Takeovers and The Cross-Section of Returns

K. J. MARTIJN CREMERS

VINAY B. NAIR

KOSE JOHN*

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*Cremers is from the International Center for Finance at the Yale School of Management; Nair is from the Wharton School at the University of Pennsylvania; and John is from the Stern School of Business at New York University. The authors thank Andy Abel, William T. Allen, John Core, Robert Daines, Joao Gomes, Andrew Metrick, Stew Myers, Stavros Panageas, Michael Roberts, Antoinette Schoar, Jessica Wachter, and Moto Yogo; as well as participants at the Wharton workshop and MIT for comments and/or helpful discussions.

ABSTRACT

This paper considers the impact of takeover (or acquisition) likelihood on firm valuation. If takeover activity responds to investor expectations of future rates of return, and hence to time variation in risk premia, firms more likely to be takeover targets will have greater exposure to the state variable(s) related to time-varying risk premia. We show that firms exposed to takeovers have a higher required rate of return and yet a higher value than similar firms that are protected from takeovers. To test the framework, we estimate the likelihood that a firm will be acquired and create a takeover-spread portfolio that buys firms with a high likelihood of being acquired and shorts firms with low likelihood of being acquired. Such a takeover-spread portfolio should proxy for state variables related to time-varying risk premia. The takeover-spread portfolio generates annualized abnormal returns of up to 11.5% between 1980 and 2004, and is important in explaining cross-sectional differences in equity returns. Finally, we provide an explanation for the existence of abnormal returns associated with governance-spread portfolios (Gompers, Ishii and Metrick, 2003 and Cremers and Nair, 2005).

I. Introduction

This paper considers the impact of the takeover channel on valuation. This investigation is motivated by two observations - (1) that equity risk premia are time varying (see, e.g., Shiller 1984; Campbell and Shiller 1988; Fama and French 1988, 1989; Campbell, 1991; Hodrick 1992; Lamont 1998; Lettau and Ludvigson 2001) and (2) takeover activity is time varying (Bruner, 2004). While it is well known that target shareholders receive a large premium on a takeover, how the expectation of this premium affects firm valuation has not been investigated. One reason for the lack of interest is the assumption that differences in takeover exposure are purely idiosyncratic and hence do not affect a firm's cost of capital. In that case, the issue of incorporating the takeover channel into valuation is solved by simply adding the expected takeover premium to the expected cash flows. But the two observations above suggest that the likelihood of being taken over may not be purely idiosyncratic.

An alternative motivation arises from the findings of papers that investigate the link between corporate governance and equity returns. Gompers, Ishii and Metrick (2005) (henceforth GIM) use classifications based on a governance index (G) they develop to show that a portfolio that buys firms with the highest level of shareholder rights and sells firms with the lowest level of shareholder rights generates an annualized abnormal return of 8.5% from 1990 to 1999. Cremers and Nair (2005) (henceforth CN), in their investigation of how different governance mechanisms interact, show that these abnormal returns exist (and are higher) only when the firm has both low takeover protection, captured by G, and a blockholder (or high public pension fund ownership).[1] The magnitude and the persistence of these abnormal returns, if not simply the existence, merits explanation. Two main alternatives exist. First, as suggested in GIM, it might be that investors, in 1990, were not aware of the importance to corporate governance (or shocks related to corporate governance) and hence did not price in the effects of corporate governance. Second, it might be the case that the asset pricing model

[1] Bebchuk, Cohen and Ferrell (2004) has confirmed the result in GIM using a narrower index that uses 6 critical elements (out of 24) in the original index compiled by GIM.

employed is incomplete and further still, the incompleteness is somehow related to differences in firms' governance structures. In this paper, we hope to shed light on the latter explanation by studying the link between takeovers, an important aspect of governance, and firm valuation.

We use the idea that takeover activity responds to investor expectations of future rates of return.[2] When the required rate of return is low (as in boom periods), firms tend to acquire, thereby increasing the prices of firms that are more likely to be targets. Thus firms with greater exposure to takeovers, ceteris paribus, have a higher exposure to the state variable(s) that dictate time variation in risk premia. Moreover, the difference in the prices between firms that differ in their takeover vulnerability should fluctuate and be related to these state variables that affect the equity risk premium.

The extent of acquisition activity and the magnitude of takeover premia over the last two decades provide us with a notion of how significant these price differences could be. Mitchell and Stafford (2003) document 1,427 completed deals between 1980 and 1989 and 2,040 completed deals between 1990 and 1998.[3] The median bid premium was also high - 37.7% in the eighties and 34.5% in the nineties. Thus differences in prices due to differences in takeover vulnerability could be important.

We first present our idea in a theoretical framework that uses an asset pricing model to value firms that differ in their takeover exposure. A feature of the asset pricing model is a time-varying risk premium that is captured by a state variable. We show that firms differing in their takeover exposure differ in their exposure to this state variable. More specifically, firms exposed to takeovers have a higher exposure to the state variable(s) associated with time variation in the risk premium. This is because investors receive the takeover premium precisely when they least need it - in boom periods, when future required rates of return are

[2] This is similar in spirit to the Q-theory of investments (Abel (1983)). Also see Jovanovic and Rosseau (1999). Recently, other theories have been proposed to explain the time variation in takeover activity that rely on mis-valuation in capital markets (see Shleifer and Vishny (2003) and Viswanathan and Rhodes-Kropf (2004)). Under certain conditions, to be discussed in section 2, the use of such mis-valuation theories to explain time varying takeover activity does not affect the interpretation of our results.

[3] Acquisition activity further increased in 1999 and 2000 before dropping in 2001.

low. Consequently, investors require a higher rate of return on firms exposed to takeovers. It also follows, perhaps counter-intuitively, that despite a higher required rate of return, firms with greater takeover exposure are also valued higher. This is due to expectations of a takeover premium, which is absent for a firm protected from takeovers.

Next, we document four sets of results to support the theory. First, we show that a portfolio that buys firms with a high takeover vulnerability, estimated using a logit regression, and shorts firms with a low takeover vulnerability is associated with annualized abnormal returns of 11.35% relative to the four-factor Fama-French (1992) and Carhart (1997) model between 1980 and 2003. This suggests that the Fama-French model does not account for state variables that are associated with time-varying risk premia. Second, we use the returns to the takeover-spread portfolio to propose a 'TAKEOVER' factor. The TAKEOVER factor is expected to proxy for the risk due to state variables that affect time variation in risk premia. The proposed factor explains differences in the cross-section of equity returns. Further, the inclusion of this factor, in addition to the market, size, book-to-market and momentum factors, significantly increases R-squares of cross-sectional asset pricing regressions and improves the pricing performance.

Third, we show that abnormal returns associated with governance-spread portfolios (GIM and CN) decrease significantly once the asset pricing model includes the TAKEOVER factor in addition to the Fama-French factors and the momentum factor. Fourth and finally, we also show that the returns to the takeover-spread portfolio formed predict real takeover activity.

The central idea in this paper - that the price difference between firms differing in takeover exposure is related to state variables that affect time variation in risk premia - contributes to another area of active research. In particular, the paper contributes to the empirical asset pricing literature that uses factors other than the market factor to capture time variation in risk premia. While an intertemporal capital asset pricing model was proposed as early as 1973 (Merton, 1973), empirical work to detect stochastic variation in investment opportunities, with the notable exception of Campbell (1993), has only been recent (see, e.g., Brennan and

Xia, 2004).[4] By noting that the price difference between firms differing in takeover exposure is related to state variables that affect risk premia, we can now proxy these (unobservable) state variables. Thereby, we also investigate if the empirically successful Fama-French model accounts for such time variation in investment opportunities.

The results in the paper indicate that the widely used Fama-French asset pricing model is incomplete and imply that the benefits of corporate governance should not be inferred from the abnormal returns (relative to the Fama-French model) that GIM and CN document. It might indeed be true that better governance is beneficial as suggested by the association between better governance with higher valuations and better operating performance (see GIM and CN) but the association of governance with abnormal returns is due to only one aspect of governance - takeover vulnerability - that is related to the missing factor in the Fama-French asset pricing model. Thus using these abnormal returns to advocate the case of stronger corporate governance could be misleading.

In the next section, we present a simple theoretical framework to highlight the main idea in this paper. In section 3, we form portfolios based on different levels of takeover vulnerabilities and investigate their returns. In section 4, we propose a 'takeover' factor to explain differences in the cross-section of equity returns. In section 5, we test the sensitivity of the abnormal returns associated with governance-spread portfolios to an asset pricing model that includes a takeover-spread portfolio to capture the risk associated with state variables. In section 6, we investigate whether the TAKEOVER portfolio is associated with takeover activity in the economy. Section 7 concludes.

[4] Brennan, Wang and Xia (2004) note that "However, despite this evidence of time variation in investment opportunities, and despite the lack of empirical success of the classic single period CAPM and its consumption variant, there has been little effort to test models based on Merton's classic framework."

II. Takeovers and Asset Prices

This section presents a simple framework to highlight the differences in valuation between firms that are differ in their exposure to takeovers, but are otherwise identical. The framework combines two ingredients relating to the (1) asset pricing model used and (2) the takeover activity in the economy.

A. Asset pricing

A large and growing body of empirical work finds that expected excess returns on aggregate stock market indexes are predictable, pointing towards a recession related time-varying risk premium (see, e.g., Shiller 1984; Campbell and Shiller 1988; Fama and French 1988, 1989; Campbell 1991; Hodrick 1992; Lamont 1998; Lettau and Ludvigson 2001). To capture this time-varying risk premium, we introduce a state variable, S. We do not take a stand on the source of this state variable - e.g., time-varying risk aversion (Campbell and Cochrane, 1999), time-varying labor income uncertainty (Constantinides and Duffie, 1999), liquidity etc. - and consequently, do not take a stand on the relative merits between the various models that generate time-varying risk premia.

Even without imposing any theoretical structure and appealing instead to a well-known existence theorem (Harrison and Kreps, 1979), we can state the relation between asset prices and a stochastic discount factor. This theorem states that, in the absence of arbitrage, there exists a stochastic discount factor, or pricing kernel, M_{t+k}, such that, for any traded asset with a net excess return at time $t+k$ of $R^e_{i,t+k}$, the following equation holds

$$E_t[M_{t+k}R^e_{i,t+k}] = 0,$$

where E_t denotes the expectation conditional on information available at time t. Thus,

$$E_t[R^e_{i,t+k}]E_t[M_{t+k}] = -cov[R^e_{i,t+k}, M_{t+k}]. \tag{1}$$

Next, we assume that the stochastic discount factor depends on $F(0 \leq F)+1$ state variables, with one of them being the state variable that describes the time-varying risk premium (S). By using a higher value of the state variables to indicate a higher level of consumption, it follows that the marginal rate of substitution of the representative investor decreases for high future realizations of the state variable S.

$$\frac{dM_{t,t+k}}{dS_{t+k}} < 0. \tag{2}$$

Since a stochastic discount factor can be approximated by a Taylor expansion to a linear form, we can express such a discount factor by $M = a + \mathbf{b}'\mathbf{f} + tS$.[5]

Thus (1) can be rewritten as

$$E_t[R^e_{i,t+k}] = \Sigma_{f=0,F}\lambda_f'\beta_{if} + \lambda_S\beta_{iS}, \tag{3}$$

where β_{if} is given by $\frac{cov(R^e_{i,t+k}, f_{t+k})}{var(f_{t+k})}$ and $\beta_{is} = \frac{cov(R^e_{i,t+k}, S_{t+k})}{var(S_{t+k})}$. The market price of the risk is denoted by λ. Of interest is the market price of risk associated with the state variable that describes the time-varying risk premium, denoted by $\lambda_S = \frac{tvar(S_{t+k})}{E(M_{t+k})}$.

The risk premium is time-varying because λ_S varies with S. To capture the idea that the required rate of return is high in recessions, we assume that

$$\frac{d\lambda_S}{dS} < 0 \tag{4}$$

[5] As an example, consider the stochastic discount factor specified by Campbell and Cochrane (1999). The discount factor is given by $M_{t,t+k} = (\frac{S_{t+k}}{S_t}\frac{C_{t+k}}{C_t})^{-\gamma}$, where C denotes the consumption and S denotes the consumption surplus ratio. This is approximately equal to $M_{t,t+k} = 1 - \gamma\frac{S_{t+k}-S_t}{S_t} - \gamma\frac{C_{t+k}-C_t}{C_t}$.

When the state variable is low, the risk premium is high; and when the state variable is high, the risk premium is low. Viewing the state variable to be related to recessions, the risk premium is high in recessions and conversely low in boom periods.[6] We use the $F+1$ factor model specified above to price assets in the economy.

B. Takeover Activity

We now specify a simple environment that allows us to focus on the differences in valuation that arise due to differences in takeover vulnerability. Consider a scenario with one acquirer, A, and two potential targets, E and N. Both potential targets have identical final cashflows of X_T that, for simplicity, are realized without any uncertainty. They, however, differ in the level of managerial entrenchment that changes the likelihood with which a takeover bid succeeds. Examples of managerial entrenchment devices include takeover defenses and leverage (Stulz (1988) and Harris and Raviv(1988)). We assume that the manager of firm E is more entrenched than the manager of firm N, even as both managers enjoy private benefits (B_E and B_N).[7]

At time $t+k<T$ the acquirer can attempt an acquisition. Since the manager of firm E is more entrenched, a bid for firm E is less likely to succeed. As an extreme case, we consider the scenario when there is no chance of bid completion. In this case, the acquirer can only buy firm N. We assume that the acquirer can improve the target cashflows from X_T to $X_T(1+\sigma)$. Here, σ denotes the potential synergies that can be attained by the combination of the two firms and is uncertain. The perceived synergy is shared between the target, who receives a takeover premium ($X_T\Delta$), and the acquirer.[8] Since the large body of evidence on share price reactions around takeover announcements suggests that on an average targets receive a positive premium

[6] See Campbell and Cochrane (1999) for an example of a specification that is consistent with this assumption. In their specification, the consumption surplus ratio varies changing the market price of risk over time. For low levels of the consumption surplus ratio, S_t (accompanying recessions), the volatility of S_{t+k} is high.

[7] The managers can differ in their private benefits, based on which they follow entrenchment strategies. That is, managers with higher private benefits are more likely to be entrenched.

[8] The acquirer management might also receive private benefits (B_N) from the acquisition, such as those attributed with empire-building (Jensen, 1986).

while acquirer returns are insignificantly different from zero, we attribute all the synergies to the target.[9]

To show that aggregate wealth creation is not important for the main intuition, we also assume that these synergies come at the expense of the entrenched firm (E). Therefore, the two firms N and E can be viewed as competitors in an industry where after being acquired, the combined firm's bigger scale would enable it to benefit at the expense of firm E. We can now proceed to value the two firms, N and E, to highlight the difference in valuations due to different takeover vulnerability.

The values of firms N and E depend on the likelihood of receiving a takeover bid. At time $t+k$, the value of the synergies is

$$X_T\Delta = X_T E_{t+k}[M_T\sigma] = \frac{X_T E(\sigma)}{\frac{1}{E(M_{t+k,T})} + \Sigma_{f=0,f}\lambda_f\beta_{\sigma f} + \lambda_S\beta_{\sigma S}}, \tag{5}$$

which the target receives in the form of the takeover premium. The target manager sells the firm if the premium is above his private benefits, which is more likely to occur as λ_S, the risk premium, decreases. From (4), the risk premium decreases as S increases. Thus for all $S > S^*$, firm T is acquired where S^* is given by

$$\frac{X_T E(\sigma)}{\frac{1}{E(M_{t+k,T})} + \Sigma_{f=0,F}\lambda_f\beta_{\sigma f} + \lambda_S(S^*)\beta_{\sigma S}} = B.$$

Denoting the probability that $S_{t+k} < S^*$ by $F(S^*)$, the value of the firm N at time t, is then simply

$$F(S^*)X_T E[M_T] + E\left[I_{S>S^*}X_T\,(1+\Delta)\,M_{t+k}\right]$$

[9] See Bruner (2004) for a comprehensive survey.

where $I_{S>S^*}$ is an indicator variable that takes the value 1 for all $S > S^*$ and indicates a takeover. Similarly, the value to the entrenched firm, E, is

$$F(S^*)X_T E[M_T] + E[I_{S>S^*} X_T (1-\Delta) M_{t+k}],$$

due to expected losses associated with the takeover of the firm N. We can now state our main proposition relating differences in valuation to differences in takeover exposure.

Proposition 1 *The firm with greater exposure to takeovers has a higher expected rate of return due to a higher exposure to state-specific risk factors that affect time-varying risk premia. At the same time, firms with a higher exposure to takeovers, ceteris paribus, have a higher value.*

Proof: *This value of the firm exposed to takeovers can be rewritten as*

$$X_T E[M_T] + (1-F(S^*))X_T [E[M_{t+k}]E[\Delta \mid S > S^*] + cov(M_{t+k}, \Delta)] \quad (6)$$

We know from (5) that Δ is increasing with S_{t+k} and from (2) that M_{t+k} is decreasing with S_{t+k}. Thus, the last covariance term in (6) is negative.[10] *Thus the rate of return for firm N is higher than the risk free rate due to the exposure on the state variable related to a time-varying risk premium. Conversely, the rate of return for firm E is the lower than the risk free rate. Also, $(1-F(S^*))E[M_{t+k}\Delta \mid S > S^*] > 0$, so that the value of firm N is higher than that of firm E.*

As the future cost of capital decreases, the present value of the expected synergies increases. Since the increase in the present value of synergies not only increases the likelihood of a takeover but also the takeover premium that the acquirer can offer, the expected takeover premium that firms prone to takeovers expect is related to the future state variable (in this case, S_{t+k}). As a result, the firm prone to takeovers has a higher exposure to the state variable that affects the risk premium. Since a higher realization of the future state variable is associated with a lower stochastic discount factor today, the value of this expected takeover premium is

[10]The covariance between S_{t+k} and Δ is therefore positive.

lowered. However, since the value of this takeover premium remains positive, firms exposed to takeovers also have a higher valuation than firms protected from takeovers.

This central intuition is independent of the asset pricing model chosen, as long as the model captures time variation in the risk premium, either through conditioning variables (as in a conditional CAPM (Lettau and Ludvigson, 2001)) or through the addition of new state variables (as in Merton(1973) and Campbell and Cochrane (1999)). By observing the asset pricing model specified in (3), it is clear that any multifactor model (or an empirically equivalent conditional CAPM) where state variables are related to changing expected rates of return would also generate a similar result.

We now proceed to test the theory using the model proposed by Fama-French (1992) and an additional momentum factor (Carhart, 1997) as our benchmark model. Since our main focus is on the relation between governance and abnormal returns, we also use this benchmark model simply for the sake of consistency with GIM and CN.

III. Takeover-Spread Portfolios

We first investigate if firm specific differences in takeover exposure are related to differences in their equity returns. To this end, we form portfolios based upon the takeover vulnerability of each firm, and estimate the abnormal returns relative to the Fama-French model.

A. Takeover Vulnerability

To estimate the likelihood that a firm will be acquired, we use a logit regression. The firms acquired were identified from the Securities Data Corporation's (SDC) database. To focus on targets where the premium received is likely to be significantly high, we considered takeovers where 100% of the firm was acquired. Further, since takeovers can be friendly or hostile and since takeover vulnerability to a friendly deal can be different from vulnerability to a hostile bidder, we separate friendly targets from all targets. Since the probability of completing a hostile takeover is low and since incidences of hostile takeovers are themselves very infrequent, the loss of data by not considering hostile takeovers is low.[11] Among these targets of completed friendly acquisitions, we were able to find, from Compustat, firm-level information for 2,406 friendly targets between 1980 and 2004.[12]

Our first set of tests concern the probability of a takeover occurring over the 1980 to 2004 period. In the logit model, the target dummy is the dependent variable, and takes the value 1 if a firm is acquired. The logit model utilizes a number of independent variables that have been used in prior literature seeking to explain the probability of takeovers (see, for example, Hasbrouck (1985), Palepu (1986), and Ambrose and Megginson (1992)). The additional variables introduced based on the extant takeover literature are an industry dummy that measures whether a takeover attempt occurred in the same industry in the year prior to the acquisition, the return on assets of the firm, firm leverage (book debt to assets ratio), cash (the cash and short-term investments to assets ratio), firm size (market equity), Q (Market / Book ratio), and asset structure (measured by the property, plant and equipment to assets ratio). All these independent variables are measured at the end of the previous fiscal year.

In addition to these, we also include a variable to indicate the presence of an large external shareholder, as it has been argued that takeovers are more likely to occur as shareholder control increases (Shleifer and Vishny (1986)). We define external blockholders to be those institutional shareholders that have more than a 5% ownership stake in the firm's outstanding shares. To construct this measure, we use data on institutional share holdings from Thompson / CDA Spectrum, which collects quarterly information from SEC 13f filings. We then use a dummy variable, denoted by BLOCK, that takes the value 1 when an institutional block-

[11] In fact, Mitchell and Stafford (2003) note that the probability of a hostile bid being succesful was 7.1% in the eighties and 2.6% in the nineties. Further, only 14.3% of the acquisition transactions received a hostile bid at any point of time in the eighties and the corresponding number in the nineties was 4%.

[12] The number is a conservative estimate of the takeover activity since it considers only completed friendly takeovers where the percent acquired is 100%. To ensure that the results in this section are robust, we also estimated a logit regression with all - friendly and hostile - announced and completed takeovers, without the percent acquired constraint and found similar results. These results are omitted in the interests of space and are available from the authors.

holder exists at the end of the previous year and 0 otherwise. Finally, we also include industry dummies (not reported).

Thus, the probability of becoming a target in year t is estimated by using one-year-lagged values of the independent variables. Table I shows the test results for the total sample in the time period 1981-2004. Consistent with prior literature, the variables statistically significant in the whole sample panel are BLOCK, the industry dummy variable intended to capture the clustering of takeover activity within industry and time, market to book (Q), and firm size. Also consistent with the notion that higher leverage and lower cash are takeover deterrents, we find that higher leverage and lower cash reduces the likelihood of being acquired. These effects, however, are not statistically significant. In the next section, these estimated coefficients are used to sort firms into portfolios based on the likelihood of being a takeover target.

Before proceeding, we also redo the above test but now with the sample used in earlier governance studies that document a link between governance and abnormal returns (see, e.g., Gompers, Ishii and Metrick (2003) and Cremers and Nair (2005)). This will allow us to investigate the abnormal returns associated with the governance-spread portfolios in section 5. Data requirements limit this sample to firms in the S&P 500, mid-cap 400 and small-cap 600 indices between 1990 and 2003. This reduces the number of realized targets to 367 firms. The results from this model can be different from the previous model not only because of differences in the time-period but also because this sample consists of relatively larger firms. Thus we redo the logit to detect takeover likelihoods within this smaller sample.

For this smaller sample, we then introduce two more independent variables that are not available before 1990. The first captures the amount of takeover protection a firm has and is denoted by EXT. EXT is a linear transformation of the index constructed by Gompers, Ishii and Metrick (2003), such that a higher value of EXT (=24-G) indicates greater takeover exposure. We also use a variable to capture the complementary effect between takeover defenses and blockholdings identified in Cremers and Nair (2005). As the results indicate, EXT is significant in predicting takeovers. The complementary effect, while suggesting greater takeover vulnerability, is not statistically significant.

B. Returns to Portfolios based on Takeover Vulnerability

We now sort firms into portfolios based on their takeover vulnerability. To do this, we use the coefficients estimated in the logit regression. We form five portfolios with an equal number of firms in each portfolio. As is expected from the preceding section, firms with a blockholder, low Q and low market capitalization, and operating in an industry where a takeover occurred the previous year tend to appear in the portfolio that has the highest exposure to takeovers. However, it is important to note that any one of the firm characteristics alone does not dictate the portfolio that a firm belongs to.[13]

It is also useful to note that we have not have captured any possible interactive effects. For example, if characterisitcs such as leverage, cash, asset structure, ROA matter more for smaller firms than for larger firms, the specified model would not correctly capture such effects. Further, the takeover deterrent effects of size might not be linear. It might be unlikely to acquire a firm beyond a particular size, even if other characteristics favor a takeover. Rather than introduce new interactions and non-linearities in the logit model, we instead focus on the equal-weighted returns for the remainder of the paper in an attempt to reduce the noise inherent in predicting takeover targets.[14]

We investigate the returns of each of the five portfolios differing in their takeover vulnerability as well as the returns to a portfolio that buys firms with the highest takeover vulnerability

[13] Let us, for the sake of illustration, focus on market capitalization. A low market capitalization firm might have a high ROA, high Q, lack a blockholder, low fixed assets and operate in an industry that hasn't recently witnessed an acquisition. Such a firm will not appear in the portfolio with the highest exposure to takeovers. Similarly, a firm with high market cap might appear in the portfolio with the highest takeover exposure if the firm has a blockholder, low ROA and low Q, high fixed assets and is in an industry that has recently witnessed an acquisition.

[14] The value weighted results are similar, but weaker, and in some cross-sectional regressions (see section 4) not significant.

and shorts firms with the lowest takeover vulnerability. For additional robustness, we also investigate the returns to a takeover-spread portfolio that is formed based on decile, rather than quintile, classifications. The returns to these two sets of portfolios are adjusted for factors that may affect risk or style by using the market factor augmented by the size and book-to-market factors proposed by Fama and French (1993) as well as the Carhart (1997) momentum factor. Thus, we investigate if the takeover-spread portfolio is associated with a significant abnormal return relative to the Fama-French four factor model.

The theoretical framework presented in section II suggests two possibilities. If the factors in the four factor Fama-French model capture the risk associated with the risk-premia related state variables, we would not expect to find a significant abnormal return to the takeover-spread portfolio. In such a scenario, a portfolio of firms more likely to be taken over would only have a higher loading (beta) on the factor that captures the risk-premia related state variables. If, however, the four factor Fama-French model does not account for such risk-premia related state variables, we should find a significant and *positive* abnormal return to the takeover-spread portfolio.

In Table II (Panel A), we report the annualized abnormal returns associated with the takeover-spread portfolios. We find that the mean returns and the abnormal returns are generally increasing with the likelihood of takeovers. An equal-weighted portfolio that buys firms with high takeover vulnerability (5) and shorts firms with low takeover vulnerability (1) generates a highly significant annualized abnormal return of 11.43% between 1980 and 2004, with a t-statistic of 7.00. Using decile calssifications, the abnormal returns to such a takeover-spread portfolio is now even more striking and is equal to 17.66% with a t-statistic of 7.81.[15] The corresponding numbers for the value weighted portfolio are, as expected, lower and equal to 4.17% (t-stat of 2.33), for quintile classifications and 8.22% (t-stat of 2.95) for the decile classifications.

[15] These abnormal returns are not caused by the announcement returns to realized targets, as discussed in section 6.

Panel B reports the results for the sample between 1991 and 2004 and uses the logit model that includes takeover defenses. Again, we find that abnormal returns increase with takeover vulnerability and that the takeover-spread portfolio generates an annualized abnormal return of 6.69% (t-statistic of 3.08) for the quintile classification and 7.30% (t-statistic of 2.41) for the decile classification.

The results in this section are thus consistent with the notion that a takeover-spread portfolio captures the risk associated with risk-premia related state variables and that the four factor Fama-French model does not account for such risk.

IV. The 'TAKEOVER' Factor

In this section we investigate whether takeover-spread portfolios, as suggested by the framework, are important in explaining the cross-section of equity returns. We use the takeover-spread portfolio to mimick the state variables related to time varying risk premia and term this the 'TAKEOVER' factor. The proposed takeover factor is thus a long-short portfolio that buys firms in the highest quintile and sells firms in the lowest quintile of takeover vulnerability, utilizing differences in firm specific characteristics that affect the exposure to takeovers.

A. Methodology

In cross-sectional tests between 1980 and 2004, we investigate if the TAKEOVER factor is priced in addition to the market, size (SMB), book-to-market (HML) and momentum factors that together form the empirically successful four-factor model (Fama and French, 1992 and Carhart, 1997). To facilitate comparison with prior research, we subject the model to the test portfolios designed by Fama and French (1992) and subsequently analyzed by Jagannathan and Wang (1996) (henceforth, JW), Hodrick and Zhang (2002), Ang et. al. (2004), among several others.

The main econometric approach we use is the two-stage cross-sectional regression (CSR). In the first stage, the multivariate betas are estimated using ordinary least squares (OLS). The second stage is a single CSR of average excess returns on betas, estimated with generalized least squares (GLS). While the use of GLS for the second stage provides improved asymptotic efficiency (Shanken, 1992) and robustness to proxy misspecification (Kandel and Stambaugh, 1995), it requires the inverse of the unknown covariance matrix of returns. Following Shanken (1992), in the second stage the standard errors are corrected for the bias induced by OLS sampling errors in the first-stage betas. We use this two-stage cross-sectional regression to test whether the takeover factor can explain differences in the cross-section of returns, i.e., whether there exists a positive and significant coefficient on the takeover betas in the second stage regression.

In addition, we test our econometric specification using the Hansen and Jagannathan (1997) distance (HJ-distance) and the J-GMM tests (see, e.g., Cochrane, 2002). Hansen and Jagannathan (1997), who develop a distance metric we call the HJ-distance, demonstrate how to measure the distance between a true pricing kernel (stochastic discount factor) that prices all assets, and the implied pricing kernel proxy of an asset pricing model. The distance between these two random variables is calculated in the usual way as the square root of the expected value of the squared difference between the two variables. If the model is correct, the HJ-distance should not be significantly different from zero. We test whether HJ-distance equals zero using the statistical test developed in Jagannathan and Wang (1996). The estimates of HJ-distance are labeled HJ-dist . The asymptotic and empirical p-values (see Hodrick and Zhang, 2002) of the test HJ-dist $= 0$, are also reported below the HJ-distance.[16]

[16] The p-values of the J-statistics from optimal GMM estimates of the models are not reported here, but exhibit a pattern similar to the HJ statistics.

B. Results

Table III presents the correlation matrix of the factors used to explain the cross-section of equity returns (Panel A) as well as of the betas on these factors (Panel B).[17] A few observations can be made at this point. First, the correlations among the SMB, HML and TAKEOVER factors are fairly high. Of particular interest is the positive correlation between HML and TAKEOVER (69.93%) and between the betas on these factors (47.87%). This may raise two concerns – that any detected importance of the TAKEOVER factor might be spuriously due to this correlation, or that a cross-section based on book-to-market will handicap the takeover factor relative to the book-to-market factor. To alleviate such concerns, we will investigate the performance of the TAKEOVER factor in the cross-sectional regressions when the HML factor is excluded. As an additional robustness test, we also form an alternative set of test portfolios based on takeover vulnerabilities.

We first focus on the 100 portfolios based on decile sorts of book-to-market and size and report the importance of the TAKEOVER factor in various specifications. Our main results, the annualized coefficients from the second stage cross-sectional regression, are presented in Table IV (Panel A) using the 100 portfolios based on book-to-market and size, for which we consider the importance of the TAKEOVER factor in various specifications. Next, in Table IV (Panel B), we report pricing tests using alternative test portfolios such as 100 portfolios based on estimated takeover vulnerabilities.[18]

Table IV (Panel A) presents the cross-sectional pricing results for several different models using test portfolios based on 100 (10×10) size and book-to-market portfolios. The first model is the benchmark four-factor Fama-French(1992)-Carhart(1997) model. As is well

[17] Since the betas are from a multivariate regression, these betas are specific to the asset pricing model employed. The beta correlation matrix reported here is for the model including all five factors and using the 100 book-to-market and size sorted portfolios.

[18] We also use 25 portfolios instead of 100 based on these characteristics. The results are statistically significant in 3 out the 4 models. For the 25 book-to-market/size portfolios, with the Fama-French 4 factor model, the takeover factor is not significant, perhaps due to lack of variability that is not explained by the HML factor.

known, the Fama-French factors are priced and the model generates a R-square of 10.50%.[19] We add to this model the proposed TAKEOVER factor (Model 2). Consistent with theory, we find that the TAKEOVER factor is important in explaining cross-sectional differences in equity returns. The annual risk premium associated with this factor is rather high and equal to 9.00%. It is however useful to note that the average beta on this factor is 0.05. Thus, the average risk premium associated with this factor is much lower and is equal to 0.45%. It is also striking that the R-square of the regression is now 41.93%.

To ensure that our results are not driven by the correlations of the TAKEOVER factor with the other factors, especially with the book-to-market (HML) factor, we test an additional model. Model 4 considers a two-factor model including only the market portfolio and the TAKEOVER factor. As found earlier, the coefficient on the TAKEOVER factor is positive and significant, and the associated annual risk premium remains similar. Notably, the simple two factor model with the market and the TAKEOVER factor still generates a R-square of 19.38%.

C. Alternative Test Portfolios

The earlier results show that the TAKEOVER factor is important in explaining the cross-section of the returns even when the cross-section is formed based on book-to-market and the model includes the book-to-market factor. To ensure that the importance of the TAKEOVER factor is robust, we investigate its performance in explaining the returns to 100 portfolios based on estimated takeover vulnerabilities. Since the cross-section is thus not based on book-to-market characteristics, this will also address concerns that arise from the correlation between book-to-market and the TAKEOVER factors. The results from this exercise are reported in Table IV (Panel B). We report results for four models. The first uses only the four-factor model while the second adds the TAKEOVER factors to this. The third model is a simple market

[19]The computed R-squares are GLS R-squares without a constant. In a forthcoming version, we will report results with a constant as well.

model and the fourth appends the market model with the TAKEOVER factor. In both cases (model 2 and 4), the TAKEOVER factor is important in explaining cross-sectional differences in equity returns. The annualized risk premium associated with the TAKEOVER factor is around 5%.

Finally, and importantly, for all models and both sets of test portfolios, the HJ-distance decreases with the TAKEOVER factor. Therefore, the addition of the TAKEOVER factor improves the pricing performance, particularly in the case for the 100 takeover-sorted portfolios. Here, the HJ-distance has an asymptotic p-value (under the null of exact multifactor efficiency) of 51.80% for the four-factor model and 94.30% once the takeover factor is added. [20]

We have shown that an economically motivated portfolio constructed to capture differences in takeover exposure is important in explaining the cross-section of equity returns. The increase in R-squares, relative to existing models that are empirically successful, is remarkably large and shows the importance of accounting for the state variables related to a time-varying risk premium. These results show that it is important for asset pricing models to take such state variables into account, for example through the use of the takeover-spread portfolios presented here.

V. Impact on Abnormal Returns associated with Governance

In this section, we examine the findings in Gompers, Ishii and Metrick (2003) and Cremers and Nair (2005). These papers investigate the impact of corporate governance on firm value using valuation measures (Qs), accounting measures of profitability and equity returns. With regards to equity returns, Gompers, Ishii and Metrick (2003, henceforth GIM) compile a gov-

[20] We also compute the empirical p-values assuming normality as in Hodrick and Zhang (2000) using Monte Carlo simulations under each model holding exactly. Ahn and Gadarowski (1999) indicate that the small sample properties of the HJ-distance can be quite far from the asymptotic distribution and depend on the number of assets and the number of time periods. These p-values indicate a similar pattern.

ernance index (G) and document that firms with lower takeover defenses have higher abnormal returns relative to a Fama-French model. Cremers and Nair (2005, henceforth CN) show that the positive abnormal return accruing to firms with low level of charter protection (low G) exists only, and is larger, if the lack of takeover defenses is combined with a large external shareholder.

The theoretical framework presented suggests that if the asset pricing model does not capture the exposure to state variables related to the risk premium, a portfolio of firms exposed to takeovers will be associated with positive and significant abnormal returns. Further, the results in the previous sections show that the TAKEOVER factor is important in explaining the cross section of returns. Thus, we investigate how the abnormal returns documented in GIM and CN change on using an asset pricing model that includes this TAKEOVER factor.

Following GIM, we use the 'G index' they compile ($< 0 < G < 24$), and first form a portfolio that buys firms with the lowest level of managerial protection ($G < 6$) and shorts firms with the highest level of managerial protection ($G > 13$). To characterize the lowest and the highest level, we use the same cutoff levels as GIM and the same terminology to call this the 'democracy-minus-dictatorship' portfolio. First, we consider the same time period as Gompers, Ishii and Metrick (2003) and compute the abnormal returns to the democracy-minus-dictatorship portfolio between 1990 and 1999 (Table V, Panel A). Consistent with the findings of GIM, we find that the democracy-minus-dictatorship portfolio is associated with an annualized abnormal return of 8.65% (t-statistic of 2.97) relative to an asset pricing model that uses market, size, book-to-market and momentum factors.[21]

We then investigate is these abnormal returns decrease if the asset pricing model includes the TAKEOVER factor. We focus on the sample used in GIM and CN and consequently estimate takeover vulnerabilities based on the corresponding logit. Since the variables used to form these governance portfolios are also used in the logit model, it is important to note that

[21] The abnormal returns are not exactly identical (a difference of 0.20%) due to differences in the construction of the momentum factor associated.

the logit model employed has several other characteristics and consequently, the correlation between the democracy minus dictatorship portfolio used by GIM and the TAKEOVER factor is only -11%.

The democracy-minus-dictatorship portfolio now generates a much lower abnormal return of 3.79% and is no longer significant (t-statistic of 1.13) when the four factor model is appended with the takeover-spread portfolio to capture the exposure to state variables related to time-varying risk-premia. The equal-weighted version of such a portfolio is associated with an abnormal return of 1.51% that is also insignificant at standard levels. This documented reduction in abnormal returns also follows when the time period considered is extended from 1999 to 2003 - decreasing from 4.40% (t-statistic of 1.65) to 2.65% (t-statistic of 0.92) for the value-weighted case and from 3.62% (t-statistic of 1.64) to -0.68% (t-statistic of -0.31) for the equal-weighted case. However, for the time period between 1990 and 2003, the abnormal returns, even without the TAKEOVER factor, are low.

One possible reason for a weakening of the GIM results on extending the time period from 1999 to 2003 is perhaps the reduction in takeover activity during this time period.[22] As suggested by the framework here, lower takeover activity would imply a smaller difference in the returns between firms exposed to and firms protected from takeovers. Another reason is provided by CN. They find that takeover defenses and shareholder monitoring are complements in being associated with equity abnormal returns and accounting performance. Further, they document the complementary effect to be stronger in smaller firms. Thus using only takeover defenses, through G, might be capturing only part of the true effect associated with governance. We now account for this complementarity between governance mechanisms.

To ensure robustness of the pattern that abnormal returns associated with corporate governance decrease when the takeover-spread factor is included in the asset pricing model, we check the changes in abnormal returns associated with the existence of both low takeover de-

[22]The reduction in these abnormal returns on extending the time period is also documented by Cremers and Nair (2005).

fenses and high shareholder monitoring (see CN) when the takeover-spread portfolio is added to the asset pricing model. We first compute the abnormal returns to a portfolio that buys firms with few takeover defenses and high shareholder monitoring and shorts firms with many takeover defenses and low shareholder monitoring. To proxy for shareholder monitoring, we follow Cremers and Nair (2005) and use two alternatives - the presence of an institutional blockholder (BLOCK) and public pension fund holdings (PP).[23] Without the TAKEOVER factor, the abnormal returns to this governance-spread portfolio from 1990 to 2003 is now 6.72% (using BLOCK). Consistent with CN, these abnormal returns are higher than the corresponding abnormal return of the democracy-minus-dictatorship portfolio. On introducing the takeover-spread portfolio to the Fama-French model, however, the documented abnormal returns to the complementary governance portfolios also decrease. The abnormal returns decrease from 6.72% (t-statistic of 1.86) to 2.04% (t-statistic of 0.53).

To summarize, we find that the abnormal returns associated with governance-spread portfolios decrease once the asset pricing model includes the takeover-spread portfolio. This finding has an important implication. First, these results suggest that the documented abnormal returns associated with governance are partly due to the mis-specification of the asset pricing model. As discussed in the introduction, this sheds light on the interpretation of the findings in GIM and CN. While this interpretation cautions against the use of these takeover-related abnormal returns to advocate stronger governance, it is also important to note that the other positive aspects of governance shown in these two papers, specifically with regards to fundamental accounting performance, is still significant.

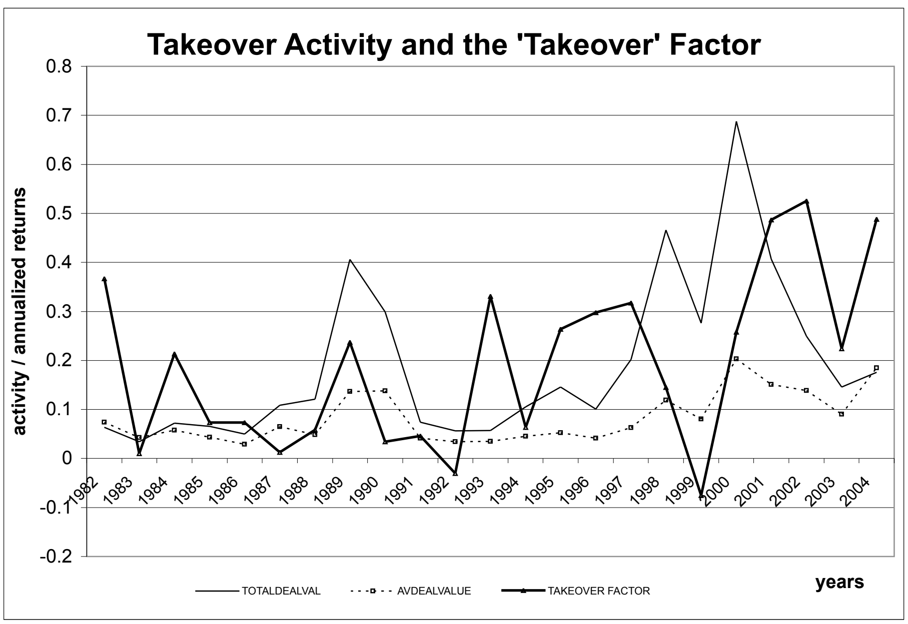
Consistent with proposition 1, we find that greater takeover vulnerability is associated with a higher rates of return. The proposition also states that takeover vulnerability increases firm values as well. Consistent evidence is provided in GIM and CN linking better takeover governance with higher Q ratios.

[23]Only results using BLOCK are reported.

VI. Extensions

As implied by the theoretical framework, we have seen that takeover-spread portfolios are important in explaining the cross-section of returns. To further support this argument, we plot the returns to the takeover-spread portfolio together with takeover activity (Figure 1). Takeover activity is measured each year, and takes into account all announced and completed takeovers. To summarize this annual takeover activity, we use the total deal value as well as the average deal value each year. To check whether the returns to this takeover-spread portfolio predicts takeover activity, we plot returns of the takeover-spread portfolio lagged by one year.

FIGURE 1



As the above figure indicates, the takeover factor indeed appears to predict takeover activity and thus appears related to real takeover activity in the economy. More formally, the correlation between lagged returns of the takeover factor and takeover activity is either 28%

or 31% depending on whether we use total deal value of average deal value to summarize takeover activity. As a final robustness check, we now address two concerns in the construction of the takeover-spread portfolio.

A. Takeover Factor and Out-of-Sample Takeover Likelihood

In the logit regressions used earlier to explain takeover activity, we use information on all realized takeovers between 1981 and 2004. As a result, the estimated coefficients rely on information until 2004. Consequently, the different takeover spread portfolios formed rely on future information, through the use of estimated logit coefficients to form categories of takeover likelihood. While there is no reason to expect such a bias will generate abnormal returns, we now conduct an alternative investigation to ensure that the results are not sensitive to such a bias.

Instead of estimating one logit regression, we now estimate the same model over rolling 10 year time periods. We begin by using the 1981-1990 time period. The coefficients estimated using this sample are then used to form the takeover-spread portfolio at the beginning of 1991. We then estimate the logit regression for 1982-1991 and use the estimated coefficients to form takeover spread portfolios for 1992. Proceeding similarly, we construct a takeover-spread portfolio between 1990 and 2004 that uses only past information. [24]

We redo the analysis in section III to investigate if a takeover-spread portfolio based on rolling estimation windows still generates abnormal returns relative to the four factor Fama-French model. As seen in Table VI (Panel A), the abnormal returns associated with the

[24]The use of the rolling logit specification with 10 year windows merits discussion. If the takeover environment changes, perhaps estimates based on the distant past are not relevant for takeovers in the next year. This motivates the use of the rolling estimation window. The number of years to be considered in each period is chosen to balance two effects. Utilizing only recent information and hence using short windows reduces the number of realized targets. This lack of observations makes it difficult to arrive at any robust estimations. On the other hand, increasing the period considered leaves us with fewer years to conduct our analysis on. For example, if we consider a 20 year rolling logit regression, we are left with only 4 years (2001-2004) for which we can compute abnormal returns and perform cross-sectional tests. To balance these counteracting concerns, we choose 10 years as the time period in each logit. This allows us to focus our analysis on the post-1990 period.

takeover-spread portfolio remains high and statistically significant. Using quintile sorts, the takeover-spread portfolio generates an annualized abnormal return of 11.78% between 1991 and 2004. The corresponding number when decile sorts are used is a striking 16.74%. While the takeover-spread portfolio results are consistent with the results in section III, it should be noted that the patterns among the five quintile portfolios are now more ambiguous. A possible reason might be that the out-of-sample logit regression is more noisy and detects extremes well but fails to correctly detect smaller changes of takeover vulnerability among firms.

Next, we consider the ability of the takeover-spread portfolio generated above to explain the cross section of returns. Following the methodology in Section 4, we report the coefficients in the second stage cross sectional regressions (Table VI, Panel B). For the period 1991-2004, the takeover spread portfolio using the rolling logit regression is important in explaining the returns of the 100 book-to-market and size sorted portfolios. Interestingly, in these regressions the size, book-to-market and the momentum factors are not statistically significant. This could be due to the now smaller number of observations (=14 X 12 monthly returns) used to estimate the betas in the first stage of the cross-sectional returns or due to the lower importance of these factors post 1990.

In sum then, the results reported in earlier sections is generally robust to the use of a methodology that utilizes only past information to form takeover-spread portfolios. One final issue is whether the documented abnormal returns are caused due to the abnormal announcement returns to targets of realized takeovers. If true, this would shed light on the source of these abnormal returns. However, this would not explain the importance of the takeover spread portfolio in explaining the cross section of equity returns. To investigate the merit of this alternative view, we remove from our initial sample all firms that were targets between 1980 and 2004 and compute abnormal returns accruing to the different portfolios discussed in section II. Our results remain consistent and of a surprisingly similar magnitude.[25]

[25] Results are not reported in the interests of space.

VII. Conclusion

This paper considers the impact of the takeover likelihood on firm valuation. While takeovers provide profitable exit opportunities for the target shareholders, takeover activity responds to investor expectations of future rates of return - when the expected future rate of return is low, firms tend to acquire. We argue that the price difference between firms due to differences in takeover vulnerability is related to expectations of takeover activity and hence to state variables related to the time variation in the risk premium. Thus, although these state variables are unobservable, they can be proxied by the difference in returns between firms exposed to takeovers and those protected from takeovers. We theoretically show that firms with greater exposure to takeovers will have a higher required rate of return and at the same time a higher firm value than firms with lower exposure to takeovers.

We document four sets of supporting results. First, we show that a portfolio that buys firms with a high takeover vulnerability and shorts firms with a low takeover vulnerability is associated with annualized abnormal returns of 11.35% relative to the four-factor Fama-French (1992) model augmented with the momentum factor (Carhart, 1997) model between 1980 and 2004. Second, we use the returns to the takeover-spread portfolio to propose a 'TAKEOVER' factor and show that the TAKEOVER factor explains differences in cross-sectional equity returns and improves substantially on the Fama-French four factor model. Third, we show that abnormal returns associated with governance-spread portfolios (Gompers, Ishii, and Metrick, 2003 and Cremers and Nair, 2005) decrease significantly once the asset pricing model includes the 'TAKEOVER' factor in addition to the Fama-French factors and the momentum factor. Fourth and finally, the returns to the takeover-spread portfolio formed predicts real takeover activity.

The paper contributes to two different areas of research. First, the paper contributes to the development of an asset pricing model that captures state variable(s) related to a time-varying risk premium. The second contribution deals with the importance of corporate governance.

Many advocates of governance have cited the positive abnormal returns associated with better governance to promote governance reform. While the conclusion that governance is associated with better firm performance might still be correct, the paper warns against the use of these abnormal returns as supporting evidence.

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Table I
Takeover Vulnerability: The Likelihood Of Being Acquired

This table presents results of the maximum likelihood estimates of the logit model for the Compustat based sample for the sample period 1980-2004 and for the sample covered by the Investor Responsibility Research Center (IRRC) for 1991-2004. The dependent variable is a dummy (Target) equal to one if the company is target of a completed friendly acquisition where the percentage acquired is 100%. ‘Q’ is the ratio of market to book value of assets, where market assets are defined as total assets plus market value of common stock minus book common equity and differed taxes. ‘PPE’ is property, plant and equipment to assets ratio. ‘Industry’ is equal one if, based on the Fama-French 48 industry classifications, there was a takeover in a firms industry in the year prior to the year of observation. ‘ROA’ is the return on assets. ‘Leverage’ is book debt to asset ratio. ‘Cash’ is cash and short-term investments to assets ratio. Firm size is proxied by ‘Ln(MKTCAP)’, the natural logarithm of the market equity. All independent variables are measure at the end of the fiscal year previous to the takeover event. Institutional Blockholder is a dummy variable assigned the value one if at least one institutional investor holds more than 5% of the companies stock and zero otherwise. ‘EXT’ is (24-G), where G is governance index as defined by Gompers, Ishii and Metrick (2001) and is available only after 1990. The point estimates and Wald chi-square statistics for the industry effects are not reported through they are included in the regression.

	Takeover Likelihood, 1980-2004			Takeover Likelihood, 1991-2004		
Variable	Coefficient	Std. Error	Significance	Coefficient	Std. Error	Significance
Q	-0.050	0.010	***	-0.25	0.052	***
PPE	0.004	0.046		0.324	0.175	*
Ln(CASH)	0.0168	0.0153		0.053	0.045	
BLOCK	0.586	0.046	***	-0.442	0.666	
Ln(MKTCAP)	-0.051	0.018	***	-0.015	0.055	
Industry	0.232	0.083	***	0.162	0.238	
Leverage	-0.0428	0.101		0.156	0.290	
ROA	-0.004	0.041		-0.122	0.239	
EXT				0.098	0.031	***
EXT*BLOCK				0.045	0.033	
Observations			81346			14965
Targets			2406			367

Table II
Importance of Takeover Vulnerability: Using cash-adjusted-leverage(CAL)

We report the annualized mean, the annualized abnormal return (alpha), and the corresponding t-statistic of five equal-weighted portfolios that differ in their takeover vulnerabilities. To sort firms into these portfolios based on their takeover vulnerability, we use the coefficients estimated in Table 1. Panel A reports the results for the entire COMPUSTAT sample for the years 1980-2004, while panel B reports the results for the Investor Research Responsibility Center (IRRC) sample between years 1991 and 2004. We also report the annualized mean, the annualized abnormal return (alpha), and the corresponding t-statistic of a portfolio that buys firms in the highest category and shorts firms in the lowest category of takeover vulnerability based on five ('5-1') and ten ('10-1') categories of takeover vulnerabilities. The alphas are relative to the four-factor Fama-French (1992)-Carhart (1997) model.

Panel A: Portfolios based on different levels of takeover likelihood, 1980-2004			
Mean	Alpha	t-stat	Takeover-Likelihood
1.81%	-3.91%	-3.40	1
7.00%	3.01%	1.84	2
12.15%	6.80%	4.25	3
12.77%	4.05%	3.24	4
13.23%	7.43%	4.85	5
11.43%	11.35%	7.00	5-1
16.38%	17.66%	7.81	10-1

Panel B: Portfolios based on different levels of takeover likelihood, 1991-2004			
Mean	Alpha	t-stat	Takeover-Likelihood
13.30%	1.57%	1.05	1
14.48%	1.14%	0.69	2
17.32%	3.29%	1.88	3
20.10%	6.18%	2.94	4
23.26%	8.25%	4.20	5
9.96%	6.69%	3.08	5-1
11.90%	7.30%	2.41	10-1

Table III
Time-series correlation matrix of factors

The table provides the correlation among the factors used to explain cross-sectional equity returns (Panel A) and the correlation between the multi-variate betas on these factors for the 100 size and book-to-market sorted portfolios (Panel B). The factors considered are the four factors in the Carhart (1997) model that includes the market, size (SMB), book-to-market (HML) and momentum (UMD). The new factor introduced here is a takeover-spread portfolio (TAKEOVER). The takeover-spread portfolio buys firms with low likelihood of being taken over and shorts firms with low likelihood of being taken over between 1981 and 2004 (See Table II).

Panel A: Time series correlation of the factors

	Market	SMB	HML	UMD
Market	100.00%			
SMB	18.34%	100.00%		
HML	-53.07%	-47.10%	100.00%	
UMD	-22.83%	-6.48%	11.38%	100.00%
TAKEOVER	-47.71%	-40.74%	69.93%	1.30%

Panel B: Correlation Matrix of the multivariate betas

	Market	SMB	HML	UMD
Market	100.00%			
SMB	-34.26%	100.00%		
HML	35.79%	-3.02%	100.00%	
UMD	-29.64%	-8.60%	-14.97%	100.00%
TAKEOVER	16.99%	8.63%	47.87%	7.27%

Table IV
Cross sectional pricing using the 'Takeover' Factor

We report the results for various cross-sectional GLS regressions of mean excess returns of the 100 BM/size-sorted test portfolios (Panel A) and of the 100 takeover-likelihood sorted portfolios (Panel B) regressed on their factor-betas. The multivariate factor-betas are estimated in a time series regression of each test portfolio on a constant and the particular factor, in the time period of 1981:4 - 2004:12. For the cross-sectional regressions, we report the coefficients and their t-statistics in parentheses - where standard errors are adjusted for the estimation risk in the betas (see Shapiro (2002)) - as well as the R2. The included factors are the market (VW CRSP index), SMB (small-minus-big market capitalization long-short portfolio), HML (high-minus-low BM), Mom (one year momentum Carhart portfolio) and two takeover-factors. Each takeover-spread portfolio buys firms in the highest quintile of takeover vulnerability and shorts firms in the lowest quintile (see Table II) of takeover vulnerability.

Panel A: Using 100 book-to-market and size sorted portfolios

	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. FF4	0.07	0.02	0.05	0.16		10.50%	0.69
	2.26	0.80	2.02	3.31			0.30%
2. FF4 + TAKEOVER	0.07	0.02	0.05	.14	0.09	41.93%	0.57
	2.18	0.78	2.01	2.94	3.72		50.00%
3. CAPM	0.07					-5.12%	0.76
	2.23						0.00%
4. CAPM + TAKEOVER	0.07				0.09	19.38%	0.66
2-factor model	2.17				3.92		4.50%

Panel B: Using 100 takeover likelihood sorted portfolios

	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. FF4	0.07	0.04	-0.00	-0.06		-11.44%	0.57
	2.10	1.45	-0.12	-1.25			51.80%
2. FF4 + TAKEOVER	0.07	0.03	-0.00	-0.05	0.04	7.85%	0.51
	2.16	1.20	-0.21	-0.93	1.86		94.30%
3. CAPM	0.07					16.57%	0.60
	2.18						0.00%
4. CAPM + TAKEOVER	0.07				0.05	15.05%	0.54
2-factor model	2.20				2.02		85.10%

Table V
Abnormal Returns associated with Governance Spread Portfolios

We report the annualized mean, the annualized abnormal return (alpha), and the corresponding t-statistic of a (value-weighted, VW, and equal-weighted, EW) portfolio that buys firms in the highest category of governance and shorts firms in the lowest category of governance. Governance is measured using G, the index compiled by Gompers, Ishii and Metrick, and by a combination of G and blockholding (BLOCK) (see Cremers and Nair, 2005). The alphas are first computed relative to the four-factor Carhart (1997) model and then relative to a five-factor model that appends the Carhart Model with a takeover-spread portfolio. The takeover-spread portfolio buys firms in the highest category and shorts firms in the lowest cateogry of takeover vulnerability (see table II).

Panel A:Democracy-Dictatorship Long-Short Portfolios, 1990:9 - 1999:12, VW		
	FF4	FF4+TAKEOVER
VW Alpha	8.65%	3.79%
t-stat	2.97	1.13
EW-Alpha	4.70%	1.51%
t-stat	2.00	0.55

Panel B:Democracy-Dictatorship Long-Short Portfolios, 1990:9 - 2004:12, VW		
	FF4	FF4+TAKEOVER
VW-Alpha	4.40%	2.65%
t-stat	1.65	0.92
EW-Alpha	3.62%	-0.68%
t-stat	1.64	-0.31

Panel C: Democracy-Dictatorship conditional on BLOCK Long-Short Portfolios, 1990:9 - 2004:12, EW		
	FF4	FF4+TAKEOVER
VW-Alpha, BLOCK=4	6.72%	2.04%
t-stat	1.86	0.53
EW-Alpha, BLOCK=4	4.68%	0.79%
t-stat	1.83	0.29

Table VI
Robustness: Using Rolling Logits to construct a 'Takeover' Factor

As in Table II and Table IV, we report the abnormal returns associated with takeover spread portfolios and the importance of the TAKEOVER factor in explaining the cross-section of returns, but now using takeover-spread portfolios that are based on a rolling logit regression. Estimates of a logit regression that fits takeover activity in the previous 10 years are used to form takeover-spread portfolios the following year. For a description of the independent variables used, see Table I. In Panel A, we report the annualized mean, the annualized abnormal return (alpha), and the corresponding t-statistic of five equal-weighted portfolios that differ in their takeover vulnerabilities, for the entire COMPUSTAT sample between 1991 and 2004. We also report, in panel A, the annualized mean, the annualized abnormal return (alpha), and the corresponding t-statistic of a portfolio that buys firms in the highest category and shorts firms in the lowest category of takeover vulnerability based on five ('5-1') and ten ('10-1') categories of takeover vulnerabilities. The alphas are relative to the four-factor Fama-French (1992)-Carhart (1997) model. In Panel B, we report the results for various cross-sectional GLS regressions of mean excess returns of the 100 BM/size-sorted test portfolios regressed on their factor-betas (see Table IV for details on the cross-sectional regressions).

Panel A: Takeover-Spread Portfolios, 1991-2004

Mean	Alpha	t-stat	Takeover-Likelihood
11.78%	10.61%	3.86	5-1
16.74%	16.58%	4.27	10-1
7.96%	-1.96%	-0.79	1
20.39%	1.24%	4.49	2
16.21%	4.86%	2.40	3
14.98%	1.53%	1.04	4
19.74%	8.65%	4.05	5

Panel B: Using 100 book-to-market and size sorted portfolios

Takeover-Factor	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. N/A	0.08	0.04	0.04	0.08		4.95%	0.79
	2.06	1.06	1.16	1.15			23.80%
2. TAKEOVER	0.08	0.04	0.04	.08	0.14	8.82%	0.72
	2.06	1.11	1.15	1.17	3.50		67.30%
3. N/A (CAPM)	0.08					-5.51%	0.84
	2.05						7.20%
4. TAKEOVER	0.08				0.13	-10.10%	0.76
2-factor model	2.05				3.30		45.00%