFD portfolios have positive MOM betas. Both these results arise from selection.

CONCLUDING COMMENTS

In this paper, we explain why the returns for non-dividend paying firms are no greater than dividend paying firms despite high risk metrics. We argue this anomaly arises because a larger fraction of non-dividend paying firms are in financial distress and, despite high distress-risk and high growth-leverage, firms in financial distress have low returns from high volatility that decreases the options-leverage of equity. We test this hypothesis with common-share returns and reporting data for US publicly traded companies. We find no unconditional return difference even though non-dividend paying firms have several characteristics that suggest high risk. Equivalently, because non-dividend paying firms have high risk-metrics, their returns are abnormally low compared with dividend-paying firms. Consistent with our hypothesis, we find that removing firms in financial distress from our sample (negative trailing twelve month earnings), returns for non-dividend paying firms increase relative to dividend-paying firms and abnormal returns disappear.

We argue that part of the reason that firms in financial-distress have high volatility that induces low returns is managerial risk-shifting. Consistent with this hypothesis, we present evidence that firms in financial distress have with unexpectedly high capital expenditure rates and firms in the greatest financial distress have the greatest capital expenditure rates.

We argue that volatility and growth-leverage have opposite impacts on returns. Consistent with this hypothesis, we find that across business classes, firms in financial distress with high volatility have low returns despite high growth-leverage and, within business classes, high profitability firms (not in financial distress) have both high raw-returns and high abnormal-returns despite high volatility.

Limitations of our Study

We have not explained why volatility dominates growth-leverage across business classes to produce low returns for firms in financial distress or why growth-leverage dominates volatility within business classes to produce high returns for high-profitability firms despite high volatility. An investigation of the relative strength of these forces and their joint impact on returns requires more exacting equity valuation models than the current financial literature provides.

Our explanation for high capital expenditure rates for firms in financial distress is managerial risk-shifting. There are alternative explanations. Blazenko and Pavlov (2010) argue that cost of capital is lesser for innovative compared with standard investments. Thus, high capital expenditure rates and low returns for firms in financial distress can arise if their investments are more innovative than other firms. Future research will test alternative hypotheses for high capital expenditure rates for firms in financial distress.

Additional Topics for Future Research

We have taken an investor perspective in our study of dividend-paying and non-dividend paying firms. For example, our ranking of firms by forward *ROE* in Table 3 creates an almost identical ranking of firms by realized average returns. We presume this ranking gives investors an equivalent expected-return ranking they can use for their portfolio decisions. Of course, an investor prospective is the opposite side of the same "coin" for corporate financial purposes and the equity cost of capital in the weighted average cost of capital. For this purpose, we need greater precision than is possible from an ordinal ranking of average realized raw returns. Instead, we need an equity cost of capital that reflects current interest rate conditions. To do this, we can reproduce Table 3 with excess returns above a "riskless" interest rate rather than average raw returns. The equity cost of capital for a particular firm from a particular business class and with a particular forward *ROE* is the current riskless interest rate plus a risk premium equal to a temporal average of past realized excess returns. In future research, we plan a comparison this equity cost of capital with alternatives.

Second, in the current paper, except when we use standard asset pricing methods, we avoid market measures as explanatory regression variables to avoid endogeneity problems. One market measure is the market/book ratio. Our analysis suggests a new hypothesis for the value-premium (high market/book "growth" stocks have lower returns than low market/book "value" stocks). We call this hypothesis the "Equity as a Call Option Hypothesis for the Value-Premium." The option features of high volatility firms gives them high market/book ratios and low returns (Galai and Masulis, 1976). We plan to test this hypothesis against alternative value-premium explanations in the financial literature.

Third, in the current paper, we note that average returns are lower but return skewness is greater for firms in financial distress compared with other firms. Our interpretation of this observation is that investors accept low returns because of a skewness preference. We plan a test this hypothesis in future research.

Table 6: Fama-French-Carhart Four-Factor Asset Pricing Model

Panel A: Alpha, Market Beta, and SMB Beta									
	Alpha			Market Beta			SMB Beta		
Portfolio	D:NIFD	ND:NIFD	IFD	D:NIFD	ND:NIFD	IFD	D:NIFD	ND:NIFD	IFD
b=1,21,41	-0.0015	-0.0033*	-0.0092**	0.98	1.11**	1.27***	0.56***	0.95***	2.07***
b=2,22,42	0.0000	-0.0039***	-0.0039	0.92***	1.08	1.21**	0.44***	1.06***	2.02***
b=3,23,43	0.0005	-0.0015	-0.0056*	0.87***	1.05	1.07	0.36***	1.11***	1.96***
b=4,24,44	0.0009	0.0006	-0.0051	0.87***	1.06*	1.10	0.29***	1.00***	2.10***
b=5,25,45	0.0022**	-0.0006	-0.0079**	0.86***	1.07**	1.25***	0.24***	0.97***	1.84***
b=6,26,46	0.0007	-0.0019	-0.0020	0.86***	1.07	1.17***	0.24***	0.93***	1.67***
b=7,27,47	0.00023**	0.0000	-0.0001	0.86***	1.07*	1.14**	0.28***	1.00***	1.73***
b=8,28,48	0.0012	-0.0010	-0.0022	0.89***	1.06*	0.99	0.34***	1.03***	1.63***
b=9,29,49	0.0026***	-0.0012	-0.0076***	0.88***	1.08**	1.06	0.32***	0.89***	1.57***
b=10,30,50	0.0021**	0.0016	-0.0018	0.91***	1.12***	1.08	0.35***	0.88***	1.50***
b=11,31,51	0.0020**	-0.0008	-0.0050**	0.94**	1.13***	1.14***	0.34***	0.96***	1.50***
b=12,32,52	0.0025**	-0.0009	-0.0064***	0.95*	1.18***	1.18***	0.30***	0.91***	1.39***
b=13,33,53	0.0026**	0.0003	-0.0055***	0.97	1.14***	1.07	0.32***	0.92***	1.23***
b=14,34,54	0.0031***	0.0030*	-0.0001	0.98	1.18***	1.18***	0.27***	1.02***	1.06***
b=15,35,55	0.0022**	0.0009	-0.0025	1.00	1.20***	1.14***	0.21***	0.79***	1.25***
b=16,36,56	0.0031***	0.0027	-0.0028	1.04	1.19***	1.07*	0.24***	0.87***	1.27***
b=17,37,57	0.0027**	0.0020	-0.0014	1.05*	1.21***	1.14***	0.20**	0.74***	1.19***
b=18,38,58	0.0024**	0.0021	-0.0006	1.08***	1.23***	1.21***	0.18**	1.03***	1.07***
b=19,39,59	0.0028***	0.0035*	-0.0010	1.10***	1.22***	1.18***	0.20**	1.01***	1.28***
b=20,40,60	0.0035***	0.0046**	-0.0021	1.07***	1.30***	1.20***	0.18**	1.06***	1.35***
GRS	1.69	1.34	1.25						
(p-value)	0.032	0.149	0.209						

Panel B: HML Beta, MOM Beta, and R^2									
	HML Beta			Momentum Beta			R^2		
Portfolio	D:NIFD	ND:NIFD	IFD	D:NIFD	ND:NIFD	IFD	D:NIFD	ND:NIFD	IFD
b=1,21,41	0.54***	0.15**	-0.11	-0.19***	-0.34***	-0.30**	0.88	0.77	0.63
b=2,22,42	0.52***	0.16**	-0.06	-0.12***	-0.19***	-0.28***	0.89	0.83	0.66
b=3,23,43	0.57***	0.26***	-0.27**	-0.12***	-0.17***	-0.35***	0.89	0.82	0.69
b=4,24,44	0.55***	0.09	-0.29**	-0.10***	-0.18***	-0.35***	0.88	0.81	0.69
b=5,25,45	0.50***	0.10	-0.13	-0.08***	-0.12***	-0.26***	0.88	0.80	0.73
b=6,26,46	0.48***	0.09	-0.05	-0.04	-0.13***	-0.31***	0.88	0.77	0.75
b=7,27,47	0.43***	0.07	-0.25**	-0.07***	-0.11**	-0.36***	0.87	0.81	0.72
b=8,28,48	0.45***	0.02	0.10	-0.03	-0.13***	-0.31***	0.88	0.84	0.67
b=9,29,49	0.41***	0.01	-0.02	-0.05	-0.12**	-0.34***	0.87	0.81	0.76
b=10,30,50	0.38***	-0.07	0.01	-0.06*	-0.08	-0.39***	0.88	0.79	0.68
b=11,31,51	0.40***	0.07	0.18*	-0.08**	-0.08	-0.36***	0.88	0.83	0.82
b=12,32,52	0.35***	0.09	0.25***	-0.03	-0.02	-0.29***	0.85	0.76	0.78
b=13,33,53	0.37***	-0.07	0.12*	-0.07*	-0.07	-0.24***	0.86	0.81	0.77
b=14,34,54	0.31***	-0.06	0.22***	-0.05	-0.03	-0.25***	0.86	0.82	0.80
b=15,35,55	0.29***	-0.10	0.15	0.01	-0.08*	-0.22***	0.86	0.83	0.75
b=16,36,56	0.21***	-0.18**	0.22***	-0.01	0.02	-0.26***	0.87	0.81	0.82
b=17,37,57	0.22***	-0.15*	0.13*	0.00	-0.03	-0.16***	0.87	0.80	0.77
b=18,38,58	0.12**	-0.14*	0.19*	-0.02	0.01	-0.27***	0.87	0.82	0.79
b=19,39,59	0.10*	-0.19**	0.15*	-0.03	0.01	-0.22***	0.88	0.81	0.77
b=20,40,60	0.07	-0.13	0.06	0.01	0.03	-0.20***	0.85	0.78	0.72

The symbols ***, **, and * represent statistical significance at the 1, 5, and 10% levels, respectively. The test for market betas, $\beta_{M,b}$, is against a null-hypothesis of unity and all other t-tests are against a null-hypothesis of zero.

APPENDIX

In the modeling of equation (1), if the returns of portfolio 2 determine the returns of portfolio 1 (plus an error), and if a multifactor model determines the returns of portfolio 2, then the excess return of portfolio 1 will be β times that of portfolio 2. Thus, we do not assume a single factor return generating model.

Suppose a two-factor model (factor A and B) for the returns of portfolio 2 (the generalization is obvious),

$r_2 = E(r_2) + g_A \cdot f_A + g_B \cdot f_B + \xi$ (A1)

where $f_A = r_A - E(r_A)$ and $f_B = r_B - E(r_B)$ are the unexpected parts of economic factors A and B that determine returns. The excess return of portfolio 2 is

$E(r_2) - r_f = g_A \cdot [E(r_A) - r_f] + g_B \cdot [E(r_B) - r_f]$ (A2)

Since the returns of portfolio 2 determine the returns of portfolio 1,

$r_1 = \alpha + \beta \cdot r_2 + \epsilon$ (A3)

Substitute equation (A1) in (A3),

$r_1 = \alpha + \beta \cdot [E(r_2) + g_A \cdot f_A + g_B \cdot f_B + \xi] + \epsilon$

$= \alpha + \beta \cdot E(r_2) + \beta \cdot g_A \cdot f_A + \beta \cdot g_B \cdot f_B + \beta \cdot \xi + \epsilon$ (A4)

$= [\alpha + \beta \cdot E(r_2)] + (\beta \cdot g_A) \cdot f_A + (\beta \cdot g_B) \cdot f_B + [\beta \cdot \xi + \epsilon]$

Take the expectation of (A3),

$E(r_1) = \alpha + \beta \cdot E(r_2)$ (A5)

and replace the first term of (A4) with (A5),

$r_1 = E(r_1) + (\beta \cdot g_A) \cdot f_A + (\beta \cdot g_B) \cdot f_B + [\beta \cdot \xi + \epsilon]$ (A6)

(A6) shows that the return of portfolio 1 is determined by the two factors, A and B, with sensitivity βg_A for factor A and βg_B for factor B. Therefore, the excess return of portfolio 1 becomes:

$E(r_1) - r_f = (\beta \cdot g_A) \cdot [E(r_A) - r_f] + (\beta \cdot g_B) \cdot [E(r_B) - r_f]$

$=\beta\{g_A \cdot [E(r_A) - r_f] + g_B \cdot [E(r_B) - r_f]\}=\beta[E(r_2) - r_f]$

The excess return of portfolio 1 is β times that of portfolio 2.

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