Takeovers and The Cross-Section of Returns

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ABSTRACT

This paper considers the impact of takeover (or acquisition) likelihood on firm valuation. If firms are more likely to acquire during times when they have free cash and/or when the required rate of return is low, takeover targets become more sensitive to shocks to aggregate cash flows and/or to the price of risk. Thus, ceteris paribus, firms that are exposed to takeovers will have a different rate of return from firms that are protected from takeovers. Using estimates of the likelihood that a firm will be acquired, we create a takeover-spread portfolio that buys firms with a high likelihood of being acquired and shorts firms with low likelihood of being acquired. Relative to the Fama-French model, the takeover-spread portfolio generates annualized abnormal returns of up to 12% between 1980 and 2004. Further, the takeover-spread portfolio is shown to be important in explaining cross-sectional differences in equity returns. Additionally, using a two-beta model that distinguishes cash flow shocks from discount rate shocks, we show that firms more likely to be taken over have higher betas on the aggregate cash factor. 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), and relate the takeover-spread portfolio returns to takeover activity in the economy.

I. Introduction

This paper considers the impact of the takeover channel on valuation. This investigation is motivated by the observation that takeover activity is time varying and related to the conditions in the equity market (see, e.g., Bruner (2004) and Rhodes-Kropf and Viswanathan (2005)). 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 observation above suggests that the likelihood of being taken over may not be purely idiosyncratic. Further, the likelihood of being taken over can have a potentially significant effect on firm valuations, as is evident from noting that the median bid premium (approximately 35%) and takeover activity (3,467 completed deals between 1980 and 1998) are both high (Mitchell and Stafford, 2003).[1]

An alternative motivation arises from the findings of papers that investigate the link between corporate governance and equity returns. Gompers, Ishii and Metrick (2003, 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 an institutional blockholder (or high public pension fund ownership).[2]

[1]There were 1,427 completed deals between 1980 and 1989 and 2,040 completed deals between 1990 and 1998. The median bid premium that targets received was 37.7% in the eighties and 34.5% in the nineties. Further, acquisition activity increased in 1999 and 2000 before dropping in 2001.

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

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 employed is incomplete and further still, that this 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 and firm valuation.

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, similar to the frameworks used in Campbell and Voulteenaho (2004) and Lettau and Wachter (2005), is that the price of risk varies over time and this variation is not perfectly related to changes in aggregate fundamentals. In this framework, we consider two alternative motivations for acquisition activity. The first motivation for acquisitions is driven through agency problems on the acquirer's part, that are exacerbated during times of positive cash flow shocks (the "agency" view). This causes firms exposed to takeovers to become more sensitive to such shocks in aggregate fundamentals. The second motivation for acquisitions is related to the valuation of potential synergies (the synergy view).[3] When the price of risk is low, the value of these synergies is high and firms tend to acquire, thereby increasing the sensitivity of potential targets to the changes in the price of risk.

Thus, regardless of the specific motivation, firms exposed to takeovers should differ in their exposure to state variables important for asset prices and hence in their expected rate of returns. Whether firms exposed to takeovers would have a higher, or a lower, rate of return would however depend on the relative importance of two acquisition motives. While the

[3]This is similar in spirit to the Q-theory of investments (Abel (1983) and see also 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.

'agency' view would unambiguously suggest that firms exposed to takeovers should have a higher rate of return, the implications from the 'synergy' view depend on the importance of the investor's inter-temporal hedging demands.[4] If such demands are important, then the 'synergy' view would suggest that firms exposed to takeovers should have a lower rate of return.

Next, we document five sets of results to shed light on these implications. 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 all state variables related to aggregate cashflows and/or time-varying risk premia.

Second, we use the returns to the takeover-spread portfolio to propose a 'TAKEOVER' factor. The TAKEOVER factor attempts to proxy for the risk due to changes in state variables that affect aggregate cash flows and/or time variation of risk premia. We find strong evidence that 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 as well.

Third, we show that the 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, we also show that the returns to the takeover-spread portfolio predict real takeover activity. Fifth and finally, using the two-beta model proposed by Campbell and Voulteenaho (2004), we show that firms exposed to takeover indeed have higher cash flow betas, suggesting that takeover

[4]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.

activity is indeed more likely to be related to changes in aggregate fundamentals rather than to independent changes in the price of risk.

The central idea in this paper - that firms differing in takeover exposure also differ in their exposure to state variables important for asset prices - 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. 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 correctly accounts for such time variation in investment opportunities.

The results in the paper indicate that the widely used Fama-French asset pricing model is not specified completely 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' factor. In Section 6, we investigate whether this TAKEOVER factor is associated with takeover activity in the economy. Section 7 provides some evidence on the differences between cash-flow and discount rate betas among firms that differ in their takeover exposure. Section 8 concludes.

II. Takeovers and Asset Prices

This section presents a simple framework to highlight the differences in valuation between firms that differ in their exposure to takeovers, but are otherwise identical.

A. Asset pricing

The asset pricing model we employ has two important features. First, the price of risk varies, implying that at some times investors require a greater return per unit of risk than at others and second, that this variation is not perfectly related to changes in aggregate fundamentals. A large and growing body of empirical work supports the view 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, z_t, that follows the process

$$z_{t+1} = z_t + \sigma_z \varepsilon_{z,t+1},$$

where ε_z is a shock to the price of risk and is distributed normally with zero mean and unit standard deviation.

We do not take a stand on the source of this state variable and consequently, do not take a stand on the relative merits between the various models that generate time-varying risk premia. However, we do assume that the shocks to z are not perfectly linked to variation in aggregate fundamentals. For simplicity, we assume that the shocks to z are independent of the variation in aggregate fundamentals.

We denote the log of the aggregate payout to stockholders in the economy at time t by d_t and use a simple model of payout growth that follows the process[5]

$$d_{t+1} = d_t + \sigma_d \varepsilon_{d,t+1}, \tag{1}$$

where ε_d is a shock to the payout growth and is distributed normally with zero mean and unit standard deviation.

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 return at time $t+k$ of $R_{i,t+k}$, the following equation holds

$$E_t[M_{t+k}R_{i,t+k}] = 1,$$

where E_t denotes the expectation conditional on information available at time t. Since a stochastic discount factor can be approximated by a Taylor expansion to a linear form, we can express the discount factor that captures the two mentioned sources of variation by $M = a + bZ - cD$, where Z is a factor capturing shocks in the price of risk and D is factor capturing dividend shocks.[6]

Thus, in such an economy, the price of a security that pays X_T at time T is

$$P(X_T) = E(M)E(X_T) + b * cov(Z_T, X_T) + c * cov(-D_T, X_T).$$

[5]This can be viewed as a simplified version of the dividend growth model used for example, by Campbell (1999), Bansal and Yaron (2004) and Lettau and Wachter (2005).

[6]Consider for illuatration, the Campbell-Cochrane (1999) model. Although variation in aggregate fundamentals and the price of risk are closely linked in Campbell and Cochrane (1999), the discount factor - 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 - is approximately equal to $M_{t,t+k} = 1 - \gamma\frac{S_{t+k}-S_t}{S_t} - \gamma\frac{C_{t+k}-C_t}{C_t}$.

Since investors would demand a higher return for stocks that pay off when aggregate fundamentals are high, the parameter ‘b’ would thus be negative. The parameter ‘c’ could however be different. In the absence of any intertemporal hedging concerns, investors would demand a higher return on stocks that pay off when current valuations are high. Thus, investors would demand a higher return on stocks whose returns covary negatively with the price of risk, implying that ‘c’ would also be negative. However, if intertemporal hedging concerns are important such stocks should also provide hedging benefits. Thus the price of risk on the discount rate would then be lower , implying a less negative or even positive ‘c’ (see Campbell and Vuolteenaho, 2004).

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. We categorize firms into potential acquirers and potential targets. All potential targets have identical final cash flows of X_T that, for simplicity, are realized without any uncertainty. However, they differ in the level of managerial entrenchment that changes the likelihood with which a takeover bid succeeds.[7] The parameter τ reflects the likelihood with which a takeover bid occurs and succeeds. A lower value of τ hence reflects greater managerial entrenchment in the target firm.[8]

At time $t+k<T$ an acquirer can attempt an acquisition that pays the target a premium of Δ over the stock price. The price of the potential targets at time t, is then simply

$$E[P_{t+k}+\tau\Delta]E[M_{t+k}]+cov(P_{t+k},M_{t+k})+cov(\tau\Delta,M_{t+k}). \qquad (2)$$

[7]Examples of managerial entrenchment devices include takeover defenses and leverage (Stulz (1988) and Harris and Raviv(1988)).

[8]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.

It is the covariance between the stochastic discount factor, M_{t+k}, and the premium, Δ, in the above expression that leads to differences in returns between firms that differ in their takeover exposure (τ). To the extent that takeovers only occur if the premium is above a threshold level, this captures the view that merger activity is related to stock market conditions. However, in our parsimonious model, we allow takeovers to occur regardless of the premium but instead focus on how the timing of the takeover premium varies. We now consider two alternative motives that drive acquisition activity and investigate their implications for returns of firms exposed to acquisitions.

C. Agency Problems

In this section, we consider how returns to takeover targets vary if acquisitions are driven by agency problems that emanate from the separation of ownership and control. In the spirit of Jensen (1986) and more recently Dow, Gorton and Krishnamurthy (2005), we characterize the agency problem by assuming that managers of acquirer firms do not pay out cash but instead use it to invest in acquisitions and other projects. These managers thus have 'empire building' tendencies and it is easier to pursue such acquisitions when the financial constraints the firm faces are low, or alternatively, when cash in the firm increases.[9]

The managers of potential targets, on the other hand, pay out cash. Thus, the channel through which shocks to firm's cash flows are transferred as shocks to the aggregate payout (dividends versus risk premia) depend on the fraction of acquirers in the economy. Since we have already characterized the payout growth process, the cash with acquirers at time $t+1$ is then

$$c_{t+1} = a\sigma_d \varepsilon_{d,t+1} \tag{3}$$

[9] Viewed literally, this motivation would only explain cash deals. However, managers can also use a combination of stock and cash, where it can be easier for the manager to pursue his private benefits when the cash component is higher. One could also incorporate stock deals in an alternative view in which stock issuance today for acquisition purposes leads to stronger financial constraints in the future. A manager with cash in hand would be less concerned of this cost.

where 'a' is the fraction of firms in the economy that are acquirers.

Since the cost of the acquisition decreases with cash, the premium the acquirer offers is then a function of the cash and is denoted by $\Delta(c_{t+1})$. Using this in (2), we get the following proposition.

Proposition 1 *Firms with greater exposure to takeovers have a higher expected rate of return due to higher exposure to factors related to aggregate fundamentals. At the same time, firms with a higher exposure to takeovers, ceteris paribus, also have a higher value.*

Proof: *The value of the firm that is exposed to takeovers can be written as*

$$E[P_{t+k}M_{t+k}] + E[\tau\Delta]E[M_{t+k}] + \tau * cov(\Delta, M_{t+k}),$$

whereas the value of the firm that is protected from takeovers equals

$$E[P_{t+k}M_{t+k}].$$

Since the takeover premium Δ is only a function of the shock to the acquirer's cash, the covariance between M_{t+k} and Δ is given by $c * cov(D_{t+k}, \Delta)$. Further, because the premium increases as shocks to cash increase, using (3) and (1), this covariance term is then positive. Thus, the expected return on firms is increasing with takeover vulnerability. Further, the higher return is only due to a higher beta on risk factors related to aggregate fundamentals. Also, $\tau * E[\Delta M_{t+k}] > 0$, so that, ceteribus paribus, takeover exposure is associated with a higher value.

D. Synergies

We now consider an alternative motivation for acquisitions that is driven through the potential to generate synergies. We assume that the acquirer can improve the target cash flows from X_T to $X_T(1+\delta)$. Here, δ 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.[10] Since the large body of evidence on share price reactions around takeover announcements suggests that on an average targets receive a positive premium while acquirer returns are insignificantly different from zero, we attribute all the synergies to the target.[11]

As the future cost of capital decreases, the present value of the expected synergies increases. Since the present value of synergies increase, the takeover premium that the acquirer can offer also increases. Thus the premium is a function of the future price of risk and is denoted by $\Delta(z_{t+k})$. Using this in (2), we get the following proposition.

Proposition 2 *If acquisition activity is driven through the valuation of future synergies, then firms with greater exposure to takeovers have a greater exposure to state-specific risk factors that affect time-varying risk premia. If intertemporal hedging demands are important, firms exposed to takeovers would then have a lower rate of return.*

Proof: *The value of the firm that is exposed to takeovers can be written as*

$$E[P_{t+k}M_{t+k}] + \tau * E[\Delta]E[M_{t+k}] + \tau * cov(\Delta, M_{t+k})$$

whereas the value of the firm protected from takeovers equals

$$E[P_{t+k}M_{t+k}]$$

Since the takeover premium is a function only of the shock to the price of risk, the covariance between M_{t+k} and Δ is given by $b * cov(-Z_{t+k}, \Delta)$. Because the premium increases as the price of risk decreases, this covariance term is then positive. Thus, for firm T, the exposure to Z is given by $b[cov(P_{t+k}, -Z_{t+k}) + \tau * cov(-Z_{t+k}, \Delta)]$ and is increasing with τ.

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

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

We have seen that takeover vulnerability can affect the rate of return on firms either positively or negatively, depending on the motives that drive acquisition activity. If agency motives are more important, we would expect to see higher expected returns to firms with greater takeover vulnerability. To investigate if this is the case and to shed light on the broader notion that a firm's takeover vulnerability affects the rate of return, we now turn to the data and use the four-factor asset pricing model proposed by Fama-French (1992) and Carhart (1997). Since our main focus is on the relation between governance and abnormal returns, we also use this benchmark model simply for 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 four-factor model.

A. Takeover Vulnerability

To estimate the likelihood that a firm will be acquired, we use a logit regression. We identify which firms are acquired each year from the Securities Data Corporation's (SDC) database. Because we want to focus on those targets where the premium received is likely to be significantly high, we only consider takeovers where 100% of the firm is acquired. Further, since takeovers can be friendly or hostile and takeover vulnerability to a friendly deal can be different from vulnerability to a hostile bidder, we separate friendly targets from all other targets. However, because the probability of completing a hostile takeover is low and incidences of hostile takeovers are themselves very infrequent, the loss of data by not considering only friendly takeovers is low.[12] We were able to find 4,979 such targets of friendly acquisitions, out of which 2,406 deals were completed between 1980 and 2004.[13]

Our first empirical 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 an acquisition target in that year, and zero otherwise. To define acquisition targets, we use both completed and announced deals (Table 1, Panel A) as well as only completed deals (Table 1, Panel B). 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)). These additional variables 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 a 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 as those institutional shareholders that have more than 5% ownership in the firm's outstanding shares. To construct this measure, we use data on institutional shareholdings from the Thompson / CDA Spectrum database, which collects quarterly information from SEC 13f filings. We then use a dummy variable, denoted by BLOCK, which takes the value of 1 when an institutional blockholder exists at the end of the previous year and 0 otherwise. Finally, we also include

[12]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%.

[13]The number is a conservative estimate of the takeover activity since it considers only friendly takeovers where the percent acquired is 100%. We also ran the logits without the percent acquired constraint and found similar results. Results are not reported in the interests of space and are available on request.

industry dummies (not reported). To conclude, the probability of becoming a target in year t is estimated by using one-year-lagged values of all 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 targets completely acquired in friendly deals 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 much smaller sample consists of only the relatively larger firms.

For this smaller sample, we 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 G index constructed by Gompers, Ishii and Metrick (2003), such that a higher value of EXT (=24-G) indicates greater takeover exposure. We cannot assume that everyone will be familiar with G. Please add a footnote here about the contents of G, straight out of CN. We also add the interaction of EXT and BLOCK 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, for which we use the coefficients estimated in the logit regression.[14] We form five portfolios with an equal number of firms in each portfolio. As 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 these firm characteristics alone does not determine the portfolio that a firm belongs to.[15]

It is also useful to note that we have not have captured possible interaction effects. For example, if characteristics such as leverage, cash, asset structure and 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. For example, it may 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 portfolio returns for the remainder of the paper in an attempt to reduce the noise inherent in predicting takeover targets.[16]

[14]To form these portfolios we used coefficients estimated from the logit that considers announced and completed takeovers (Table 1, Panel A). Results using the logit that considers only completed takeovers (Table 1, Panel B) were similar and are omitted.

[15]For example, 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.

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

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 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. Therefore, the abnormal returns of the takeover-spread portfolios reported are 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 all factors affecting the aggregate fundamentals and discount rates correctly, 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 different betas. However, if the four factor Fama-French model does not account for all such factors, then our model suggests we should find a significant abnormal return to the takeover-spread portfolio.[17]

In Table II (Panel A), we report the annualized abnormal returns associated with the takeover-spread portfolios. We find that both the mean and the abnormal returns are generally increasing with the likelihood of takeovers. An equal-weighted portfolio that buys firms in the highest quintile of takeover vulnerability and shorts firms in the lowest quintile of takeover vulnerability generates a highly significant annualized abnormal return of 11.43% between 1980 and 2004, with a t-statistic of 7.00. Using decile classifications, the abnormal returns to such a takeover-spread portfolio is even more striking and equals 17.66% with a t-statistic of 7.81.[18] The corresponding numbers for the value-weighted portfolios are, as expected, lower

[17]Since the market captures both shocks to aggregate fundamentals and to discount rates (Campbell and Vuolteenaho, 2004), it is reasonable to expect abnormal returns relative to a market model even when higher shocks to aggregate fundamentals are the only relevant channel.

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

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.

Panel B of Table II reports the results for the sample between 1991 and 2004, using the logit model that includes takeover defenses and its interaction with blockholding. 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 portfolios and 7.30% (t-statistic of 2.41) for the decile portfolios.

The results in this section are thus consistent with the notion that takeover vulnerability affects the rate of return and that the four factor Fama-French model does not account for such risk. Further, this evidence also appears to support acquisition motives that make takeover targets are more sensitive to aggregate fundamentals, rather than to discount rates, as the relationship between takeover vulnerability and expected returns is positive.

IV. The 'TAKEOVER' Factor

In this section we investigate whether takeover-spread portfolios are important in explaining the cross-section of equity returns, as suggested by framework. We use the quintile takeover-spread portfolio to mimic the state variables related to aggregate fundamentals and/or 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 improves asymptotic efficiency (Shanken, 1992) and increases the 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 implied by the 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 the HJ-distance are labeled HJ-dist. The asymptotic and empirical p-values (see e.g. Hodrick and Zhang, 2002) of the test HJ-dist $= 0$ are also reported below the HJ-distance.[19]

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).[20] 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 (52.11%).[21] 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 also 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.

For the cross-sectional regressions, we consider several different sets of test portfolios. We first focus on the 100 portfolios based on double decile sorts of book-to-market and size, with the results presented in Table IV, Panel A. Next, in Panel B of Table IV we report pricing tests using 100 portfolios sorted on estimated takeover vulnerabilities.[22]

Using the 100 size and book-to-market portfolios, our benchmark model is the four-factor Fama-French(1992)-Carhart(1997) model. As is well known, the Fama-French factors are

[19]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.

[20]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.

[21]Note, however, that the betas on these two factors have a relatively low correlation of 5.82%.

[22]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.

priced and the model generates an R-square of 14.54%.[23] 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 8.00%. However, it is useful to note that the average beta on this factor is only 0.05. Thus, the average annualized risk premium associated with this factor is much lower and equals 0.40%. It is also striking that adding the TAKEOVER factors vastly increases the R-square of the regression to 27.10%.

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 also consider a two-factor model including only the market portfolio and the TAKEOVER factor (Model 4). The coefficient on the TAKEOVER factor is again positive and highly significant, and the associated annualized risk premium remains similar. Notably, the simple two factor model with the market and the TAKEOVER factor still generates an R-square of 10.06%, compared to an R-square of 5.20% for the CAPM (Model 3).

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 size) and the model includes the book-to-market factor. To ensure that the importance of the TAKEOVER factor is robust, in this section 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 Panel B of Table IV. We report results for the same four models

[23] The significance of the takeover factor is robust in results without a constant and also in OLS regressions, which are available on request.

as in Panel A. In both models that include the TAKEOVER factor (Models 2 and 4), the TAKEOVER factor is important in explaining cross-sectional differences in equity returns.

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. [24]

These results indicate 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 price of risk and aggregate fundamentals, 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 governance 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.

[24] 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.

The theoretical framework presented suggests that if the asset pricing model does not capture the state variables related to the price of risk and to the aggregate fundamentals correctly, 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 when 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 (takeover) protection or the highest level of share holder rights ($G < 6$) 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.[25]

We then investigate whether 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. While the variables used to form these governance portfolios are also used in the logit model, it is important to note that the logit model employed has several other characteristics and consequently. In fact, the correlation between the democracy-minus-dictatorship portfolio used by GIM and the TAKEOVER factor is even negative and equals -11%.

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

Once the four factor model is appended with the takeover-spread portfolio, the democracy-minus-dictatorship portfolio generates a much lower annualized abnormal return of 3.79% and is no longer significant (t-statistic of 1.13). For example, the equal-weighted democracy-minus-dictatorship 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 (all annualized). 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.[26] 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 both equity abnormal returns and accounting performance. Further, they document the complementary effect to be stronger in smaller firms. Therefore, the use of takeover defenses, through G, alone might be capturing only part of the true effect associated with governance. Next, we account for this complementarity between these 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 defenses 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

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

takeover defenses and low shareholder monitoring. To proxy for shareholder monitoring, we follow CN and use two alternatives - the presence of an institutional blockholder (BLOCK) and the percentage of public pension fund holdings (PP).[27] Without the TAKEOVER factor, the annualized abnormal returns to this governance-spread portfolio from 1990 to 2003 is 6.72% with a t-statistic of 1.86 (using BLOCK). Consistent with CN, these abnormal returns are higher than the corresponding abnormal return of the democracy-minus-dictatorship portfolio. However, on introducing the takeover-spread portfolio to the four-factor benchmodel model, the documented annualized abnormal returns to the complementary governance portfolios also decrease 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 important implications for the interpretation of the findings in GIM and CN, suggesting that the governance abnormal returns are largely risk-related, and caused by using an incomplete asset pricing model. 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.

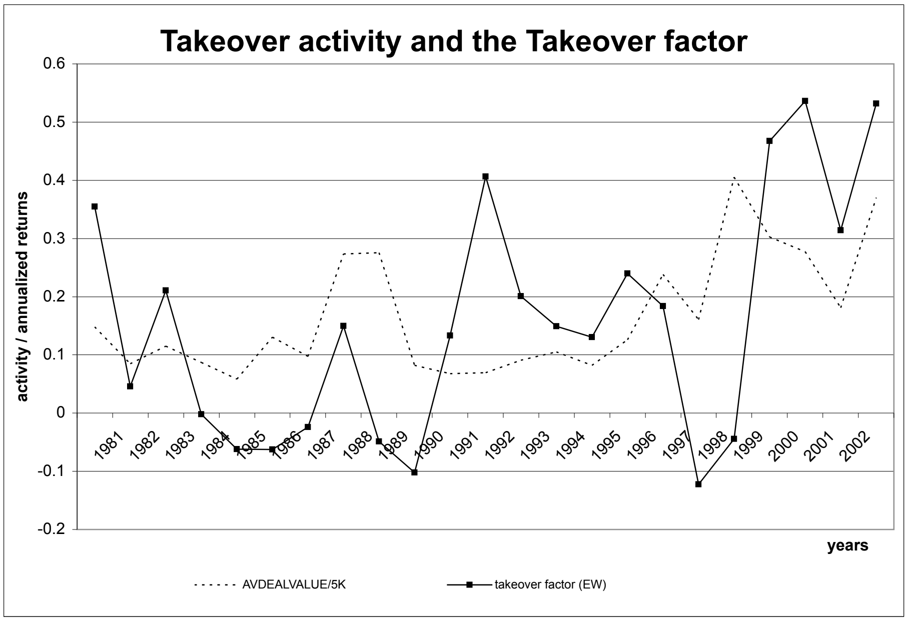
VI. Extensions

As implied by the theoretical framework, we have documented that takeover-spread portfolios are important in explaining the cross-section of returns. To ensure that the returns to the constructed takeover spread portfolios are indeed due to takeovers, 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

[27] Only results using BLOCK are reported.

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 or 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 and the annual sorts 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, beginning with 1981-1990. 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. [28]

We repeat 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 benchmark model. As seen in Table VI (Panel A), the abnormal returns associated with the takeover-spread portfolio remains high and statistically significant. Using quintile sorts, the takeover-spread portfolio generates an annualized abnormal return of 12.32% between 1991 and 2004. The corresponding number when decile sorts are used is a striking 16.64%. While the takeover-spread portfolio results are consistent with the results in section III, it should be

[28]The use of the rolling logit specification with 10 year windows could also be motivated by changes in the takeover environment across such, such that estimates based on the distant past may not be relevant for takeovers in the next year. 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, which makes it difficult to arrive at any robust estimations. On the other hand, a large estimation window 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.

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, our main results are 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 by the announcement returns to targets of realized takeovers. If so, this would shed light on the source of these abnormal returns, but 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 completely and ex-post remove from our initial sample all firms that were targets between 1980 and 2004 and with the reduced sample of firms compute abnormal returns accruing to the different portfolios discussed in section II. Consistent with the findings in Cremers and Nair (2005), our results remain consistent.[29]

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

VII. Aggregate Fundamentals Versus Discount Rates

The evidence presented in this paper supports the view that firms exposed to takeovers have a higher rate of return. The interpretation of this evidence, viewed through the theoretical framework presented here, would be that takeover targets are more sensitive to aggregate fundamental shocks, rather than to discount rate shocks. In this section, we attempt to directly shed light on this interpretation.

To separate the sensitivity to aggregate fundamental shocks from the sensitivity to discount rate shocks, we use the two-beta framework proposed by Campbell and Vuolteenaho (2004, henceforth CV). CV propose a two-beta model that captures a stock's risk in two risk loadings: the stock's cash-flow beta and it's discount-rate beta. These betas follow from a decomposition of the return on the market portfolio into two components, one reflecting news about the markets future cash flows and another reflecting news about the markets discount rates. A stocks cash-flow beta measures the stock's return covariance with the former component and its discount-rate beta its return covariance with the latter component.

We investigate if firms with higher takeover exposure exhibit a pattern of higher cash-flow betas. As before (in section III.B.), we sort firms into portfolios based on their takeover vulnerability using the coefficients estimated in the logit regression for the period 1981 to 2003 . We form five portfolios with an equal number of firms in each portfolio and estimate each portfolio's cash-flow and discount-rate betas. As seen in Table VII, the cash-flow betas exhibit the expected trend - higher takeover vulnerability is associated with higher cash-flow betas. On the other hand, discount rate betas exhibit a decreasing trend with greater takeover exposure. This evidence thus supports the view that takeover activity is high when aggregate cash flows are high. In fact, this view also sheds light on the observed trend in discount rate betas if takeovers decrease the horizon of the equity holding (Lettau and Wachter, 2005).

In any case, there is little evidence for the view that discount rate fluctuations, in isolation, motivate acquisition activity.[30]

It is natural to ask what fraction of the observed abnormal returns to the takeover spread portfolio can be explained by these changes in betas. The difference, significant at the 5% level, between the cash-flow betas of firm exposed to takeovers and protected from takeovers is 0.10. Similarly, the difference (again, significant at the 5% level) between the discount-rate betas of firm exposed to takeovers and protected from takeovers is -0.19. Using the risk premium estimates provided by CV, this could differences in expected returns of approximately 6.1% per year . While supporting the view presented in this paper, such a model thus does not completely explain the documented abnormal returns either.

This is perhaps not surprising; the model utilized here (CV) only splits the exposure to the market portfolio into exposure due to cash flow chocks and exposure due to discount rate shocks. Thus, the inability of this model to completely explain the documented takeover-spread alphas is not surprising if there exist factors, other than the market portfolio, in the asset pricing model. This, for example, could arise if the market portfolio is an incomplete proxy for the wealth portfolio. What these additional factors are and how they arise is however left beyond the scope of this paper.

VIII. Conclusion

This paper considers the impact of the takeover likelihood on firm valuation. Takeover activity responds to investor expectations of future rates of return - when the expected future rate of return is low, firms tend to acquire. As a result, 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. Therefore,

[30] If discount rate shocks and cash flow shocks are negatively, but not perfectly, correlated, it is important to consider the sensitivity of takeovers to each shock in isolation.

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 may have a higher required rate of return.

We document five 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 substantially improves the 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, the returns to the takeover-spread portfolio formed seem to predict real takeover activity. Fifth and finally, we provide some evidence that firms exposed to takeover indeed have greater sensitivity to aggregate fundamentals.

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 friendly acquisition. '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 (2003) 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
Panel A: Using announced and completed takeovers						
Q	-0.037	0.008	***	-0.059	0.023	***
PPE	0.015	0.030		0.123	0.129	
Ln(CASH)	0.003	0.010		0.030	0.031	
BLOCK	0.261	0.032	***	-0.687	0.390	*
Ln(MKTCAP)	-0.037	0.012	***	-0.107	0.039	***
Industry	0.072	0.053		0.081	0.142	
Leverage	0.095	0.025	***	0.806	0.177	***
ROA	-0.019	0.008	**	-0.432	0.123	***
EXT				0.052	0.018	***
EXT*BLOCK				0.032	0.019	*
Observations		83752			15332	
Targets		4979			734	
Panel B: Using 100% completed takeovers						
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		83752			15332	
Targets		2406			367	

Table II
Importance of Takeover Vulnerability

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
11.22%	-0.78%	-0.53	1
13.83%	0.98%	0.57	2
16.33%	2.36%	1.19	3
20.26%	6.57%	3.39	4
27.08%	11.53%	4.77	5
15.86%	12.30%	4.55	5-1
19.26%	13.61%	3.51	10-1

Table III
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	18.06%	100.00%		
HML	-53.04%	-42.10%	100.00%	
UMD	-14.44%	-8.54%	6.26%	100.00%
TAKEOVER	-38.42%	-3.58%	52.11%	-36.94%

Panel B: Correlation Matrix of the multivariate betas

	Market	SMB	HML	UMD
Market	100.00%			
SMB	-21.38%	100.00%		
HML	44.09%	-22.35%	100.00%	
UMD	-4.35%	9.17%	-3.55%	100.00%
TAKEOVER	12.95%	31.76%	5.82%	62.67%

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

	Constant	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. FF4	0.18	-0.10	0.02	0.05	0.11		14.54%	0.69
	8.36	-2.84	0.69	2.07	2.32			0.20%
2. FF4 + TAKEOVER	0.17	-0.09	0.02	0.05	0.12	0.08	27.10%	0.59
	7.06	-2.35	0.68	2.05	2.40	3.02		27.64%
3. CAPM	0.19	-0.12					5.20%	0.76
	9.84	-3.23						0.00%
4. CAPM + TAKEOVER	0.18	-0.11				0.07	10.06%	0.68
2-factor model	8.94	-2.96				2.89		0.94%

Panel B: Using 100 takeover likelihood sorted portfolios

	Constant	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. FF4	0.27	-0.22	0.00	0.18	-0.02		41.05%	0.64
	6.81	-4.52	0.03	6.19	-0.44			5.14%
2. FF4 + TAKEOVER	0.28	-0.22	0.00	0.19	-0.03	0.11	41.40%	0.61
	6.60	-4.41	0.07	5.88	-0.49	5.34		20.53%
3. CAPM	0.33	-0.25					26.19%	0.75
	8.99	-5.45						0.01%
4. CAPM + TAKEOVER	0.29	-0.21				0.11	36.11%	0.66
2-factor model	7.53	-4.52				5.34		2.91%

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		
	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		
	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		
	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
10.61%	12.32%	3.25	5-1
13.71%	16.64%	3.50	10-1
9.84%	-1.30%	-0.55	1
14.32%	2.42%	1.25	2
16.94%	6.26%	4.04	3
17.76%	7.04%	3.70	4
20.45%	11.02%	3.82	5

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

Takeover-Factor	Constant	Market	SMB	HML	Mom	TAKEOVER	R2	H-J statistic
1. N/A	0.16	-0.07	0.04	0.04	-0.00		11.06%	0.79
	8.29	-1.70	1.02	1.17	-0.04			25.40%
2. TAKEOVER	0.15	-0.07	0.04	0.04	-0.00	0.08	13.81%	0.72
	7.83	-1.59	1.02	1.18	-0.01	1.70		48.00%
3. N/A (CAPM)	0.16	-0.07					4.03%	0.84
	9.01	-1.74						6.00%
4. TAKEOVER	0.16	-0.07				0.08	8.73%	0.81
2-factor model	8.72	-1.67				1.76		16.20%

Table VII
Cash-Flow Betas and Takeover Vulnerability

The table shows the estimated discount-rate (DR) and cash flow (CF) betas for the takeover-likelihood sorted portfolios (see the text for a description of the betas, or see Campbell and Vuolteenaho (2004) for details). The time series used is 1981:1 - 2001:12. All estimated betas are significant at the 1% level and all differences are significant at the 5% level.

DR beta	CF beta	Takeover-Likelihood
1.35	-0.02	1
1.34	0.05	2
1.19	0.08	3
1.17	0.07	4
1.16	0.08	5
-0.19%	0.10	5-1
-0.23%	0.14	10-1