

# Corporate Real Estate and Corporate Takeovers: International Evidence

---

**Authors** Dirk Brounen, Mathijs van Dijk, and Piet Eichholtz

---

## Abstract

This study investigates whether corporate real estate ownership is a trigger for takeovers. The empirical analysis is based on a sample covering 225 takeovers in France, Germany, the Netherlands, and the United Kingdom between 1992 and 2003. Using a multivariate probit model that controls for various financial firm characteristics, the findings show that the role of corporate real estate in takeovers depends on the nature of the takeover, the industry, the period, and the country. The presence of corporate real estate is a significantly positive predictor for takeovers within the same industry. Companies that have been taken over appear to have been reducing their real estate holdings prior to the takeover, which would suggest a financial distress situation.

---

Real estate does not generally receive a lot of attention from corporate executives. For many of them, real estate is an asset they don't know much about, and aren't very interested in. Managing real estate assets is usually quite different from managing the core competences of the firm. It is viewed as just one of the production factors needed to make and sell the products in which the true competence of the firm lies.

Indeed, in an oft-quoted survey of more than seven hundred executives of large firms in the United States, Arthur Andersen and Company (1993) reported that the vast majority of respondents did not feel a need to link strategic real estate planning with business planning. Very few companies produced recurring reports on the performance and value of their real estate assets, suggesting that real estate was not managed efficiently in the early 1990s. This notion has been supported by Brennan (1990), who has introduced the term "latent assets" to describe situations where the stock price of a company does not reflect the true value of all the assets it owns. He specifically mentioned real estate holdings as a class of corporate assets for which this label applies. If that would indeed be the case, the ownership of a real estate portfolio could be an indicator for takeovers. Brueggeman, Fisher, and Porter (1990) have reviewed real estate's role in the corporate restructuring of the 1980s, and they have shown that rational investors

may value companies with large real estate holdings at prices well below break-up value, even when stock markets are efficient. Although their evidence is mainly anecdotal, they do make a strong case for a dominant role of real estate in takeovers. They state that “... the value of corporate real estate is “hidden” from investors and therefore not fully reflected in stock prices.”

These ideas are informally confirmed in the financial press, where articles regarding takeovers regularly mention the possibility of generating quick revenues of the target’s real estate portfolio as a motivation for the bidder. As an example, the German Schickedanz family acquired a majority stake in the German retail group Karstadt-Quelle in Spring 2005.<sup>1</sup> Financial media speculated that the family could profit from a sale of parts of the group: “Retail analysts believe the individual assets of the group are worth far more than the share price currently indicates.” The *Financial Times* reported estimates of Karstadt-Quelle’s corporate real estate value ranging from € 6b. to € 7b., while the company’s market capitalization at the time was only € 1.86b. A more traditional takeover example in which real estate assets appear to play a dominant role is 2005 merger of Kmart and Sears, Roebuck and Company.<sup>2</sup> The combined firm holds a real estate portfolio of 3,400 stores. “Kmart’s hidden real estate value” was mentioned as an important motive for the merger.

Whether or not corporate real estate holdings play an important role in the corporate takeover market beyond this anecdotal evidence is the main question this study tries to answer. A search of the existing literature revealed only an analysis of the U.S. takeover market of the early 1980s. The analysis in the current study extends the literature by examining the issue for a sample of four countries: France, Germany, the Netherlands, and the United Kingdom and by analyzing the unexamined sample period of 1992–2003. Furthermore, the role of real estate in these takeovers is analyzed on the basis of a measure of the value of corporate real estate that is considerably more accurate than measures used in the existing literature.

This paper proceeds as follows. First there is a brief overview of the literature regarding corporate property actions, followed by a presentation of more information concerning the data and data sources. Next, a predictive takeover model is developed, which enables isolation of the impact of corporate real estate ownership on takeover likelihood. The paper closes with a summarization of the main results and conclusions.

---

## Corporate Real Estate and Management Decisions

If real estate has a large stake on the corporate balance sheet and profit and loss account, then it seems unlikely that it would not figure in the bidder’s deliberations regarding a possible takeover. Veale (1989) estimated the costs associated with owning corporate properties, and reported that these costs have become second only to payroll costs in many organizations. Relative asset values have first been

estimated by Zeckhauser and Silverman (1983), who concluded that real estate accounts for 25% to 40% of the total assets of the average U.S. firm. More recently, Seiler, Chantrath, and Webb (2001), using a sample comprising eighty U.S. companies, reported a slightly decreasing trend in real estate ownership from values around 32% of total assets in 1985 to approximately 27% in 1994.

Brounen and Eichholtz (2004) extended the U.S. analysis to nine of the most important economies worldwide. They looked at corporate real estate ownership in time, across countries, and across 18 industrial sectors. For their complete sample, corporate real estate holdings were shrinking as a percentage of total assets, from 34% of total asset value in 1990 to 28% in 2000. However, they found that this percentage differed greatly across countries and sectors, with strong corporate real estate ownership in Australia and Canada, and relatively low values in France, Germany, and the Netherlands. Real estate ownership tended to be high in industries that need very user-specific real estate, or for which real estate is a key value driver, such as food retail. This would suggest that country and sector are of significance in real estate's role in takeovers. Based on these studies, we can conclude that real estate's corporate position is still important, but decreasingly so. Assuming corporate space needs have not structurally changed, this implies that companies increasingly choose to rent their space.

The performance effects associated with real estate holdings have been investigated by Deng and Gyourko (2000) and Seiler, Chantrath, and Webb (2001) for the U.S., by Liow (2004) and Liow and Ooi (2004) for a sample of Singapore companies, and by Brounen and Eichholtz (2004) for an international sample of companies. These studies showed that high property ownership levels were associated with poor stock performance for risky firms (Deng and Gyourko, 2000), with weak abnormal return performance (Brounen and Eichholtz, 2004; and Liow, 2004), and with weak economic value added (Liow and Ooi, 2004). Besides that, real estate ownership is shown not to generate diversification benefits (Seiler, Chantrath, and Webb, 2001).

The research regarding corporate property-related actions mainly involves real estate spin-offs and sale-and-leaseback transactions.<sup>3</sup> Hite, Owers, and Rogers (1987) showed a 5.7% average share price increase on spin-off announcements, using a sample that covered the period from 1962 to 1982. They split their sample into spin-offs by non-real estate companies and those by real estate companies, and found that the stock market reaction was significantly larger (9.1%) for the former than for the latter—no statistically significant reaction was found for that group. Glascock, Davidson, and Sirmans (1989, 1991), Myer, He, and Webb (1992), and Booth, Glascock, and Sarkar (1996) have done research in a similar vein, and also found a positive abnormal return associated with corporate real estate divestiture announcements, which suggests that stockholders benefit when companies sell their properties, providing some support for the latent asset idea of Brennan (1990).

Sale-and-leaseback transactions have received more research attention. Rutherford (1990, 1992), Slovin, Sushka, and Polonchek (1990), Alway, Rutherford, and

Smith (1995), and Ezzell and Vora (2001) have all documented positive price reactions to the announcement of sale-leasebacks of real estate by U.S. firms. They attributed these wealth gains to the reallocation of tax benefits. That is why Alwayay, Rutherford, and Smith predicted that the value of taxes transferred from the U.S. government through these transactions would be reduced by the U.S. Tax Reform Act of 1986. Their empirical evidence showed that this is indeed the case. Besides these tax effects, existing financial theory would suggest that sale and leasebacks should have effects similar to other types of debt. More recently, Fisher (2004) has also analyzed sale-and-leaseback transactions, distinguishing long-term and short-term leasebacks. In the former, the real estate continues to be integrated in the firm to a greater extent than in the latter. Fisher developed a theoretical model of the sale-and-leaseback transaction, predicting that firms choose shorter lease lengths when there are positive wealth gains to be captured relative to continued ownership of the asset. Her empirical results indeed showed that only sale and leasebacks with short leases were associated with a positive abnormal return for the shareholders of the selling firms, while those with long-term leases were not.

Rutherford and Nourse (1988) investigated the impact of the formation of corporate real estate units by companies using a standard event-study approach. Here also, gains to shareholders were reported, and, interestingly, these gains were highest when the real estate subsidiaries thus created were publicly listed.

In short, the empirical evidence to date suggests that corporate real estate sales create positive wealth effects, and that these wealth effects depend on two things: the corporate tax regime, and the degree to which the real estate remains integrated within the selling firm. Stronger wealth effects are associated with higher potential tax shields and with less integration. The results by Hite, Owers, and Rogers (1987), Rutherford and Nourse (1988), and Fisher (2004) indicate that market investors place higher values on real estate assets when in the hands of real estate companies or specialized property management entities rather than in those of diversified companies, which could be a corporate restructuring argument besides other such arguments mentioned in the literature.

Analyzing corporate real estate sales in the context of firm takeovers requires a general understanding of what drives corporate takeovers. A paper by Andrade, Mitchell, and Stafford (2001) discusses some of these takeover motives, for example, merger synergies, excess capacity in certain industries, and external shocks (such as deregulation, oil price shocks, and technical innovations). Besides these reasons to merge, a number of authors (e.g., Wruck, 1990; and Clark and Ofek, 1994) have shown that financial distress can be an important driver for corporate restructuring. Firms performing relatively poorly over an extended period of time are significantly more likely to end up as a target in the takeover market. Other firm-specific takeover triggers are the target's tangible assets (Ambrose and Megginson, 1992). Using a sample of U.S. firms, Ambrose and Megginson (1992) found that the probability of receiving a takeover bid is positively related to tangible assets. In his 1990 study, Ambrose repeated this

analysis by focusing primarily on the role of corporate real estate holdings instead of the broader defined ‘tangible assets.’ Investigating a sample of 170 successful and unsuccessful U.S. takeovers in the period 1979 through 1986 using a general logit probability model, he discovered that corporate real estate holdings significantly increased the likelihood of a firm becoming a takeover candidate.

Overall, the takeover literature shows that financial variables capturing financial synergies and distress are most successful in determining why some firms turn into targets while others do not. In line with Ambrose (1990), this study extends this framework by adding corporate real estate holdings to the equation. If corporate real estate is managed in a suboptimal manner, high corporate real estate holding might inspire raiders to bid on the firm in order to retrieve the concealed corporate real estate value.

## Methodology

The principal objective of this study is to assess whether holding more real estate assets will lead to a higher probability of becoming the target in a takeover in a sample of international firms. To that end, it will be determined if a variable that indicates whether or not a firm is taken over in a certain year is related to a number of explanatory variables, including a measure for real estate holdings. Although a straightforward approach to this question would be a linear probability model, a significant drawback of this methodology is that fitted probabilities can be less than zero or greater than one. This limitation can be overcome by using more sophisticated binary response models, as is commonly done in the takeover literature. Therefore the main analysis is based on a probit model of the following form:

$$P(BID,i) = F(X_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta X_i} e^{-s^2/2} ds. \quad (1)$$

Where *BID* is a binary variable that indicates whether a firm *i* receives a takeover bid and  $P(BID,i)$  is the probability that firm *i* will be taken over, which is modeled as a function of the vector of explanatory variables  $X(i)$ .  $\beta$  is a vector of unknown parameter estimates that represents the nature of this relationship. Hence, in this model the probability of a firm receiving a takeover bid is based on its own characteristics, which are represented by the vector  $X(i)$ . In a probit model, the functional form of this relationship is represented by the cumulative probability function of the standard normal distribution.<sup>4</sup>

The model is calibrated in order to include the most pivotal financial firm characteristics, which are selected based on the literature regarding the prediction of takeovers (see Palepu, 1986; Barnes, 1999; and Espahbodi and Espahbodi,

2003). These variables are Return on Assets, Sales over Assets, Growth in Sales, Average Liquidity Ratio, Cash Holdings over Assets, Debt-to-Equity Ratio, Book Value of Assets, Price-Earnings Ratio, Dividend Yield Ratio, Price-to-Book Ratio, and Average Excess Stock Return. Typically, items like Return on Assets, Sales over Assets, Growth in Sales, Dividend Yield, and Average Excess Return all function as indicators for firm performance, hence are expected to have a negative influence of the likelihood of a firm ending up as a target in the takeover market. The existing literature already showed that weakly performing firms are more likely targets than strong performers. Variables like the Average Liquidity Ratio, Cash Holdings over Assets, and Debt-to-Equity Ratio relate to the financial firm structure and typically increase the odds of becoming a target, while the Price-Earnings Ratio and the Price-to-Book Ratio signal the relative value of firms and tend to have a negative impact on the takeover probability. This specification is extended by including Real Estate over Assets as an additional explanatory variable. Moreover, due to the fact that financial distress is often found to be a predictor of takeovers, Change in Real Estate Holdings is included in the model as well, since companies may be forced to sell (part of) their corporate real estate holdings to avoid such distress. The exact definitions of all these variables are provided in the Appendix. In order to take account of time-variation in the relationship between real estate ownership and takeover probability, year dummies are included in all multivariate regressions.<sup>5</sup>

The literature concerning the prediction of takeover targets using logit and probit models has taken a fundamental methodological turn with the seminal paper of Palepu (1986). More recently, Barnes (1999) and Espahbodi and Espahbodi (2003) have made some important contributions to this line of research. Before Palepu (1986), a number of empirical studies had obtained apparently impressive results to predict acquisition targets, with reported prediction accuracies up to 90%. Palepu noted that such accuracy would go against market efficiency: if predicting takeovers was really that easy, investors would use the models, and reap the stock price appreciation associated with takeover bids. In other words, if these models would be really that good, why were their makers not rich? Indeed, Jensen and Ruback (1983) empirically showed that the market has a hard time to predicting future targets. Palepu then analyzed the empirical methods used in the existing models, and concluded that their interpretation was fundamentally flawed, especially in the sampling procedure they employed.

Palepu (1986) described two distinct ways of composing a sample of firms consisting of both targets and non-targets in order to obtain a model for predicting takeovers. In the first method, commonly referred to as “random sampling,”  $n$  firms are drawn from the entire population of firms. These  $n$  firms are subsequently divided into targets and non-targets. However, as the ratio of non-targets to targets in a random sample is likely to be very high, the information content of a random sample may be quite small. This provides a sound econometric justification for “state-based sampling,” in which  $n_1$  firms are randomly drawn from the total population of target firms and  $n_2$  firms are drawn from the non-target

subpopulation. The benefit of state-based sampling is that it provides greater “information content” for the model estimation when the number of observations within a population is small. As state-based sampling can be shown to provide more efficient estimates, this sampling methodology is employed in this study. An important caveat of state-based sampling is that the prediction probabilities can exhibit important biases when the estimation procedure is based on the assumption of random sampling. Although Palepu suggests a straightforward procedure for correcting these biases, the primary interest here concerns the ranking of takeover probabilities, and hence the bias in the estimates of absolute probabilities does not affect our inferences. The parameters that determine the population probability  $p$  can easily be recovered since “all the parameters other than the constant term are unaffected...” (Palepu, 1986, p. 21). However, to allow for a proper comparison between the authors’ state-based sample results with findings in previous research based on random sampling procedures, the estimated intercept of the model is rescaled in accordance with the sample structure (see Palepu, 1986).

The results of the probit regressions are summarized in the exhibits as follows. First, the point estimates of the coefficients ( $\beta$ ) are depicted. Second, the standard deviation gives an indication of the precision of the estimate. Third, the statistical significance of a coefficient of a particular explanatory variable can be derived from the  $p$ -value, depicted in the column “Coefficient significant at.” All exhibits also depict  $n$ , the number of firms included in the sample employed for the probit estimation, and the McFadden  $R^2$ . The latter statistic is a measure for the explanatory power of the model, where a higher McFadden  $R^2$  indicates that the explanatory variables are able to explain a larger part of the variation in the dependent variable  $P(BID, i)$ . Since the sampling procedure proposed by Palepu (1986) is employed to build a predictive model of takeovers, these  $R^2$ s are expected to be low.

---

## Data

The Thomson One Banker database is used as universe to build the sample of listed companies. Samples of companies for France, Germany, the Netherlands, and the United Kingdom are selected from the database for the period 1992–2003. The overall sample is selected in the following way. First, all takeovers in which a change of control has taken place are identified. Change of control is here assumed when a change of ownership occurs in the majority of the shares. The sample only contains third party acquisitions, while management buy-outs and leveraged buy-outs are excluded. The result was a total sample size of 2,086 takeover targets, of which 1,114 were publicly listed. Since the complete required set of company information was only available for those 1,114 companies, they are used as a basis for further analysis.

Finding an appropriate measure for corporate real estate ownership is challenging. Most previous studies<sup>6</sup> use the ratio of property plant and equipment to total assets,

but for some sectors—especially the capital-intensive ones—this variable often contains so much equipment that the perspective on property ownership is blurred. Furthermore, the extent to which this is the case is very industry-specific, which makes this variable hard to use across sectors. Since this study is concerned with companies across different sectors, a more accurate measure of the true value of real estate is used. This measure was computed by dividing Worldscope's gross book value of real estate (excluding real estate leases) by the book value of total assets. This variable could be calculated for 225 of the remaining 1,114 companies, so the remaining sample consists of 225 takeover targets.

The ideal situation would be to have current real estate market prices for all 1,114 public takeover targets; however, because this is not possible, the results may be distorted, so this potential outcome is examined next. First, not having market prices but book values implies imprecise measurement of property values, and will therefore make it harder to find a statistically significant relationship, but this only means that a statistically significant result implies that real estate is indeed important as a predictor of takeovers. Second, the study is limited to the companies reporting property values and it is possible that these are the most transparent companies, making it relatively easy for the stock market to “see through” these companies and assess the true value of the real estate. This would make mispricing less likely, and would therefore weaken the possible impact real estate ownership has on takeover likelihood, again making it harder to find a statistically significant relationship between these variables.

Exhibit 1 pictures the sample distribution for each of the four sample countries, both in time and across the 15 industries examined. France and Germany are the dominant countries in the sample. For these countries, there are 96 and 91 takeover targets in the sample, respectively. The U.K. and Dutch samples are much smaller. For the U.K. sample, this is mainly caused by a lack of codes linking the different data sources used. The second panel of Exhibit 1 presents the sample composition by industry, showing that the sample is not very evenly distributed across sectors. Miscellaneous Manufacturing is the dominant sector, representing 39% of all sampled takeovers, while no other sector exceeds 10%: Retail Trade is in second place with 11% of the sample.

Besides this sample of takeover targets, a control sample was built as follows. For the same 1992–2003 period, all public companies in the Thomson universe have been selected for the four sample countries. To avoid survivorship bias, both the active and non-active firms are selected. Out of that universe, 2,866 companies are selected for which accurate corporate real estate data are available for at least one year during the sample period. As there are no objective guidelines as to how many control firms to select, three non-target firms are randomly drawn for each target firm in the sample, as follows. For each year, how many targets are incorporated in the sample for a given country is determined. Three firms are then randomly selected from that country that have not been taken over during the sample period and for which information about real estate ownership is available in the previous year (as the probability of a takeover to the amount of real estate assets in the year before the takeover is analyzed).

**Exhibit 1** | Takeover Sample Distribution by Country, Year, and Industrial Sector

	FRA	GER	U.K.	NL	Total	%
<b>Year</b>						
1992	1	0	0	0	1	0%
1993	9	5	2	0	16	7%
1994	7	6	2	0	15	7%
1995	12	5	4	3	24	11%
1996	16	9	2	1	28	12%
1997	8	10	1	2	21	9%
1998	6	6	4	2	18	8%
1999	1	15	1	0	17	8%
2000	11	10	4	2	27	12%
2001	7	6	0	2	15	7%
2002	12	8	3	2	25	11%
2003	6	11	1	0	18	8%
Total	96	91	24	14	225	100%
<b>Sector</b>						
Agriculture	0	0	0	0	0	0%
Mining	1	1	0	0	2	1%
Construction	4	4	0	1	9	4%
Food & Tobacco	6	3	0	0	9	4%
Textile	8	3	4	2	17	8%
Chemicals & Petroleum	6	3	2	1	12	5%
Misc. Manufacturing	36	41	5	6	88	39%
Transportation	1	6	0	0	7	3%
Public Utilities	6	10	2	1	19	8%
Wholesale Trade	5	5	2	1	13	6%
Retail Trade	7	12	4	1	24	11%
Hotels	2	0	2	0	4	2%
Personal Services	0	0	0	0	0	0%
Business Services	13	3	2	1	19	8%
Health Services	1	0	1	0	2	1%
Total	96	91	24	14	225	100%

*Notes:* This table presents the composition of the takeover sample, measured in number of observations and percentage of the total sample, by country, year, and industrial sector.

Exhibit 2 provides information regarding the intensity of corporate real estate ownership for the total sample. The sample is disaggregated by sector and covers the period from 1992 through 2003. In line with Brounen and Eichholtz (2004), strong cross-sector variance in ownership levels is found, ranging from 52% for hotels to 9% for public utilities. Looking at corporate real estate holdings across industries, as reported in the bottom row of the first panel of Exhibit 2, the same decreasing trend reported by previous authors is seen, but in a less pronounced way. Average ownership decreases from 21% in 1994 to 19% in 2002, but the

**Exhibit 2** | Corporate Real Estate Ownership Ratios for Total Sample

Aggregated Samples	N	Corporate Real Estate Ownership Level								
		2002	2001	2000	1999	1998	1997	1996	1995	1994
Agriculture	25	20%	19%	15%	17%	18%	18%	18%	19%	18%
Mining	62	14%	14%	15%	17%	20%	18%	21%	21%	24%
Construction	78	14%	12%	11%	12%	11%	11%	12%	12%	12%
Food & Tobacco	136	23%	23%	22%	23%	23%	23%	22%	22%	22%
Textile	255	16%	15%	15%	16%	15%	16%	16%	16%	16%
Chemicals & Petroleum	217	15%	14%	14%	15%	16%	15%	15%	16%	18%
Misc. Manufacturing	916	13%	13%	13%	14%	14%	14%	15%	15%	15%
Transportation	126	18%	18%	17%	17%	20%	19%	20%	18%	20%
Public Utilities	137	9%	10%	10%	11%	12%	11%	11%	12%	14%
Wholesale Trade	178	13%	13%	12%	13%	13%	14%	14%	14%	15%
Retail Trade	276	22%	21%	21%	22%	23%	23%	22%	22%	22%
Hotels	43	52%	52%	48%	53%	51%	51%	52%	48%	52%
Personal Services	9	10%	11%	11%	11%	11%	12%	12%	13%	14%
Business Services	345	15%	14%	13%	16%	17%	16%	16%	16%	19%
Health Services	63	23%	23%	25%	26%	25%	23%	24%	26%	29%
Total/ Average	2866	19%	19%	18%	19%	20%	20%	20%	20%	21%

Notes: This table provides average corporate real estate ownership ratios—measured by the book value of real estate divided by the book value of total assets—by year and industrial sector for the total four-country sample.

decreasing overall trend does not imply a decreasing trend for all sectors. Besides that, it is clear that looking at pure real estate values instead of the Property Plant and Equipment variable is likely to add some accuracy to the analysis, as the difference between the two is rather large: previous studies using PPE reported average corporate real estate ownership ratios around 30%, while this is closer to 20% in the current sample.<sup>7</sup>

Besides the real estate ownership ratio, a range of firm-specific control variables are included in the probit model.<sup>8</sup> The data have been manually checked for outliers, defined as zero values for variables such as Total Assets and extraordinarily large observations for any of the variables (more than four standard deviations away from the mean). A very small number of firms for which these observations occurred have been removed from the sample. Exhibit 3 presents statistics for the firm characteristics that are subsequently used as control variables in the model for the full sample. The first two columns provide information on target firms, the next two columns on the non-target control group, and the last column gives the results of a significance test of the difference between the means.

**Exhibit 3** | Basic Statistics for Explanatory Variables—Targets and Control Group, Full Sample

Full Sample	Target Firms		Non-target Firms		Difference Significant At
	Mean	Std. Dev.	Mean	Std. Dev.	
Return on assets	2.57	11.24	4.00	22.39	0.51
Sales over assets	1.18	0.71	1.18	0.82	0.29
Growth in sales	17.95	73.40	23.02	49.80	0.33
Average liquidity ratio	0.51	0.25	0.53	0.22	0.11
Cash holding over assets	0.06	0.10	0.07	0.09	0.18
Average debt-to-equity ratio	141.32	964.59	45.58	464.34	0.44
Book value of assets	2941.02	14680.35	2908.53	9296.78	0.33
Price earnings ratio	17.03	161.31	13.12	43.23	0.48
Dividend yield ratio	2.34	6.53	2.62	5.09	0.15
Price-to-book ratio	2.64	6.43	2.82	5.15	0.83
Average excess stock return	-5.56	53.31	-6.74	46.34	0.21
Real estate over assets	0.20	0.32	0.23	0.20	0.17
Real estate over assets (sector-adjusted)	0.03	0.23	0.00	0.17	0.43

*Notes:* This table provides mean values and standard deviations for the explanatory variables used in the probit model. The last column provides significance levels of the difference in means between the target sample and the control group, based on univariate *t*-tests using pooled variance estimates.

The numbers are largely in line with Ambrose (1990).<sup>9</sup> Like Ambrose, lower sales growth rates, lower liquidity numbers, and higher leverage levels are found for the targets compared to the non-targets, but in line with Ambrose's results, most of these differences lack statistical significance.

## Results

In line with Palepu (1986), an explanatory model of corporate takeovers is estimated, based on the range of the firm-specific variables. Exhibit 4 presents the multivariate regression results for the entire four-country sample and for the 1992–2003 sample period. As some sectors exhibit higher real estate ownership levels than others, in order to capture potential latent asset characteristics of corporate real estate, real estate ownership should be measured relative to the sector mean.<sup>10</sup>

The regression results for the firm-specific variables presented in Exhibit 4 exhibit a number of notable differences with those reported in the existing takeover literature. The probit analysis seems to indicate that takeovers are associated with

**Exhibit 4** | Multivariate Probit Analysis 1992–2003

	Model 1	Model 2
Intercept	0.753	0.826
Return on assets	-0.419	-0.649
Sales over assets	-0.108	-0.090
Growth in sales	-0.033	-0.039
Average liquidity ratio	-0.357	-0.081
Cash holding over assets	-0.648	-1.348
Debt-to-equity ratio	0.050***	0.019
Book value of assets	0.001	0.001
Price earnings ratio	0.001	0.001
Dividend yield ratio	-0.045**	-0.059**
Price-to-book ratio	-0.005	0.002
Average excess stock return	0.114	-0.002
Real estate over assets (sector-adjusted)	-0.202	-0.321
Change in real estate		-0.223**
McFadden R <sup>2</sup>	0.033	0.054

Notes: In Model 1,  $N = 678$ ; in Model 2,  $N = 474$ .  
 \* Significant at the 10% level.  
 \*\* Significant at the 5% level.  
 \*\*\* Significant at the 1% level.

firms in financial distress: the likelihood of being a takeover candidate is associated with weak and shrinking sales, a low liquidity position, high debt, and low dividend. The latter two effects are statistically significant at conventional levels. The other variables are not found to be statistically significant. The coefficients for the financial control variables are in line with previous findings in the takeover literature and support the findings of Ambrose (1990). This does not apply to the findings regarding the corporate real estate holdings. For the sample as a whole, a statistically insignificant relationship is found between real estate holdings and the probability of being taken over, which contrasts with the positive and significant relationship that was documented by Ambrose (1990) for the U.S.

The fact that distress-related variables are found to be associated with increasing takeover likelihood is in line with the literature. Clark and Ofek (1994) argue that a takeover may be a way to reorganize the operations of a firm in financial difficulties, and examine a sample of 38 firms in distress that have been taken over in the period 1981–1988. The acquisitions announcements of these takeovers often indicate that the bidder is acquiring the target because it is perceived to be in financial trouble. Clark and Ofek find little evidence that the bidder is able to reorganize the target successfully, as post-merger performance is generally poor. A widely cited paper by Mitchell and Mulherin (1996) shows that takeovers arise as a reaction to economic shocks at the industry level, such as deregulation, changes in input costs, and innovations. Such shocks are also associated with financial distress, forcing the companies in an industry to reorganize. Takeovers may be a relatively efficient way of achieving this, making these a likely indication of the underlying economic changes taking place in an industry. The authors are not aware of any studies documenting the importance of financial distress in the takeover boom in the 1990s.

If distress constitutes a good explanation for the empirical results, the negative relationship between corporate property ownership and takeovers could be explained by the sale of properties prior to the takeover. Wruck (1990) describes that asset sales are often an important part of the organizational restructuring that accompanies financial distress. If firms have a high debt ratio and a low dividend yield, selling part of the corporate real estate portfolio in order to relax financial restraints might be an attractive strategic option. This does not necessarily mean that real estate is a deterrent against takeovers, but that firms may try to postpone or avert a takeover by sales in the real estate portfolio in order to increase liquidity and thereby create escape options. In this case, a decline in real estate holdings should be observed prior to the takeover, which is exactly what the findings reveal (Exhibit 4). Exhibit 4 also reports the regression results when the growth in real estate is incorporated as an additional explanatory variable. This variable has a negative coefficient, which is statistically different from zero at the 5% level. Including this new variable in the model has the additional effect of reinforcing the negative relationship between real estate ownership and takeover probability. Consequently, contrary to the existing U.S. literature, the findings in this study reveal that corporate real estate ownership may actually deter instead of trigger takeovers.

Based on the earlier quoted empirical work, which found that shareholder wealth creation through corporate real estate actions was partly driven by the nature of the tax regime, the results are expected to differ strongly by country, due to the fact that corporate tax regimes are national. This suggests that the effects of corporate property ownership on takeovers are partly country-specific, implying that insignificant results for the sample as a whole may be explained with differences across countries. That is why an analysis on the country level is conducted as well. The multivariate probit analysis is repeated for each of the four country sub-samples. The results, as presented in Exhibit 5, differ strongly across countries, ranging from a positive 3.229 for the U.K. to a negative  $-0.854$  for Germany. In both cases, these regression coefficients are significant at the 10% level. For the Netherlands, a negative, but statistically insignificant relationship is found, while an insignificantly positive relationship is found for France. Regarding the Change in Real Estate variable, insignificant results are found for all countries except for the Netherlands, where this variable is negative and significant. This seems to be related to financial distress. When comparing the control variables

**Exhibit 5** | Multivariate Probit Analysis 1992–2003, Across Countries

	U.K.	Germany	France	Netherlands
Intercept	-0.452	1.487	0.913	0.524
Return on assets	-0.432	0.324	0.239	-14.575
Sales over assets	-0.535	-0.027	0.025	0.726
Growth in sales	-0.149	-0.049	0.247	-2.913*
Average liquidity ratio	3.616	-1.092	-0.115	-1.201
Cash holding over assets	-4.171	-0.163	-3.367	1.368
Debt-to-equity ratio	0.083	0.034	-0.034	0.127
Book value of assets	0.001**	-0.001**	0.001*	-0.001
Price earnings ratio	-0.026	-0.001*	0.001	0.069*
Dividend yield ratio	-0.008	-0.064	-0.015	-0.101
Price to book ratio	0.054	-0.008	-0.015	-0.305
Average excess stock return	0.010	0.278	-0.533	-1.089
Adj. real estate over assets	3.229*	-0.854*	0.675	-0.495
Change in real estate	1.063	-0.019	-0.862	-4.950**
McFadden R <sup>2</sup>	0.234	0.066	0.096	0.455

Notes: For the U.K.,  $N = 50$ ; for Germany,  $N = 219$ ; for France,  $N = 173$ ; for the Netherlands,  $N = 32$ .

\* Significant at the 10% level.  
 \*\* Significant at the 5% level.  
 \*\*\* Significant at the 1% level.

for the targets in the Dutch sub-sample to the Dutch control group, the targets do very poorly regarding return on assets, sales growth, and free cash flow, and are much more indebted. Across the board, a pronounced decrease in real estate holdings is observed in the Dutch firms that are taken over.

One of the tax issues that could drive the cross-country differences is the level of property transfer taxes. If these taxes would be very high, then taking over a company with strong real estate ownership could be a relatively cheap way to acquire property. If that would indeed be a motivation for a takeover, increased takeover likelihood with increasing property transfer taxes would be expected. During most of the sample period, France had by far the highest transfer taxes: 19%, which would be in line with the positive relationship found for that country. On the other hand, the U.K. has the lowest transfer taxes, and the strongest positive relationship between takeover likelihood and property ownership. Therefore a clear conclusion can not be drawn regarding the role of transfer taxes in this regard.

It could be that transfer taxes do not tell the whole story, and that overall transaction costs related to the transfer of real estate ownership should be examined: taxes, agent fees, and legal fees. Taking over a company is a way to avoid such costs. If this would indeed be a driver for takeovers, the strongest positive relationship would be found between real estate ownership and takeover likelihood for the country with the highest transaction costs, and the probability estimator and the level of the transaction costs would be positively related. However, this is not the case. In fact, the country with the corporate real estate coefficient in Exhibit 5—the U.K.—has the lowest transaction costs. Therefore, transaction costs do not play a role here.

Besides differences in tax regimes and transactions costs, the cross-country differences could also be explained by market circumstances. The hidden value of property is unlikely to be present in a situation of falling property prices. This could imply a negative relationship between corporate property ownership and takeover likelihood when prices are going down. During the sample period, the sample country with the worst property market was Germany, which could explain the negative coefficient for Germany. This notion is supported by the significantly positive coefficient for the U.K., whose property market has generally been very strong throughout the sample period. This suggests that market circumstances may indeed play a role in the relationship between real estate ownership and takeover likelihood.

The relationship between real estate ownership and takeover probability may also depend on whether the takeover occurs within the same sector. The hypothesis is that buyers who bid for companies in the same sector are better informed about the true value of these firms' assets than buyers from other sectors. Hence, a more positive relationship is expected between corporate real estate ownership and takeover likelihood for within-sector deals than for cross-sector ones. To test this, the takeover sample is split into two parts, based on the criterion of whether the

transaction is between companies from the same sector or not. Multivariate probit regressions are then conducted, one for within-sector deals compared to cross-sector deals, and one for within-sector deals compared to the control sample of companies that have not been taken over. Exhibit 6 reports the test results, which are rather striking: it shows that real estate is a significantly stronger deal trigger for within-sector takeovers when compared to cross-sector ones. When compared to the non-targets, the probability of a within-sector takeover is also positively related to real estate ownership, but this relationship is not statistically significant. These results suggest that informed buyers seem to be induced by the presence of real estate assets to a greater extent than non-informed buyers. Interestingly, the growth in real estate over assets enters the regression depicted in Exhibit 6 with a negative sign, suggesting that the effect of changes in real estate detected in Exhibit 4 stems in part from the within-sector deals.

**Exhibit 6** | Multivariate Probit Analysis of Takeovers within Sectors 1992–2003

Variable	Within-Sector Deals Compared to Cross-Sector Deals	Within-Sector Deals Compared to Non Deals
Intercept	1.391	0.729
Return on assets	-1.187	-1.085
Sales over assets	-0.042	-0.087
Growth in sales	-0.084	-0.036
Average liquidity ratio	-0.251	-0.391
Cash holding over assets	2.815	-0.227
Debt-to-equity ratio	0.015	0.035
Book value of assets	0.001*	0.001
Price earnings ratio	-0.003**	-0.001
Dividend yield ratio	-0.044	-0.062*
Price to book ratio	-0.002	0.004
Average excess stock return	0.337	0.085
Adj. Real estate over assets	1.221*	0.005
Change in real estate	0.006	-0.291**
McFadden R <sup>2</sup>	0.075	0.044

Notes: For Within-Sector Deals Compared to Cross-Sector Deals,  $N = 153$ ; for Within-Sector Deals Compared to Non Deals,  $N = 404$ .

\* Significant at the 10% level.  
 \*\* Significant at the 5% level.  
 \*\*\* Significant at the 1% level.

## Conclusion

This paper analyzes the role of corporate real estate ownership in the corporate takeover market for four countries. To measure corporate real estate values, a proxy is employed that has not been used before in the literature. The measure is the book value of property assets, which is a much more accurate reflection of property value than the property plant and equipment variable that has been used hitherto.

Unlike Ambrose (1990), this study does not find a consistent statistically significant and positive relationship between corporate real estate holdings and the chance of becoming a takeover target for the sample as a whole. Rather, this relationship is found to depend on country, sample period, property type, the industry the target is active in, and the nature of the takeover. The association between real estate holdings and takeover likelihood is very country-specific, and ranges from positive to negative according to country. The nature of the country effects causing these results are examined and suggest that property transfer taxes are unlikely to drive the reported differences. Property market circumstances, on the other hand, do seem to have some influence on the relation between real estate ownership and takeover likelihood.

Lastly, informed buyers of corporations (i.e., those active in the same sector as their targets), are found to be more likely to be triggered by the presence of real estate assets than buyers from other sectors. This suggests that underpricing of corporate property assets may still be present, but that it may be hard to spot.

To investigate these issues more deeply, it would be advisable to do a clinical analysis of a smaller sample of takeovers, and study in greater detail the role corporate real estate has played in these transactions. This way, more insights can be gained in the market values and exact nature of the properties sold, the dynamics of the property holdings before and after the takeover, and managerial motivation driving the decisions. Besides that, it may be interesting to study the role of corporate real estate in takeovers in countries besides those investigated in this paper, especially those in Asia-Pacific.

## Appendix

### Variable Definitions

Variable	Definition
Return On Assets	Net Income divided by the average total assets over the year, in %.

Variable	Definition
Sales Over Assets	Net Sales (gross sales and other operating revenue less discounts, returns and allowances) divided by Total Assets (the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets).
Growth in Sales	Current year's Net Sales divided by last year's Net Sales, in %.
Average Liquidity Ratio	The ratio of Net Liquid Assets (cash plus marketable securities less current liabilities) to Total Assets, in %.
Cash Holding Over Assets	Total Cash (money available for use in the normal operations of the company. It is the most liquid of all of the company's assets) divided by Total Assets (the sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets), in %.
Debt-to-Equity Ratio	Long-Term Debt divided by Common Equity, in %.
Book Value of Assets	Sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets.
The Price-Earnings Ratio	The firm's end-of-year Stock Price divided by its Earnings Per Share, in %.
Dividend Yield Ratio	Dividends Per Share divided by the Market Price-Year End, in %.
Price-to-Book Ratio	Market Price-Year End divided by the Book Value Per Share, in %.
Average Excess Stock Return	The excess of a firm's annual total return over the risk-free rate
Real Estate Over Assets	The ratio of Buildings (the architectural structure used in a business such as a factory, office complex or warehouse) and Total Assets, in %.
Growth in Real Estate	Percentage change in Buildings over two consecutive years, in %.

---

## Endnotes

- <sup>1</sup> See *Financial Times*, May 9, 2005, p. 29.
- <sup>2</sup> See *Financial Times*, March 24, 2005, p. 31.
- <sup>3</sup> Rodriguez and Sirmans (1996) provide a comprehensive overview of the most relevant literature.
- <sup>4</sup> An alternative is to use a logit model, in which  $F(X_i)$  is given by the cumulative logistic probability function. Logit and probit models generally give similar results, as is outlined by Espahbodi and Espahbodi (2003). Unreported results show that the choice of a logit instead of a probit model does not materially affect the results of the analysis either.
- <sup>5</sup> Excluding time dummies does not lead to notable changes in the regression results. More results are available from the authors to illustrate this point.
- <sup>6</sup> See, for example Ambrose (1990), Seiler, Chantrath, and Webb (2001), Deng and Gyourko (2003), and Brounen and Eichholtz (2004).
- <sup>7</sup> More extensive statistics regarding the global levels and trends in corporate real estate ownership can be found in Brounen and Eichholtz (2004).
- <sup>8</sup> A list of explicit definitions of all control variables is presented in the Appendix.
- <sup>9</sup> Correlation statistics were calculated for the independent variables to check for the potential presence of multicollinearity in the multiple probit regressions. The correlations are generally relatively close to zero and statistically insignificant. This implies that a simultaneous analysis of the explanatory variables is statistically feasible.
- <sup>10</sup> Similar results are obtained when unadjusted real estate over assets is included as an explanatory variable.

---

## References

- Alvayay, J.R., R.C. Rutherford, and W.S. Smith. Tax Rules and the Sale Leaseback of Corporate Real Estate. *Real Estate Economics*, 1995, 23, 207–38.
- Ambrose, W.B. Corporate Real Estate's Impact on the Takeover Market. *Journal of Real Estate Finance and Economics*, 1990, 3:307–22.
- Ambrose, W.B. and W.L. Megginson. The Role of Asset Structure, Ownership Structure, and Takeover Defenses in Determining Acquisition Likelihood. *Journal of Financial and Quantitative Analysis*, 1992, 27, 575–89.
- Andrade, G., M. Mitchell, and E. Stafford. New Evidence and Perspectives on Mergers. *Journal of Economic Perspectives*, 2001, 15, 103–20.
- Arthur Andersen and Company. *Real Estate in the Corporation: The Bottom Line from Senior Management*. San Francisco, California, 1993.
- Barnes, P. Predicting UK Takeover Targets: Some Methodological Issues and an Empirical Study. *Review of Quantitative Finance and Accounting*, 1999, 12, 283–301.
- Booth, G.G., J.L. Glascock, and S.K. Sarkar. A Reexamination of Corporate Sell-offs of Real Estate Assets. *Journal of Real Estate Finance and Economics*, 1996, 12, 195–202.
- Brennan, M.J. Presidential Address: Latent Assets. *Journal of Finance*, 1990, 45, 709–30.
- Brounen, D. and P.M.A. Eichholtz. Development Involvement and Property Share Performance—International Evidence. *Journal of Real Estate Finance & Economics*, 2004, July, 79–97.

- . Corporate Real Estate Ownership Implications; International Performance Evidence. *Journal of Real Estate Finance and Economics*, 2005, 30, 429–45.
- Brueggeman, W.B., J.D. Fisher, and D.M. Porter. Rethinking Corporate Real Estate. *Journal of Applied Corporate Finance*, 1990, 3, 572–83.
- Clark, K. and E. Ofek. Mergers as a Means of Restructuring Distressed Firms: An Empirical Investigation. *Journal of Financial and Quantitative Analysis*, 1994, 29, 541–65.
- Deng, Y. and J. Gyourko. Real Estate Ownership by Non-Real Estate Firms: An Estimate of the Impact on Firm Returns. Working paper. Wharton School, 1999.
- Espahbodi, H. and P. Espahbodi. Binary Choice Models and Corporate Takeover. *Journal of Banking and Finance*, 2003, 27, 549–74.
- Ezzell, J.R. and P.P. Vora. 2001. Leasing versus Purchasing: Direct Evidence on a Corporation's Motivations for Leasing and Consequences of Leasing. *Quarterly Review of Economics and Finance*, 2001, 41, 33–47.
- Fisher, L.M. The Wealth Effects of Sale and Leasebacks: New Evidence. Working paper. Massachusetts Institute of Technology, 2004.
- Glascok, J., W. Davidson, and C.F. Sirmans. An Analysis of the Disposition and Acquisition of Real Estate Assets. *Journal of Real Estate Research*, 1989, 4, 131–40.
- . The Gains from Corporate Selloffs: The Case of Real Estate Assets. *Journal of the American Real Estate and Urban Economics Association*, 1991, 19, 567–82.
- Hite, G.L., J. Owers, and R. Rogers. The Market for Interfirm Asset Sales, Partial Sell-offs and Total Liquidations. *Journal of Financial Economics*, 1987, 18, 229–52.
- Jensen, M.J. and R.S. Ruback. The Market for Corporate Control: The Scientific Evidence. *Journal of Financial Economics*, 1983, 11, 5–50.
- Liow, K.H. Corporate Real Estate and Stock Market Performance. *Journal of Real Estate Finance and Economics*, 2004, 29, 119–40.
- Liow, K.H. and T.L. Ooi. Does Corporate Real Estate Create Wealth for Shareholders? *Journal of Property Investment and Finance*, 2004, 22, 386–400.
- Mitchell, M.L. and J.H. Mulherin. The Impact of Industry Shocks on Takeover and Restructuring Activity. *Journal of Financial Economics*, 1996, 41, 193–229.
- Myer, F.C., L. He, and J.R. Webb. 1992. Sell-Offs of U.S. Real Estate: The Effect of Domestic versus Foreign Buyers of Shareholder Wealth. *Journal of the American Real Estate and Urban Economics Association*, 1992, 20, 487–500.
- Palepu, K.G. Predicting Takeover Targets: A Methodological and Empirical Analysis. *Journal of Accounting and Economics*, 1986, 8, 3–35.
- Rodriguez, M. and C.F. Sirmans. Managing Corporate Real Estate: Evidence from Capital Markets. *Journal of Real Estate Literature*, 1996, 4, 13–36.
- Rutherford, R.C. Empirical Evidence on Shareholder Value and the Sale-Leaseback of Corporate Real Estate. *Journal of the American Real Estate and Urban Economics Association*, 1990, 18, 522–29.
- . The Impact of Sale-Leaseback Transactions on Bondholder and Shareholder Wealth. *Review of Financial Economics*, 1992, 2, 75–80.
- Rutherford, R.C. and H.O. Nourse. The Impact of Corporate Real Estate Unit Formation on the Parent Firm's Value. *Journal of Real Estate Research*, 1988, 3, 73–84.
- Seiler, S.J., A. Chantrath, and J.R. Webb. Real Asset Ownership and the Risk and Return to Stockholders. *Journal of Real Estate Research*, 2001, 22, 199–212.

Slovin, M.B., M.E. Sushka, and J.A. Polonchek. Corporate Sale-and-Leaseback and Shareholder Wealth. *Journal of Finance*, 1990, 45, 289–99.

Veale, P. Managing Corporate Real Estate Assets: Current Executive Attitudes and Prospects for an Emergent Management Discipline. *Journal of Real Estate Research*, 1989, 4, 1–22.

Wruck, K.H. Financial Distress, Reorganization, and Organizational Efficiency. *Journal of Financial Economics*, 1990, 27, 419–44.

Zeckhauser, S. and R. Silverman. Rediscover Your Company's Real Estate. *Harvard Business Review*, 1983, 61, 111–17.

*We sincerely appreciate the generous financial support from Deloitte. Furthermore, we would like to thank Brent Ambrose, Shaun Bond, Yongheng Deng, Bob Edelstein, Joop Kluit, two anonymous referees, and all participants of the 2005 Cambridge Maastricht Symposium on Real Estate Investment for their constructive inputs.*

---

*Dirk Brounen, RSM Erasmus University, 3000 DR Rotterdam, The Netherlands or dbrounen@rsm.nl.*

*Mathijs van Dijk, RSM Erasmus University, 3000 DR Rotterdam, The Netherlands or madijk@rsm.nl.*

*Piet Eichholtz, Maastricht University, Maastricht 6200 MD, The Netherlands or life@finance.unimaas.nl.*

