Takeovers, Governance and The Cross-Section of Returns

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ABSTRACT

This paper considers the impact of the takeover channel on firm valuation. We use the idea that takeover activity responds to investor expectations of future rate of return and hence to state variable(s) related to the time variation in risk premia. Thus firms with higher exposure to takeovers, due to higher expectations of receiving a takeover premium, have a higher exposure to the state variable that dictates time variation in risk premia. Consequently, the difference in the returns between firms that differ in their takeover vulnerabilities can be used to used to proxy these state variables. To do so, we create a takeover-spread portfolio that buys firms with low cash-adjusted-leverage (cheaper targets) and shorts firms with high cash-adjusted-leverage and show that such a portfolio generates annualized abnormal returns of up to 11.20% between 1980 and 2003. Also, abnormal returns associated with governance-spread portfolios (Gompers, Ishii and Metrick, 2003 and Cremers and Nair, 2004) decrease significantly once the asset pricing model includes this ’cash-adjusted-leverage’ factor. Finally, we propose a new ‘takeover’ factor to proxy for the risk due to changes in these risk-premia related state variables, which is shown to be important in explaining cross-sectional differences in equity returns. The paper shows why investors require a higher rate of return on firms exposed to takeovers and yet value them higher than firms protected from takeovers.

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 is 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. 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 might 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 (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 (2004) (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 rate of return.[2] When the required rate of return is low (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 three sets of results to support the theory. First, we show that a portfolio that buys firms with low cash-adjusted-leverage (high takeover exposure) and shorts firms with high cash-adjusted-leverage (low takeover exposure) is associated with annualized abnormal returns of 11.2% 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 show that abnormal returns associated with governance-spread portfolios (GIM and CN) decrease significantly once the asset pricing model includes the 'cash-adjusted-leverage' factor in addition to the Fama-French factors and the momentum factor. This not only sheds light on the results documented in GIM and CN, but also supports the idea that the cash-adjusted-leverage spread portfolio is indeed related to takeovers.

Finally, we propose a new 'TAKEOVER' factor to proxy the risk due to state variables that affect time variation in risk premia. This factor combines firm specific information on cash-adjusted-leverage, takeover defense provisions and public pension fund (or institutional blockholder) ownership. The proposed factor explains differences in cross-sectional equity returns and is associated with a annual risk premium that ranges between 2.8% and 4.4% based on the test portfolios used. 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, sometimes two-fold.

The central idea in this paper - that the price difference between firms differing in takeover exposure is related to state variables that affect risk premia - contributes to another area of active research. 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. Thus, we 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 takeover-spread portfolios using leverage and cash holdings as firm characteristics that affect takeover exposure. In section 4, 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 5, we propose a 'takeover' factor that not only includes cash and leverage but also firm specific takeover defense and information on institutional ownership to explain differences in the cross-section of equity returns. Section 5 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 using 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, 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 now 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. Differences in values of firm N and firm E thus point to differences in valuation due to takeover vulnerability.

The scenario is straightforward for firm E. Since the manager is completely entrenched and will never agree to sell, the firm value is simply $X_T E(M_T)$. The value of firm N, however, depends 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

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

We can now state the main differences in valuation due 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 a time-varying risk premium. At the same time, firms with a higher exposure, ceteris paribus, to takeovers have a higher value.*

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

Proof: *Let the probability that $S_{t+k} > S^*$ be denoted by $1 - F(S^*)$. The value of the firm N at time t, is then simply*

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

where $I_{S>S^*}$ is an indicator variable that takes the value 1 for all $S > S^*$ and indicates a takeover. This can be rewritten as

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

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. On the contrary the rate of return for firm E is 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 increase. Since the increase in the present value of synergies increases the likelihood of a takeover as well as the takeover premium that the acquirer can offer, the takeover premium that takeover prone firms expect is related to the future state variable (in this case, S_{t+k}). Thus 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 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

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

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) as our benchmark model. Since our main focus is on the relation between governance and abnormal returns, we also use the Fama-French model simply for the sake of consistency with GIM and CN.

III. Takeover Spread Portfolios Using Leverage and Cash

We first investigate if firm specific differences in takeover exposure are related to differences in their equity returns. To this end, we consider two firm-level characteristics that affect the the cost of acquisitions: leverage and cash holdings. Lower target leverage reduces the liability that the acquirer is burdened with, whereas high cash holdings increase the amount of liquid assets the acquirer enjoys, effectively reducing the liabilities incurred in the acquisition.[11] In addition, bonds may have associated covenant provisions that are activated on a takeover (e.g., poison put provision) and hence need to be repaid, increasing the effective cost of the acquisition. Thus, firms with low leverage and high cash are more likely to be targeted.[12]

To maximize the firms in the takeover-spread portfolio we combine these two aspects into one measure that we term cash-adjusted-leverage (CAL). To compute cash-adjusted-leverage,

[11] Cash, however, can also be used to repurchase shares and block a takeover attempt. A discussion can be found later in this section.

[12] To capture attractive targets, merger-and-acquisition analysts often look for a low EV/Ebitda ratio (See, e.g., ”A True Takeout Target”, SmartMoney, June 11, 2004). The EV stands for enterprise value, which is simply a company’s market capitalization (share price times number of shares outstanding), plus its debt, minus its cash. It’s the net price you would pay to buy a company in its entirety, and pay off everything it owes while pocketing any available cash. Ebitda, meanwhile, stands for earnings before interest, taxes, depreciation and amortization. It’s a measure of profits that ignores accounting adjustments for things like past acquisitions, and instead focuses on money being made now.

we subtract a firm's cash holdings from its debt liabilities. Thus, CAL is defined as (debt - cash)/total assets. This captures the notion that, from an acquirer's perspective, the target's cash holdings can be used to pay off the target debtholders. In other words, for an acquirer, target cash might effectively be negative debt. We then distribute firms into four categories (quartiles) based on the level of their CAL. We investigate the returns to a portfolio that buys firms with low cash-adjusted-leverage and shorts firms with high cash-adjusted-leverage. The returns to this CAL-spread portfolio are adjusted for factors that may affect riskiness 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 CAL-spread portfolio is associated with a significant abnormal return relative the Fama-French four factor model.

The theoretical framework presented in section 2 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 CAL-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 CAL-spread portfolio.

In Table 2 (Panel A), we report the annualized abnormal returns associated with the CAL-spread portfolios. We find that a value-weighted (equal-weighted) portfolio that buys firms with low CAL and shorts firms with high CAL generates a highly significant annualized abnormal return of 8.63% (11.20%) between 1980 and 2003, with a t-statistic of 4.08 (6.01). Consistent with the framework, the result suggests that firms exposed to takeover have a higher rates of return. Further, the result suggests that the Fama-French four factor model does not capture the risk associated with state variables related to risk-premia.

That the equally weighted results appear to be stronger than the value weighted results is also consistent with the notion that a large firm, by virtue of its size, is more difficult to takeover. In other words, this suggests that leverage and cash is likely to capture takeover exposure better among smaller firms. To investigate this further, we compute abnormal returns for a portfolio that buys firms with low CAL and shorts firms with high CAL for four different levels of firm size, using a 4x4 independent double sort based on CAL and market capitalization. We find, as expected, that the CAL-spread portfolio generates the highest abnormal returns (12.12%(value-weighted) and 13.32%(equal-weighted)) for smaller firms. Thus, CAL appears to be a better indicator of takeover exposure for smaller firms and is consistent with the view that large firms have a low exposure to takeovers. Consequently, for the remainder of the paper we focus on the equally weighted returns to the portfolio that uses CAL to capture returns due to differences in exposure to takeovers.

While there are several potential screens (firm size, past performance, asset structure etc.) used to detect takeover vulnerablity, our choice of leverage as a characteristic that affects acquisition exposure is motivated by three advantages. First, it allows us to shed light on arguments that a positive abnormal return associated with a portfolio is potentially due to higher bankruptcy risk (see Fama and French, 1993). To the contrary, since we document higher abnormal returns for firms with low cash-adjusted-leverage and since bankruptcy risk is lower with lower leverage, the use of distress as an explanation for the documented results is not appealing. Second, since GIM and CN have documented positive abnormal returns to governance-spread portfolios, one could also argue that an observed positive abnormal return is simply related to a general notion of better corporate governance, not specifically related to takeovers. If this were the case however, one would expect firms with high leverage and lower cash holdings - firms with lesser agency costs (Jensen, 1986) - to be associated with positive abnormal returns. In contrast, we find that firms with lower leverage are associated with higher returns, rendering the general governance view less appealing as well. Finally, leverage and cash are not directly related to the governance variables used in GIM and in CN, such as charter provisions, blockholders and public pension fund holdings, and yet related to the takeover vulnerability of a firm. These advantages dictated our choice of cash-adjusted-leverage to characterize takeover vulnerability.

However, the use of cash holdings to capture takeover exposure might be sensitive to the deal attitude and merits comment. Takeovers can be friendly or hostile and takeover vulnerability to a friendly deal can be different from vulnerability to a hostile bidder. While low leverage increases the probability of a takeover regardless of deal attitude (see, e.g., Mueller and Panunzi (2004)), a high cash holding can be used to prevent a hostile bid. This can be done by, for example, using the cash to buy back shares and accumulate control. Thus, contrary to the role of cash in friendly acquisitions, higher cash holdings may lead to a lower probability of facing a hostile bid (see Ivashina et. al. (2004)). As a result, by using CAL we are implicitly focusing on friendly acquisitions. This might not be problematic since the probability of completing a hostile takeover is low and since incidences of hostile takeovers are themselves less frequent. 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%.

However, to ensure that the use of CAL is not an important concern we create an independent two-dimensional 4×4 sort on leverage and cash as well as the corresponding one dimensional 4×1 sorts. We then create a portfolio that buys firm with low leverage and shorts firms with high leverage and find that such a portfolio generates abnormal returns of 6.00% for value-weighted portfolio and 9.01% for an equal-weighted portfolio (Table 2, Panel B). Therefore, concerns with the use of cash arising due to differences in deal attitude do not drive the results. We also create a portfolio that buys firms with high cash and shorts firms with low cash and find that such a portfolio generates an abnormal return of 7.46% (value-weighted) and 9.83% (equal-weighted) as well. Finally, the combined use of leverage and cash through a portfolio that buys firms with low leverage and high cash and shorts firms with high leverage and low cash is also associated with an abnormal return of 12.94% (7.35%) for the equal weighted (value-weighted) case, similar to the abnormal returns for the CAL-spread portfolios. These results document the robustness of the result that firms with low leverage and high cash are associated with higher rates of return. Since cash holdings and leverage are related to a firm's takeover exposure, this is 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. Impact on Abnormal Returns associated with Governance

In order to show a more direct link to takeovers, we now focus on the findings in Gompers, Ishii and Metrick (2003) and Cremers and Nair (2004). 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 (2004, 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 in combined with a monitoring 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 section suggest that the four factor Fama-French asset pricing model does not capture the importance of such state variables. Thus, we investigate how the abnormal returns documented in GIM and CN change on using an asset pricing model that includes the cash-adjusted-leverage factor.

Following Gompers, Ishii and Metrick (2003), we use the 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 Gompers, Ishii and Metrick (2003) 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 3, Panel A). Consistent with the findings of Gompers, Ishii and Metrick, we find that the democracy-minus-dictatorship portfolio is associated with an annualized abnormal return of 8.15% (t-statistic of 2.82) relative to an asset pricing model that uses market, size, book-to-market and momentum factors.[13]

However, the same democracy-minus-dictatorship portfolio generates a much lower abnormal return of 4.97% (t-statistic of 2.01) when the four factor model is appended with the CAL-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 2.95% that is 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 3.74% (t-statistic of 1.42) to 1.14% (t-statistic of 0.43) for the value-weighted case and from 3.67% (t-statistic of 1.58) to 0.16% (t-statistic of 0.07) for the equal-weighted case. However all these abnormal returns are insignificant.

One possible reason for a weakening of the GIM result on extending the time period from 1999 to 2003 is perhaps the reduction in takeover activity during this time period.[14] 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

[13] The abnormal returns are not exactly identical (a difference of 0.3%) due to differences in the construction of the momentum factor associated.

[14] The reduction in these abnormal returns on extending the time period is also documented by Cremers and Nair (2004).

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 CAL-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 asset pricing model includes the CAL-spread portfolio. We first compute the abnormal returns to a portfolio that buys firms with low takeover defense and high shareholder monitoring and shorts firms with high takeover defense and low shareholder monitoring. To proxy for shareholder monitoring, we follow Cremers and Nair (2004) and use two alternatives - the presence of an institutional blockholder (BLOCK) and public pension fund holdings (PP). Without the CAL factor, the abnormal returns to this governance-spread portfolio from 1990 to 2003 is now 6.32% (using PP) and 5.79% (using BLOCK). Consistent with CN, these abnormal returns are higher than the corresponding abnormal return of the democracy-minus-dictatorship portfolio. On introducing the CAL-spread portfolio to the Fama-French model, however, the documented abnormal returns to the complementary governance portfolios also decrease. For the case with public pension fund holdings (PP), the abnormal returns decrease from 6.32% (t-statistic of 2.02) to 1.03% (t-statistic of 0.36). Similarly, for the case with blockholdings, the abnormal returns decrease from 5.79% (t-statistic of 2.25) to 2.96% (t-statistic of 1.16).[15]

To summarize, we find that the abnormal returns associated with governance-spread portfolios decrease once the asset pricing model includes the CAL-spread portfolio to capture state variables associated with a time-varying risk premium. This finding has two implications. 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

[15] Since CN show that the complementary effect is stronger for smaller firms, we focus on the equal-weighted case. The value-weighted case however is also associated with a decrease in the abnormal returns due the addition of the CAL factor.

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.

Second, since the proxies of governance used to generate these abnormal returns are related to takeover exposure, it provides more evidence that the CAL-spread portfolio is likely to be related to takeovers rather than some unrelated effect. The results presented here provide evidence supporting the importance of the takeover channel in the required rate of return that investors demand. Consistent with proposition 1, we find that greater takeover vulnerability is associated with a greater rate 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. We now proceed to propose an asset pricing factor that is related to a firm's takeover exposure by not only accounting for leverage and cash but also firm specific takeover defense and shareholder monitoring; and check the ability of such a factor to explain cross-sectional returns.

V. The 'TAKEOVER' Factor

In the previous section, we find that abnormal equity returns accruing to governance-spread portfolios decrease when we append the Fama-French model with the CAL-spread portfolio. However, we have yet to investigate if takeover-spread portfolios that capture the exposure to state variables associated with a time-varying risk premium is important in explaining the cross-section of equity returns. In this section, we first propose a "TAKEOVER" factor that is motivated by differences in firm-specific takeover exposure. The proposed takeover factor is a long-short portfolio that not only uses differences in cash-adjusted-leverage characteristics, but also characteristics such as takeover defense provisions and public pension fund holdings (or blockholdings). The factor is constructed as follows. Between 1980 and September of 1990, the takeover factor is the same as the cash-adjusted-leverage (CAL) factor. Post September 1990 (when the takeover defense dat from IRRC becomes available), we use the information on takeover defense provisions and blockholdings by creating a portfolio that buys firms with (1) low cash-adjusted-leverage, (2) low takeover defense, and (3) high public pension fund holdings (or a large external blockholder) and shorts firms with (1) high cash-adjusted-leverage, (2) high takeover defense, and (3) low public pension fund holdings (or no external blockholder).

By using this additional information we hope to increase the ability of the takeover factor to capture the risk associated with a time-varying risk premium. The relatively small correlations between these three variables (CAL, BLOCK and PP) suggests that the use of these three variables might indeed increase the power of the takeover-spread portfolio (See Table 4, panel A). In addition to increasing the chances of finding any pricing effect related to takeover spreads, the use of additional information also makes it more likely that any observed result is due to takeovers rather than some unrelated factor. We first check how the results presented in section 2 change using this takeover factor (Table 4, Panel B and Panel C). We find that the abnormal returns to this takeover-spread portfolio using public pension fund holdings is 11.38%. The corresponding return using CAL , in table 2, is 8.63% and the increase suggests greater power associated with the takeover factor.

The complementarity relation between takeover defense provisions and public pension fund holdings, documented by CN, can also suggest another possible takeover-spread portfolio. We perform a robustness check using this alternative portfolio that differs only in the use of high public pension fund holding in both the long and short positions (denoted by HIGH in Table 4). This portfolio generates an even higher annualized abnormal return of 17.18%. We repeat these tests for a takeover-spread portfolio that now uses institutional blockholdings rather than public pension fund holdings (Panel C) and find similar results. We now proceed to check the ability of the takeover factor to explain cross-sectional differences returns.

A. Methodology

In cross-sectional tests between 1980 and 2003, 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 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 others.

The main econometric approach we use is the two-stage cross-sectional regression (CSR). In the first stage, the univariate 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 Shapiro (2002), in the second stage, the standard errors are corrected for a bias induced by OLS sampling errors in the first-stage univariate 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]

B. Results

Table 5 presents the correlation matrix among the factors used to explain the cross-section of equity returns. A few interesting observations can be made at this point. First, the correlations among SMB, HML and TAKEOVER factors are fairly high. Of particular interest is the negative correlation between HML and TAKEOVER (-66.19% using BLOCK and -70.61% using PP). This may arouse concerns that any detected importance of the TAKEOVER factor might be spuriously due to this correlation. However, since HML is associated with a positive premium and since HML and TAKEOVER are negatively correlated, such concerns would then imply a negative premium associated with the TAKEOVER factor. The theory, in contrast, predicts a positive risk premium associated with the TAKEOVER factor. This departure is useful - the observed negative correlation between HML and TAKEOVER would thus a priori only reduce chances of finding any positive takeover factor premium.

To further 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 several alternate sets of test portfolios. We first focus on the 100 portfolios based on book-to-market and size and report the importance of the TAKEOVER factor in various specifications. Our main results are presented in Table 6 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 7, we report pricing test using alternative test portfolios such as 25 book-to-market and size portfolios, 25 size and CAL portfolios, 25 book-to-market and CAL portfolios and the 48 industry portfolios.[17]

[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.

[17]We also use 100 portfolios instead of 25 based on these characteristics. The results are similar and are not reported here.

Table 6 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 known, the Fama-French factors are priced and the model generates a R-square of 32%. 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 $5.64\%(12 \times 0.47)$ using BLOCK. It is also striking that the R-square of the regression is now 65%. This represents an increase of 33% over the four-factor Carhart (1997) model.

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 two additional models. Model 5 excludes the book-to-market factor while Model 8 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, though the associated annual risk premium now ranges between 1.33% to 1.68%. Notably, the simple two factor model with the market and the EXIT factor still generates a R-square of 22%.

We also use a variant of the earlier TAKEOVER factor that use public pension fund holdings rather than blockholder presence - i.e., long firms with low cash-adjusted-leverage, low takeover defense and high public pension fund ownership and short firms with high cash-adjusted-leverage, high takeover defense and low public pension fund ownership. The results using this portfolio are similar to the results using blockholder ownership. Again, we find that the TAKEOVER factor is priced in all three specifications (see Models 3,6, and 9). We now proceed to verify the importance of both these TAKEOVER factors to explain cross-sectional difference in equity returns using several different sets of test portfolios. We also discuss the resulting changes in the HJ statistic.[18]

[18]The HJ statistic does not change significantly for the 100 BM/size portfolios, such that all models are decisively rejected. This is potentially due to the lower number of time-series observations.

C. Alternative Test Portfolios

To ensure that the importance of the TAKEOVER factor is robust to alternative choices of the cross-section, we investigate its performance using different sets of test portfolios. The results from this exercise are reported in Table 7. First, we consider book-to-market and size as before, but now focus on the 25 portfolios formed by a 5×5 sort on these factors. Second, to again confirm that the TAKEOVER factor is important in addition to the HML factor and that the correlation between these two variables is not driving any of our results, we also use 25 portfolios formed on a 5×5 sort based on CAL and book-to-market. Similarly, to ensure the importance of the TAKEOVER factor distinct from the size factor, we then use 25 portfolios formed on a two way sort on size and CAL. Finally, as the Fama-French portfolios and momentum generally have less explanatory power for the cross-section of industry portfolios, we focus our attention on the 48 industry portfolios formed using the industry classification in Fama and French (1997). In each of four cases, we report three models. The first uses only the four-factor model while the second and the third add one of the two alternative TAKEOVER factors to this. As before, the two versions of the TAKEOVER factor used are based on CAL and G supplemented by the use of public pension holdings or institutional blockholdings.

The results for the 25 book-to-market and size portfolios, the 25 book-to-market and CAL portfolios and the 25 size and CAL portfolios are all quite similar. In each of these cases, the TAKEOVER factor is important in explaining cross-sectional differences in equity returns. Using BLOCK, the risk premium associated with the TAKEOVER factor ranges between 1.92% (for the SIZE and CAL test portfolios) and 5.16% (for the CAL and book-to-market test portfolios). Using PP, the risk premium associated with the TAKEOVER factor is remarkably consistent and ranges between 4.56% and 5.28%. The increase in R-squares are also higher using PP. Further, for all three of these sets of test portfolios the four-factor model is clearly rejected by the data, as evidenced by the HJ-distance. However, we document some evidence that the addition of the TAKEOVER factor improves the pricing performance, as suggested by a decreasing HJ-distance. This is particular in the case for the 25 CAL and BM sorted test portfolios, for which the HJ-distance has an asymptotic p-value (under the null of exact multifactor efficiency) of 0% for the four-factor model and 3.8% once the takeover factor using BLOCK is added. [19] Using the 30 industry test portfolios, the four factor Fama-French model performs poorly, with only the market factor being significant. The TAKEOVER factor is significant at the 1% level and is important in explaining the cross-section of equity returns for these portfolios. The associated risk premium is now approximately 5.28%.

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.

VI. Conclusion

This paper considers the impact of the takeover channel on 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 show that firms with greater exposure to takeover will have a

[19] We also present 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.

higher required rate of return and at the same time a higher firm value than firms without any exposure to takeovers.

We document three sets of supporting results. First, we show that a portfolio that buys firms with low cash-adjusted-leverage (high takeover exposure) and shorts firms with high cash-adjusted-leverage (low takeover exposure) is associated with large abnormal returns relative to the Fama-French model augmented with the momentum factor between 1980 and 2003. We then show that abnormal returns associated with governance mechanisms (Gompers, Ishii and Metrick (2003) and Cremers and Nair (2004)) decrease significantly when the CAL factor is added to the asset pricing model. Finally, we propose an TAKEOVER factor that significantly increases the R-squares of cross-sectional regressions and, depending on the test portfolios used, can be associated with a risk premium of up to 5.64%.

The paper contributes to two different areas of research. The first 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. The paper also contributes to the development of an asset pricing model that captures state variable(s) related to a time-varying risk premium.

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Table I
Summary Statistics : Cash-adjusted-leverage and Firm Size

For each of the four dates for which the IRRC data are updated, this table reports some summary statistics of our sample of firms. The variable EXT denotes the level of takeover vulnerability for a firm, with higher values indicating greater vulnerability to takeovers, and is equal to 24-G, where G is the proxy created by Gompers, Ishi, and Metrick (2003) using the IRRC publications. The top panel reports the number of firms that are classified as having low and high EXT, using two different cutoff levels for these classifications. Further, we report the 25%, 50%, and the 75% percentiles of the proportion of the total shares outstanding of our sample of firms that is held by the largest institutional blockholder (BLOCK, middle panel) and by the group of the 18 largest public pension funds (PP, lower panel). Blockholders are defined as investors holding at least 5% of outstanding shares. See the appendix for the list of public pension funds.

Panel A: Percentiles of cash-adjusted leverage

	1980	1985	1990	1995	2000	2003
25% percentile	0.033	-0.10	-0.10	-0.23	-0.26	-0.33
median	0.28	0.20	0.23	0.15	0.19	0.11
75% percentile	0.48	0.45	0.52	0.44	0.50	0.45

Panel B: Percentiles of market capitalization (in millions)

	1980	1985	1990	1995	2000	2003
25% percentile	6.74	9.6015	8.97	20.9	38.90	35.09
median	24.18	34.527	34.21	71.26	162.42	136.56
75% percentile	100.60	147.62	177.02	278.79	774.08	628.027

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

We report the annualized mean, the annualized abnormal return (alpha), and its t-statistic of a (value-weighted, VW, and equal-weighted, EW) portfolio that buys firms in the highest category and shorts firms in the lowest category of cash-adjusted-leverage ((debt-cash)/total assets) for a given category of firm size based on market capitalization (1, 2, 3, or 4) or independent of firm size (All). The time period used is 1980 to 2003, and the alphas are relative to the four-factor Carhart (1997) model. The categories are formed based on the quartiles formed along the sorting dimension. Panel B reports the annualized mean, the annualized abnormal returns and its t-statistic for 3 other portfolios. The first portfolio buys firms with low leverage and high cash and shorts firms with high leverage and low cash. The second portfolio holds firms in the highest category and shorts firms in the lowest category of leverage where as the third uses cash holdings to form the long-short portfolio.

Panel A: Portfolios based on different levels of CAL

VW Portfolios				EW Portfolios			
Mean	Alpha	t-stat	CAL	Mean return	Alpha	t-stat	CAL
10.17%	7.07%	4.13	1	12.12%	9.71%	5.54	1
6.35%	0.29%	0.34	2	11.12%	5.46%	4.92	2
7.05%	-0.67%	-0.89	3	9.06%	1.76%	1.48	3
7.81%	-1.55%	-1.78	4	6.5%	-1.48%	-1.00	4

Takeover spread portfolio using CAL

VW Long-Short Portfolios				EW Long-Short Portfolios			
Mean	Alpha	t-stat	SIZE	Mean	Alpha	t-stat	SIZE
2.35%	8.63%	4.08	All	5.52%	11.20%	6.01	All
8.81%	12.12%	4.80	1	10.30%	13.32%	5.41	1
6.09%	10.88%	4.19	2	7.77%	13.87%	5.76	2
0.25%	5.00%	2.37	3	2.66%	9.21%	4.20	3
2.60%	9.22%	4.08	4	2.35%	9.30%	4.15	4

Panel B: Robustness

PORTFOLIO	VW Long-Short Portfolios		EW Long-Short Portfolios	
	Alpha	t-stat	Alpha	t-stat
low lev/high cash - high lev/low cash	7.35%	3.03	12.94%	6.03
low lev - high lev	6.00%	2.82	9.01%	5.54
high cash - low cash	7.47%	3.62	9.67%	4.74

Table III
Abnormal Returns associated with Governance Spread Portfolios

We report the annualized mean, the annualized abnormal return (alpha), and its 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) or public pension fund holdings (PP) (see Cremers and Nair, 2004). 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 cash-adjusted-leverage (CAL).

Panel A:Democracy-Dictatorship Long-Short Portfolios, 1990:9 - 1999:12, VW

Takeover-factor	N/A (FF4)	CAL
VW Alpha	8.15%	4.97%
t-stat	2.82	2.01
EW-Alpha	5.68%	2.95%
t-stat	1.95	1.17

Panel B:Democracy-Dictatorship Long-Short Portfolios, 1990:9 - 2003:12, VW

VW-Alpha	3.74%	1.14%
t-stat	1.42	0.43
EW-Alpha	3.67%	0.16%
t-stat	1.58	0.07

Panel C: Democracy-Dictatorship conditional on PP Long-Short Portfolios, 1990:9 - 2003:12, EW

EW-Alpha, PP=4	6.32%	1.03%
t-stat	2.02	0.36

Panel D: Democracy-Dictatorship conditional on BLOCK Long-Short Portfolios, 1990:9 - 2003:12, EW

EW-Alpha, BLOCK=4	5.79%	2.96%
t-stat	2.25	1.16

Table IV
Importance of Takeover Vulnerability: Using cash-adjusted-leverage(CAL),G and BLOCK

We report the annualized mean, the annualized abnormal return (alpha), and its t-statistic of a takeover-spread portfolio constructed using cash-adjusted-leverage ((debt-cash)/total assets), takeover defense and public pension fund holdings or institutional blockholders. The correlation between these variables is given in Panel A. To the compute the alphas, the time period used is 1980 to 2003, and the asset pricing model is the four-factor Carhart (1997) model. The categories are formed based on the quartiles formed along the sorting dimension. Panel B and C report the the annualized abnormal return of a (value-weighted) portfolio that buys firms with low cash-adjusted-leverage, low G and high BLOCK (or PP) and shorts firms with high cash-adjusted-leverage, high G and low BLOCK (or PP). We also consider a similar portfolio but with high BLOCK (or PP) in both the long and the short portfolio (HIGH).

Panel A: Correlation Table

	CAL	G	BLOCK
G	-1.13%	1	
BLOCK	3.30%	-9.80%	1
PP	-2.00%	9.51%	-4.48%

Panel B: Takeover spread portfolio using CAL, G and PP

Alpha	t-stat	PP
11.38%	2.14	HIGH-LOW
17.18%	3.25	HIGH

Panel C: Takeover spread portfolio using CAL, G and BLOCK

Alpha	t-stat	BLOCK
10.81%	1.92	HIGH-LOW
7.64%	1.60	HIGH

Table V
Time-series correlation matrix of factors

The table provides the correlation among the factors used to explain cross-sectional equity returns. The factors considered are the four factors in the Carhart (1997) model that includes the market, size (SMB), book-to-market (HML) and momentum (HML). The new factors introduced here are two versions of portfolio that captures the takeover-spread (TAKEOVER). Each takeover-spread portfolio buys firms with low CAL for 1981 to 1990 and firms with low CAL, low G and high BLOCK (or PP) for 1990 to 2003 and shorts firms with high CAL for 1981 to 1990 and firms with high CAL, high G, and low BLOCK (or PP) for 1990 to 2003. G is a takeover protection index used in Gompers, Ishii and Metrick (2003) whereas BLOCK and PP denote the presence of an institutional blockholder and public pension fund holdings respectively.

	Market	SMB	HML	UMD	TAKEOVER (BLOCK)
SMB	17.12%	1			
HML	-52.44%	-43.55%	1		
UMD	-2.09%	2.01%	-1.73%	1	
TAKEOVER (BLOCK)	28.13%	38.38%	-66.19%	-10.00%	1
TAKEOVER (PP)	35.59%	47.86%	-70.61%	-14.25%	83.88%

Table VI
Cross sectional pricing using the 'Takeover' Factor

We report the results for various cross-sectional regressions of mean excess returns of the 100 BM/size-sorted test portfolios regressed on a constant and their factor-betas. The univariate 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 - 2003:12. 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 and the adjusted 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 with low CAL for 1981 to 1990 and firms with low CAL, low G and high BLOCK (or PP) for 1990 to 2003 and shorts firms with high CAL for 1981 to 1990 and firms with high CAL, high G, and low BLOCK (or PP) for 1990 to 2003. G is a takeover protection index used in Gompers, Ishii and Metrick (2003) whereas BLOCK and PP denote the presence of an institutional blockholder and public pension fund holdings respectively.

Takeover-Factor	Constant	Market	SMB	HML	UMD	Takeover	R2
1. N/A	0.11	0.14	0.08	0.19	0.07		0.32
	5.10	2.81	3.15	5.92	1.03		
2. TAKEOVER - BLOCK	0.11	0.14	0.03	0.35	0.15	0.47	0.65
	4.77	2.85	1.22	8.83	2.83	6.84	
3. TAKEOVER - PP	0.11	0.10	0.00	0.34	0.18	0.51	0.43
	4.86	2.11	0.08	8.83	3.36	6.98	
4. N/A (CAPM+SMB+UMD)	0.18	-0.03	0.02		0.06		0.24
	8.50	-0.65	1.04		1.16		
5. TAKEOVER - BLOCK	0.19	-0.06	0.00		0.08	0.11	0.30
without HML	8.69	-1.31	0.12		1.47	1.90	
6. TAKEOVER - PP	0.19	-0.07	-0.00		0.09	0.14	0.25
without HML	8.79	-1.60	-0.32		1.68	2.30	
7. N/A (CAPM)	0.18	-0.06					0.02
	8.68	-0.53					
8. TAKEOVER - BLOCK	0.19	-0.06				0.10	0.22
2-factor model	8.88	-1.32				1.98	
9. TAKEOVER - PP	0.19	-0.07				0.11	0.09
2-factor model	8.95	-1.54				2.26	

Table VII

Cross sectional pricing using the ‘Takeover’ Factor: Additional test portfolios

We report the results for various cross-sectional regressions of mean excess returns of the 100 BM/size-sorted test portfolios regressed on a constant and their factor-betas. The univariate 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 - 2003:12. 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 adjusted R2, and the Hansen-Jagannathan distance and its asymptotic and empirical p-values. 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 with low CAL for 1981 to 1990 and firms with low CAL, low G and high BLOCK (or PP) for 1990 to 2003 and shorts firms with high CAL for 1981 to 1990 and firms with high CAL, high G, and low BLOCK (or PP) for 1990 to 2003. G is a takeover protection index used in Gompers, Ishii and Metrick (2003) whereas BLOCK and PP denote the presence of an institutional blockholder and public pension fund holdings respectively.

Takeover-Factor	Test Portfolios	Constant	Market	SMB	HML	UMD	Takeover	R2	HJ-dist
1. N/A	25 BM/size	0.24	-0.14	0.04	0.03	0.17		0.48	0.52
		5.59	-1.83	1.49	1.05	1.86			0.00 (0.00)
2. BLOCK	25 BM/size,	0.22	-0.1	0.02	0.11	0.15	0.23	0.49	0.48
		5.15	-1.29	0.92	2.65	1.69	3.25		0.00 (0.00)
3. PP	25 BM/size	0.17	-0.07	-0.02	0.18	0.23	0.44	0.60	0.40
		3.95	-0.86	-0.39	4.07	2.51	5.57		0.3 (2.6)
4. N/A	25 CAL/BM	0.01	0.17	0.1	0.16	0.14		0.41	0.43
		0.23	2.52	2.97	4.37	1.59			0 (1.3)
5. BLOCK	25 CAL/BM	-0.07	0.3	0.07	0.35	0.4	0.43	0.56	0.33
		-1.4	4.15	2.08	6.84	3.82	5.41		3.80 (27.20)
6. PP	25 CAL/BM	-0.05	0.25	0.04	0.32	0.29	0.38	0.57	0.36
		-0.95	3.55	1.03	6.31	3.01	4.59		0.90 (9.80)
7. N/A	25 CAL/size	0	0.1	-0.01	0.03	0.12		0.10	0.42
		0.14	1.35	-0.23	0.73	1.28			0.10 (1.20)
8. BLOCK	25 CAL/size	0.01	0.13	-0.02	0.11	0.16	0.16	0.15	0.4
		0.2	1.7	-0.4	1.92	1.67	2.06		0.00 (0.80)
9. PP	25 CAL/size	-0.01	0.17	-0.03	0.27	0.29	0.44	0.21	0.37
		-0.11	2.2	-0.75	3.57	2.78	3.85		0.40 (4.20)
10. N/A	30 industry	0.11	0.27	-0.00	0.13	-0.06		0.09	0.52
		5.43	2.97	-0.04	1.49	-0.59			0.005 (0.000)
11. BLOCK	30 industry	0.11	0.25	-0.08	0.23	-0.06	0.43	0.18	0.49
		5.20	2.82	-1.07	2.47	-0.54	3.25		0.011 (0.004)
12. PP	30 industry	0.10	0.23	-0.09	0.22	-0.04	0.44	0.22	0.49
		5.00	2.53	-1.19	2.35	-0.32	2.65		0.005 (0.002)