



American Finance Association

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Source: *The Journal of Finance*, Vol. 46, No. 3, Papers and Proceedings, Fiftieth Annual Meeting, American Finance Association, Washington, D. C., December 28-30, 1990 (Jul., 1991), pp. 825-844

Published by: Blackwell Publishing for the American Finance Association

Stable URL: <http://www.jstor.org/stable/2328544>

Accessed: 25/11/2009 12:10

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The Role of Acquisitions in Foreign Direct Investment: Evidence from the U.S. Stock Market

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ABSTRACT

This paper examines foreign direct investment by studying shareholder wealth gains for 1273 U.S. firms acquired during the period 1970–1987. Three findings stand out. First, cross-border takeovers are more frequent in research and development intensive industries than are domestic acquisitions; furthermore, in three-fourths of cross-border transactions the buyer and seller are in related industries. These industry patterns suggest that costs and imperfections in product markets play an important role in foreign direct investment. Second, targets of foreign buyers have significantly higher wealth gains than do targets of U.S. firms. This cross-border effect is comparable in size to the wealth effects of all-cash and multiple bids, two effects receiving substantial attention in the finance literature, and is robust to inclusion of these two variables. Third, while the cross-border effect on wealth gains is not well explained by industry and tax variables, it is positively related to the weakness of the U.S. dollar, indicating a significant role for exchange rate movements in foreign direct investment.

THE UNITED STATES HAS INCREASINGLY become the recipient of Foreign Direct Investment (FDI) as foreign corporations purchase U.S. companies or establish new plants on U.S. soil. For example, in 1972 the book value of the total FDI position in the U.S. was under \$15 billion, less than 20 percent of the U.S. position abroad. By 1989 the FDI position in the U.S. exceeded \$400 billion and was 7 percent larger than the size of the U.S. position in other countries.¹ The primary route for this surge in FDI has been through

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¹ By the mid 1980's foreign-owned firms accounted for 3.5 percent of U.S. nonbank employment. The role of foreign ownership was even higher in manufacturing; in 1986 foreign affiliates accounted for 7.8 percent of total U.S. manufacturing employment and 9.9 percent of U.S. manufacturing sales. Figures on FDI are from the U.S. Department of Commerce. Since such figures are based on a historical cost basis they understate the actual value of the positions. This understatement is likely more pronounced for U.S. FDI abroad since it was in place for a longer period but does not alter the conclusion that FDI in the U.S. is increasingly important. Figures on employment and sales are from Anderson (1988).

cross-border acquisitions which have become a significant portion of U.S. takeover activity. W. T. Grimm reports that in the last half of the 1980's, foreign acquisitions of U.S. firms exceeded \$170 billion, 17 percent of total U.S. takeover activity during that period.

What drives foreign purchases of U.S. firms? Are such cross-border acquisitions driven by tax benefits as argued by some (Scholes and Wolfson (1990))? Are they spurred by exchange rate movements (Froot and Stein (1989))? Or are they essentially indistinguishable from purely domestic U.S. takeovers that have been studied widely? This paper addresses these and other questions with an empirical study of 1273 purchases of publicly-traded U.S. firms, almost all New York or American Stock Exchange firms acquired during the period 1970–1987. Unlike most prior research on FDI, which has focused on the level of investment flows or the behavior of multinational enterprises (see for example, Agmon and Lessard (1977), Errunza and Senbet (1981), Arpan, Flowers, and Ricks (1981), Rugman (1983), Caves and Mehra (1986), Benvignati (1987), and Froot and Stein (1989)), the current investigation employs share price data on target firms in both cross-border and domestic takeovers. Despite the extensive literature on wealth effects in domestic acquisitions (see Jensen and Ruback (1983) and Jarrell, Brickley, and Netter (1988)), to date there is scant evidence on such effects in cross-border takeovers. As a result our work is the first comprehensive study of wealth gains to U.S. targets in cross-border takeovers.

Use of share price data provides a number of advantages. First, the resulting tests supplement those available from using aggregate levels of activity. These additional tests are particularly important given difficulties in obtaining comprehensive, high quality data on levels of FDI. Second, share price data allow comparison of returns (value creation) from cross-border transactions to those on purely domestic takeovers. Such comparison provides insights on any differences in benefits from similar types of investments. Third, use of wealth effects allows study of transaction-specific variables such as industry structure or competition in bidding. Such cross-sectional investigation provides additional evidence on motivations for cross-border transactions while at the same time providing a link to a vast empirical literature on domestic acquisitions.

I. Reasons for Cross-Border Takeovers

There is an extensive literature on the motivations for corporate mergers (Jensen (1986) and Ravenscraft (1988)). Possible differences between cross-border and domestic takeovers are important for our work. Competing hypotheses about the forces driving cross-border takeovers include 1) imperfections and costs in product or factor markets, 2) biases in government and regulatory policies, and 3) imperfections and information asymmetries in capital markets.

A. Imperfections and Costs in Product and Factor Markets

Traditional models with perfect capital mobility and perfect capital markets provide no rationale for cost of capital advantages to either domestic or foreign investors (Froot and Stein (1989)). As a result, following the pioneering work of Hymer (see Dunning and Rugman (1985) and Dunning (1988)), there is a growing literature stressing that FDI results from imperfections and costs in product and factor markets (see Krugman (1987) for an overview). These imperfections and costs give rise to multinational enterprises which may pursue foreign acquisitions to capitalize on monopoly rents or internalize actions that are costly to transact through the market mechanism (Williamson (1988) and Teece (1985)). As a result, certain domestic assets may be worth more to a foreign buyer than a domestic purchaser.

Consistent with the increasingly important role of intraindustry trade (not explained by traditional ideas of comparative advantage), this new trade theory stresses the role of economies of scale, market imperfections, and spillover effects in understanding FDI. This industrial organization view of multinational activity has identified research and development intensive operations and differentiated products as logical candidates for FDI. Research and development plays a central role for three reasons. First, R&D creates both a barrier to entry and monopoly power through patents. Second, the market is often inefficient in the transfer of technological information since the sale or licensing of specialized knowledge may disclose important competitive information or be difficult for complex technologies. This may make multinational operation essential to transfer technologies to other countries. Third, the ability to spread the fixed costs of R&D over a number of national markets may yield an important cost advantage, especially in countries with markets of limited size or in product lines, such as the pharmaceutical industry, where R&D is a substantial part of total cost. Advantages to foreign acquisition may also exist when the product differentiation requires a large selling effort on the part of the producer due to vertical integration of production and selling. Foreign firms may find it difficult to produce abroad and set up a domestic distribution channel.

B. Biases in Government and Regulatory Policies

Another set of explanations for cross-border transactions do not focus on the inherent business of a firm but rather on the regulatory and policy environment. Tariff and trade policy can have substantial effects on incentives for cross-border transactions. Facing prohibitive tariffs or the threat of import restrictions, a foreign firm may purchase manufacturing capacity in the U.S. rather than be an importer. Furthermore, differences in accounting regulations are sometimes claimed to favor foreign buyers. As an example, generally accepted accounting principles require U.S. firms to amortize goodwill against earnings (with no tax benefits) whereas rules in other countries do not require this amortization.

Even if accounting cosmetics have little or no effect, there can be substantial tax effects in takeovers. Scholes and Wolfson (1990) argue that changes in U.S. tax laws have had a substantial impact on the incentives both for mergers between U.S. firms and for purchase of U.S. firms by foreign buyers. Specifically, the 1981 Economic Recovery Tax substantially increased tax incentives for U.S. takeovers by U.S. firms (both absolutely and relative to foreign acquisitions of U.S. firms). These incentives included accelerated depreciation schedules that could only be obtained upon acquisition of assets and hence created an incentive for takeover. However, the 1986 Tax Reform Act neutralized most, if not all, of these advantages. Scholes and Wolfson (1990, p. S156) argue that after 1986 foreign investors should find investment in the U.S. more attractive than before and that such investors "may place a higher value on the assets held by U.S. investors than U.S. investors place on them." As a result, the tax advantages of U.S. buyers relative to foreign buyers should have increased after 1981 and dropped after 1986. Using aggregate data Scholes and Wolfson show foreign takeovers of U.S. firms decreased around 1981 and surged with the 1986 Act consistent with their tax hypotheses.

C. Imperfections and Asymmetries in Capital Markets

An alternative explanation for the pattern in takeovers observed by Scholes and Wolfson is offered by Froot and Stein (1989) who develop a model linking cross-border takeovers to exchange rate movements. They argue that given information asymmetries about an asset's payoffs, entrepreneurs find it impossible or very costly to purchase the asset solely with externally obtained funds. As a result, "information intensive" investments, such as buying a company, will be partially financed by the net wealth of the entrepreneur. Since the relative net wealth of foreign versus U.S. entrepreneurs will vary with exchange rates, Froot and Stein's model predicts that foreign buyers will have a purchasing advantage when their currency is strong against the dollar. Given the strength of the dollar in the early 1980's and its weakening in 1986 and thereafter, this argument provides an alternative rationale for the lull and subsequent surge of cross-border takeovers noted by Scholes and Wolfson. The Froot and Stein argument is a more sophisticated version of a view quite prominent in the popular press, that cost of capital advantages favor foreign buyers.

II. Wealth Effects in Domestic and Cross-Border Takeovers

To provide insights into which, if any, of the hypothesized forces drive cross-border takeovers, we examine share returns. Ideally, an analysis of wealth gains would include gains to buyers; however, this would require share returns for buyers from a large number of different countries. Unfortu-

nately, this is not possible since our share data are restricted to U.S. firms. As a result, we rely on target wealth gains.²

Prior empirical work on domestic takeovers suggests that target firms reap the lion's share, if not all, of the takeover gains. Surveying evidence on U.S. takeovers, Jensen and Ruback (1983) and Jarrell, Brickley, and Netter (1988) find small, if any, gains to acquiring firms. Franks and Harris (1989) echo this conclusion for the U.K. Doukas and Travlos (1988) find, on average, no gains to U.S. firms expanding abroad through acquisition. The literature thus suggests that target gains likely capture a large portion of the wealth gains available in cross-border acquisitions.

Unfortunately, there is little evidence on wealth gains to U.S. targets in cross-border takeovers. While Doukas and Travlos (1988) study the effects of U.S. purchases of foreign firms, they provide no evidence on U.S. targets. Conn and Connell (1986) study shareholder gains to both buyers and sellers in mergers between U.K. and U.S. firms and find no conclusive evidence on gains or losses to buyers. Whereas, Conn and Connell show that targets in the U.K. and U.S. both earn substantial gains, the study provides no direct evidence on how these gains compare to those in domestic acquisitions. Furthermore, the sample is small (23 U.S. targets and 25 U.K. targets) which prevents any tests of cross-sectional variation in target gains.³

Our first set of tests then are simply to see if there are any differences in target wealth gains between domestic and cross-border acquisitions. Given prior empirical findings of a strong positive association between target gains and both all-cash offers and competition in bidding (e.g., see Bradley, Desai, and Kim (1988) and Franks, Harris, and Mayer (1988)), we test to see if any differences between cross-border and domestic takeovers persist once we control for these factors. We also explore whether a "cross-border effect" persists when we control for variation in wealth effects over time and across industries.

² The wealth gains help reveal the bidder's motivation for acquisition. Whether the bidder's perceptions are accurate is another issue. This depends on the existence of hubris (see Boebel and Harris (1989)) and the relationship between *ex ante* perceptions and *ex post* performance (see Ravenscraft and Pascoe (1989)). A full resolution of how the wealth gain is distributed between bidder and target in cross-border takeovers requires stock data from a number of countries. For our purposes, we only need to assume that a statistically significant part of the gain is captured by target shareholders and that the distribution of the gain is not correlated with our independent variables. Since foreign bidders must compete with other domestic and foreign bidders and since target management and shareholders can reject inadequate offers even in the absence of competition, target shareholders will almost surely share in the gain. As noted, the available evidence suggests that target shareholders receive almost all the gain even in cross-border acquisitions. Nevertheless, our estimate yields a lower bound on the total gain, unless the bidding foreign firm incurs a loss in share value. Declines in bidder share value have been observed, but Franks, Harris, and Mayer (1988) show they are largely confined to stock acquisitions. Most cross-border takeovers employ cash.

³ A number of authors are currently investigating wealth effects in cross-border acquisitions, e.g., Servaes and Zenner (1990).

A second set of tests examine whether any variation in wealth effects in cross-border takeovers can be explained based on competing hypotheses about the benefits of FDI. As outlined earlier, such benefits may arise from imperfections and costs in product or capital markets or from biases in government and regulatory policy.

III. Sample and Methodology

A. Sample

The sample is a comprehensive set of U.S. firms listed on the New York or American stock exchanges which were acquired during the period 1970–1987 and for which necessary data were available. Each takeover is classified as either domestic (U.S.) or cross-border based on the nationality of the acquirer using data from *The Wall Street Journal* (WSJ), *Ward's Business Directory of Largest U.S. Companies, 1987*, *Ward's Business Directory of Major International Companies, 1985*, *Principal International Business: The World Marketing Directory, 1988*, and *Who Owns Whom: Australia & Far East; Continental Europe; North America; and United Kingdom & Republic of Ireland, 1988*. We also recorded the country in which the acquirer is based. While there are a number of possible ways to determine a firm's nationality (e.g., ownership, revenues, charter), our classification uses the nation in which the acquirer has its home office. The resultant sample contains 1114 domestic U.S. acquisitions and 159 cross-border acquisitions. For each takeover, bid dates were obtained from *The WSJ Index*. To measure possible competition in the bidding market *The WSJ Index* was used to determine whether there were multiple bids for the target (bid revisions or multiple bidders). For each acquisition the means of payment was determined using the *Commercial Clearing House Capital Changes Reporter*. Stock returns and market values were obtained from the Center for Research in Security Prices (CRSP) daily files.

B. Measurement of Wealth Gains

To assess the effects of takeovers on share prices we use event study methodology. For any company j we define an abnormal return (ar_{jt}) as

$$ar_{jt} = r_{jt} - c_{jt}, \quad (1)$$

where r_{jt} is the continuously compounded realized return on day t , c_{jt} is a control return which calculates an estimate of what shareholder returns would have been in the absence of a takeover, and t measures time relative to the event date ($t = 0$). Brown and Warner's (1985) simulation results suggest that in most cases relatively straightforward procedures are as powerful as more elaborate tests in detecting abnormal returns. We use the market model which defines the control return as $c_{jt} = \alpha_j + \beta_j rm_t$ where α and β are estimated by regressing the individual firm return r_{jt} on the

market return rm_t for the 220-day period ending 21 days before the first bid for the target.⁴

We construct company-specific "cumulative abnormal returns" (car_j) between any two dates t_b and t_a as

$$car_j = \sum_{i=t_b}^{i=t_a} ar_{ji}. \quad (2)$$

In measuring car values, two alternative window lengths are employed. A broad 5-week window cumulates returns from day -20 to day $+4$. A narrower one-week window sets $t_b = -3$ and $t_a = +1$.

Unfortunately, an acquisition does not always involve a single clean announcement. To capture the complexities of the bidding process, three announcement dates were compiled from the *WSJ*: 1) the first offer for the target by any bidder, 2) the first offer for the target by the ultimate acquirer, and 3) the final offer by the ultimate acquirer. In two-thirds of the acquisitions these three announcements are identical. If there are multiple bidders and the ultimate acquirer revises its initial bid, the three announcements will be distinct.

In order to measure price reactions to a series of offers we report car based on multievent windows spanning all announcements. As an example, for the broad event window car includes daily returns beginning 20 days prior to the first announcement date and going through 4 days thereafter *plus* all subsequent daily returns falling 20 days before through 4 days after any of the other two announcement dates. The narrow window repeats the process but uses days -3 through $+1$. In essence these multievent windows cumulate any value gains across all the important information releases.⁵

As a supplement to our wealth gains we also collected bid premiums tabulated by W. T. Grimm for the years 1976–1989. Grimm measures the premium as the percentage spread between the transaction price and the stock price shortly before the bid announcement. While covering a large universe of firms (2,877 domestic takeovers and 472 cross-border acquisitions for the 14-year period), Grimm only reports annual averages across transactions.

C. Product Market Variables

For each target, we measure two dimensions of its industry's activity: research and development (R&D) and selling expenses. These two items are expressed as a proportion of sales and taken from the *FTC's Annual Line of*

⁴ We required at least 20 days of data to calculate parameters of the market model. When we dropped all firms with less than 50 days of data to calculate market model parameters, there was almost no effect on our regression results and no change in our conclusions.

⁵ Such a procedure may overestimate gains (if there are price drops after a failed bid which are recouped later) when another bid surfaces after a substantial lag.

Business Report, 1977. Companies in manufacturing were matched to industry data at the four-digit level when possible, though in some instances two- or three-digit matches were required. Nonmanufacturing companies were matched at the two-digit level.

D. Tax Variables

Given the potential importance of the 1981 and 1986 tax changes in the U.S., we construct two dummy variables to capture these effects. TAX81 takes on the value of unity in the years 1981 through 1986 and is zero otherwise. TAX86 takes on the value of one in 1987 and is zero otherwise. Since the tax benefits of a transaction typically depend upon when it is consummated rather than announced, for purposes of creating these dummies we assigned takeovers to years based on when the target firm's stock ceased trading rather than announcement dates.

E. Exchange Rate Variables

We measure the strength of the buyer's home currency relative to the U.S. dollar as the proportionate deviation from the average exchange rate for the sample period. Based on the home country of each buyer, we take the currency's average exchange rate (units of foreign currency per dollar) for the sample period 1970–1987 and subtract the currency's exchange rate for the year of the takeover. The variable *EXR* is defined and constructed as this difference divided by the average exchange rate.⁶ As a result, positive (negative) values indicate the currency is strong (weak) relative to the U.S. dollar.

We also developed exchange rate measures based on deviations from purchasing power parity using the work of Summers and Heston (1988). A value above (below) 100 would indicate that goods and services are more (less) expensive in the foreign country than in the U.S. To measure the strength of a currency at the time of a cross-border takeover, we measure the deviation of that currency in the takeover year from 100. As an alternative we calculate the deviation in the takeover year from its average over our sample period.⁷

F. Other Variables

Some FDI benefits, like spreading R&D costs and extending competitive advantage, require a close tie between the business units of the target and bidder. A foreign buyer with existing presence in the target's product lines is

⁶ We define the merger year as the year of the first announcement date. For measuring *EXR* we used the exchange rate for the merger year if the merger were after June. If the merger were before June, we used the exchange rate from the year before the merger.

⁷ Since Summers and Heston's data end in 1985 we obtain more recent data from the OECD who provide similar estimates. For a few countries, values were only available for the 1980's.

also in a better position to capitalize on market imperfections in the target's industry. Other benefits of FDI may result from learning more about the business environment in the U.S. In this regard, we would expect that a new acquisition would be less valuable to a buyer if the buyer already has U.S. operations.

For cross-border takeovers, we measured the bidding firm's experience in the target's industry and in the U.S. The bidding firm's expertise in a line of business was determined from the relatedness of business units of the target and bidder. Based on product descriptions given in the *WSJ* announcements of the cross-border takeovers, acquisitions were classified as horizontal, closely related (including vertical), or conglomerate. Initial experiments suggested that the impact of horizontal and closely related acquisitions on wealth gains were similar; therefore, they were combined into a single zero-one dummy variable *RELAT* that takes on the value of one if the buyer already had operations in the target's line of business (or a closely related business). The *WSJ* account was also used to identify existing U.S. operations by the bidder. The zero-one dummy variable *USOP* equals one if the bidder had a clear U.S. presence at the time of the acquisition announcement. Subsidiaries set up for the purpose of making the acquisition were not considered to be evidence of a U.S. presence.⁸ Table I summarizes the variables used, including brief definitions and acronyms.

IV. Results

A. Sample Characteristics

Foreign acquisitions of U.S. firms comprise about 12.5 percent of our sample of 1273 takeovers. As shown in Panel A of Table II, 0.38 of the targets were acquired by U.K. firms and 0.21 by Canadian companies; the remainder of the buyers are spread among Europe, Asia, and elsewhere. In our sample, foreign takeovers peaked in the late 1970's with approximately one-third of the 159 cross-border takeovers occurring in the 3-year period 1977–1979. In 1979, almost one in five takeovers was by a foreign firm. This parallels the peak of FDI in the U.S. generally prior to the recession of the early 1980's and the rise in the U.S. dollar. After a lull of 5 years, cross-border takeovers again increased in the mid 1980's; about one-fourth of our sample falls in the period 1985–1987. This latest increase may be in part due to the weakening of the U.S. dollar or to 1986 tax legislation.

Not surprisingly, as shown in Panel B of Table II foreign buyers primarily use cash bids since they typically do not have equity traded in U.S. markets.

⁸ For roughly ten percent of the cross-border sample, no information was available on relatedness or U.S. presence. For these observations, the *RELAT* or *USOP* variable was assumed to be zero. To test this assumption, an additional dummy variable was included if the value of the variable was unknown. For both measures, this dummy variable was insignificant and its inclusion had little impact on the *RELAT* and *USOP* coefficients.

Table I
Variable Definitions

<i>CAR</i>	= the wealth gain to target firm around the takeover announcement date
<i>CROSS</i>	= a zero-one dummy variable taking on the value of 1 if the buyer is not a U.S. firm, 0 otherwise
<i>CASH</i>	= a zero-one dummy variable taking on the value of 1 if the takeover bid is all cash, 0 otherwise
<i>MULTI</i>	= a zero-one dummy variable taking on the value of 1 if the bid is revised or contested, 0 otherwise
<i>USOP</i>	= a zero-one dummy variable taking on the value of 1 if the buyer has U.S. operations prior to the takeover, 0 otherwise
<i>RELAT</i>	= a zero-one dummy variable taking on the value of 1 if the buyer already has operations in the target's lines of business or a closely related business, 0 if the acquisition is conglomerate in nature
<i>R&D</i>	= research and development expense divided by sales for the target's industry, measured at the 4-digit level where possible
<i>SELL</i>	= total selling expenses (media advertising and other selling) divided by sales for the target's industry, measured at the 4-digit level where possible
<i>TAX81</i>	= a zero-one dummy variable taking on the value of 1 while the 1981 Economic Recovery Act was in effect (1981-1986), 0 otherwise
<i>TAX86</i>	= a zero-one dummy variable taking on the value of 1 after the 1986 Tax Reform Act was in effect (1987), 0 otherwise
<i>EXR</i>	= the proportionate deviation of the buyer's home currency in the merger year from its average relationship to the U.S. dollar. A positive value suggests the currency is strong relative to the dollar

Eighty-eight hundredths of cross-border acquisitions were all cash bids as opposed to 0.49 in domestic U.S. takeovers. Cross-border takeovers are slightly less likely to involve multiple bids (0.30 of cases) than are domestic takeovers (0.33). Given prior empirical findings of a strong positive association between target wealth effects and both all-cash offers and multiple bids, (e.g., see Bradley, Desai, and Kim (1988) and Franks, Harris, and Mayer (1988)), these differences between cross-border and domestic takeovers make it especially important to control for these characteristics in testing for differences in wealth effects.

There are also important industry differences between cross-border and domestic takeovers. Cross-border takeovers are more often in the manufacturing sector (66 percent of the foreign sample) than are domestic takeovers (52 percent). Table II shows that cross-border takeovers are, on average, in more R&D intensive industries and in industries with higher selling expenses than are domestic takeovers. The R&D intensity of 0.0173 in cross-border takeovers is significantly higher than the 0.0117 figure in domestic acquisitions ($t = 2.90$). The difference in selling expenses between foreign (0.0984) and domestic (0.0855) takeovers is also statistically significant ($t = 2.13$). The R&D differences are not attributable to the higher proportion of cross-border takeovers in the manufacturing sector. When we restricted the sample to manufacturing takeovers only, cross-border takeovers have significantly higher R&D than do domestic takeovers. The selling intensity

Table II
Country, Industry and Bid Characteristics of Cross-Border
and Domestic Takeovers of U.S. Firms, 1970–1987

	Cross-Border Takeovers N = 159	Domestic Takeovers N = 1114
Panel A: Home Country of Buyer		
Entry is proportion of sample		
U.S.	0	1.0
U.K.	0.38	0
Canada	0.21	0
Europe (non-U.K.)	0.29	0
Other	0.12	0
Panel B: Bid Characteristics		
Entry is proportion of sample		
All Cash	0.88	0.49
All Equity	0.04	0.28
Multiple Bids	0.30	0.33
Panel C: Industry Characteristics		
Entries are Mean (Std. Dev.)		
R&D/Sales	0.0173 (0.0237)	0.0117 (0.0172)
Other Selling Expenses/Sales	0.0984 (0.0725)	0.0855 (0.0702)
Panel D: Previous Bidder Experience in U.S. & Target Industries		
Entry is mean value		
USOP	0.52	
RELAT	0.72	

difference, however, disappears when we restrict the sample to manufacturing.⁹

Panel D of Table II shows that 0.52 of the buyers in cross-border takeovers already had some U.S. operations. Furthermore, in almost three-fourths of the cross-border takeovers, the buyer already had operations in lines of business closely related to those of the target. The data thus display that FDI through acquisition is most often in an area in which the buyer has business expertise.

B. Wealth Gains: Cross-Border versus Domestic Takeovers

Table III presents regression results to explain cross-sectional variation in target wealth gains. Since the dependent variable (*car*) is measured with

⁹ There were 105 cross-border takeovers and 579 domestic takeovers in manufacturing. For the manufacturing subset, R&D was 2.40 percent in cross-border takeovers versus 1.93 percent in domestic takeovers ($t = 2.15$). For selling expenses, the figures were 9.76 percent for cross-border and 9.17 percent for domestic ($t = 0.80$).

Table III
Regression Analysis of U.S. Target Wealth Gains
in Domestic and Cross-Border Takeovers

Sample includes 1273 U.S. targets, 1970–1987. Entries are coefficient estimates with *t*-values in parentheses. All equations are significant at the 1% level.

Regressions	(1)	(2)	(3)	(4)
Intercept	0.2633 (39.83)	0.1839 (18.77)	– ^a	– ^a
CROSS	0.1344 (7.03)	0.1020 (5.41)	0.0788 (4.30)	0.0929 (4.80)
CASH		0.0821 (6.62)	0.0951 (7.44)	0.0772 (6.10)
MULTI		0.1019 (8.22)	0.1129 (9.47)	0.1048 (8.37)
YEAR DUMMIES			F = 9.95 ^b	
INDUSTRY DUMMIES				F = 2.01 ^b
R ²	0.04	0.12	0.21	0.16

^aWhile the model is estimated with an intercept, the intercept is the coefficient on the class omitted in assigning dummies.

^bF-test is significant at the 1% level.

error, this may introduce heteroskedasticity into the regressions. To correct for possible heteroskedasticity, regressions are estimated using Generalized Least Squares (GLS) where each observation is divided by the standard error of the market model regression used to estimate control returns. Unless otherwise noted the results shown are robust to the choice of a narrow or broad window; therefore we report only the latter.

The first three variables are zero-one dummies taking on the value of one if the takeover is cross-border, is all cash, or involves multiple bids, respectively. The first regression demonstrates that target wealth gains are significantly higher in cross-border takeovers (0.3977) than in domestic takeovers (0.2633). Furthermore, as shown in the second regression this significant difference persists after controlling for means of payment and the presence of multiple bids. The second regression reveals that the “cross-border” effect (coefficient of 0.1020) is comparable in size to the effects of all cash bids (coefficient of 0.0821) and multiple bids (0.1019), two findings that have received substantial attention in the finance literature.

Since target wealth effects may vary over time and across industries, we reestimated the second regression adding zero-one dummies for each year and also adding dummies for each two-digit SIC grouping.¹⁰ These fixed effect models are reported as the third and fourth regressions. The *F* statistic on

¹⁰ In the “fixed effects” models, no intercept is reported since it represents the coefficient on the arbitrarily chosen class omitted in assigning dummies. In forming dummies, years 70 through 73 were collapsed into one class, given the few cross-border takeovers during those years. SIC groupings used had at least 2 foreign takeovers.

the set of yearly dummies of 9.95 shows that there is a significant (1% level) variation of target wealth effects over time. Nonetheless, the “cross-border” effect (coefficient of 0.0788) remains significantly positive. The positive effects of cash and multiple bids are also robust to the inclusion of yearly dummies. The fourth regression shows a similar pattern: there are significant industry effects (F of 2.01 on the set of industry dummies), but the cross-border, cash, and multiple bid effects are robust to inclusion of these industry patterns. Table III thus provides strong evidence that target wealth gains are significantly higher in cross-border than in domestic takeovers.

As an additional test of a cross-border effect we used bid premium data reported by W. T. Grimm for the years 1976–1989. Grimm provides the average bid premium (percentage that price paid exceeds target price before offer) by year for foreign acquisitions of U.S. firms and for all U.S. acquisitions (domestic and foreign). Since Grimm also provides the number of firms entering the yearly averages it is possible to derive the average annual bid premium in purely domestic transactions. In 10 of the 14 years the foreign premium exceeded the domestic figure. For the 14-year period, there was an average bid premium of 46.4 percent for cross-border takeovers and 41.9 percent for domestic takeovers. The difference of 4.49 percent is significantly different from zero ($t = 2.25$) at the 5% level based on a two-tailed test.¹¹ The Grimm data thus confirm a significant positive cross-border effect.

C. Determinants of the Cross-Border Wealth Effect

Our data demonstrate a strong cross-border effect, suggesting that foreign buyers consistently pay substantially higher premiums for U.S. firms than do U.S. buyers. In this subsection we explore explanations for this difference. First, we examine variables measured for both domestic and cross-border acquisitions. Second, we turn to a more detailed examination of cross-border transactions.

C.1. Cross-Border versus Domestic Takeovers

As a first step we investigate whether the time and industry variations in target gains differ between cross-border and domestic takeovers. To study variation over time, we reestimate the fixed effects model in the third regression of Table III adding interactions between *CROSS* and the year dummies. The F -statistic on the set of interaction terms was 2.17 (significant at the 1% level) suggesting that variation over time is different for cross-border takeovers. Using the narrow event window to measure gains, however, the F value dropped to 0.91. When we repeated the fixed effects procedure to examine industry effects, we again found some evidence of a

¹¹ The averages reported weight each year equally. If each takeover is weighted equally the means are slightly further apart, 46.7 percent for cross-border transactions and 41.2 percent for domestic transactions. The t test is based on the vector of annual differences between cross-border and domestic premia to allow for time series correlation of the data.

difference between effects in cross-border and domestic transactions. Using the broad event window, the F value on the set of industry interactions with *CROSS* was 1.10 but the F increased to 1.65 (significant at the 5% level) using the narrow event window.

To pursue these time and industry effects further, Table IV investigates the role of product market and tax incentives suggested in the literature. Interaction terms between these characteristics and the cross-border dummy provide a test of whether such effects differ when the buyer is foreign rather than domestic.

Higher target wealth gains occur in R&D intensive businesses as shown by the significant positive coefficient on R&D. The coefficient on the interaction term between *CROSS* and R&D is essentially zero, however, showing that the effects of R&D appear the same in both foreign and domestic takeovers. The coefficients on selling expenses and its interaction with *CROSS* are not

Table IV
Regression Analysis of U.S. Target Wealth
Gains in Domestic and Cross-Border
Takeovers

Sample includes 1273 U.S. targets, 1970–1987. Entries are coefficient estimates with t -values in parentheses. All equations are significant at the 1% level.

Regressions	(1)	(2)
Intercept	0.1990 (14.66)	0.2582 (19.20)
<i>CROSS</i>	0.1852 (4.82)	0.2042 (5.11)
<i>CASH</i>	0.0993 (7.73)	
<i>MULTI</i>	0.1152 (9.30)	
<i>R&D</i>	1.1900 (3.11)	1.3353 (3.30)
<i>SELL</i>	−0.0688 (−0.81)	−0.0340 (−0.38)
<i>TAX81</i>	−0.0570 (−4.13)	−0.0125 (−0.90)
<i>TAX86</i>	−0.0480 (−1.69)	0.0136 (.46)
<i>CROSS</i> × <i>RD</i>	0.2892 (.33)	−0.0300 (−0.03)
<i>CROSS</i> × <i>SELL</i>	−0.4647 (−1.77)	−0.1711 (−0.61)
<i>CROSS</i> × <i>TAX81</i>	−0.0879 (−1.79)	−0.0984 (−2.36)
<i>CROSS</i> × <i>TAX86</i>	−0.1542 (−2.28)	−0.1697 (−2.79)
R^2	0.16	0.06

significantly different from zero. The positive link between R&D and target gains is consistent with costs and imperfections in product markets affecting corporate structure. Given that cross-border takeovers occur more often in R&D intensive industries than do U.S. takeovers, these results provide support for a special role of R&D in FDI.

The tax results are more complicated. In the first regression, both tax variables are negatively related to target gains. The negative coefficient of -0.0570 on TAX81 in regression (1) suggests that U.S. target gains dropped after the Economic Recovery Act of 1981. This significant negative effect runs counter to the tax hypothesis which points to important new tax incentives for takeovers in the early 1980's. The second regression provides a less disturbing result for the tax hypothesis. Since a cash offer is typically necessary to reap the asset writeups and increased depreciation tax shields sought in a tax motivated takeover,¹² regression (2) drops the CASH variable as well as MULTI. In that regression, the coefficient of TAX 81 is still negative but not significantly different from zero. The insignificant coefficient on TAX86 also does not confirm the tax hypothesis which would predict lower target gains after the 1986 Act.

Since our sample extends only one year after 1986, it is possible that inclusion of additional years might buttress the tax hypothesis of reduced gains after the 1986 Act. W. T. Grimm bid premium data suggest, however, that such is not the case. For 1987–1989 the average Grimm premium for domestic transactions was 39.8 percent, above the average figure for domestic premiums in each year from 1983 to 1986.

Turning to tax effects in cross-border transactions, the coefficients on interactions of CROSS and the tax variables are significantly negative. The negative sign associated with the 81 Act is expected given that the 81 Act favored U.S. buyers. The negative sign associated with the 86 Act is not, however, consistent with the tax explanation offered by Scholes and Wolfson (1990) predicting a relative advantage for foreign buyers following this Act. W. T. Grimm data also provide no support for an upswing in cross-border target gains after 1986. For cross-border takeovers, the 1987–1989 average Grimm premium was 44.8 percent, lower than three of the six annual averages for cross-border transactions while the 1981 Act was in effect and only slightly higher than the 43.6 average for 1981–1986.

In sum, our results provide no support for increased tax incentives for takeover being linked to higher target gains. One might rationalize some of the results with the tax hypothesis by arguing that the takeover tax benefits were quickly capitalized into target prices upon announcement of the 81 Act and hence are not captured in our measured gains.¹³ Nonetheless, the coefficients on tax variables suggest a drop in U.S. target gains from 1981 onward and that this drop is more pronounced in cross-border acquisitions.

¹² Hayn (1989) and Scholes and Wolfson (1990) provide more detailed discussion of the often complex details surrounding the tax consequences of takeovers.

¹³ See Hayn (1989) for a detailed cross-sectional analysis of tax attributes. Hayn finds specific tax incentives linked to target gains.

Since the tax hypotheses do not provide an adequate explanation, we view the pattern as likely the result of other factors at work in the takeover market. Whatever these factors, the cross-border effect persisted in the 1980's as well as for our entire sample period. We reestimated Table III regressions splitting our sample into the 1980's and before. In both subperiods, the coefficient on *CROSS* remained significantly positive though it was smaller in the latter period. Perhaps this decline is due to more integration of global capital markets.

C.2. Cross-Border Takeovers

To provide further insight into cross-border transactions, we analyze differences among target gains for 159 targets purchased by foreign buyers. In these cases, we measure the potential effects of exchange rate levels and the buyer's previous experience. As a first step we estimate a fixed effects model, introducing dummies for each buyer's country. The *F* value of 1.41 on the set of country dummies is significant at only the 17% level, providing only weak evidence of country effects. In Table V we test for the role of exchange rate levels, tax acts, bidder experience, competition in bidding, and industry characteristics in explaining differences among cross-border takeovers.

The first regression demonstrates that target gains are significantly higher when the buyer's currency is strong relative to the dollar. The coefficient of

Table V
Regression Analysis of U.S. Target Wealth
Gains in Cross-Border Takeovers

Sample includes 159 cross-border acquisitions, 1970-1987. Entries are coefficient estimates with *t*-values in parentheses. All equations are significant of the 1% level.

Regressions	(1)	(2)	(3)	(4)
Intercept	0.4171 (22.38)	0.4754 (17.34)	0.4669 (16.88)	0.4524 (9.10)
<i>EXR</i>	0.2737 (3.28)		0.1636 (1.74)	0.2856 (3.35)
<i>TAX81</i>		-0.1250 (-3.18)	-0.0929 (-2.15)	
<i>TAX86</i>		-0.1445 (-3.00)	-0.1073 (-2.05)	
<i>R&D</i>				1.3032 (1.58)
<i>SELL</i>				0.2979 (-1.05)
<i>RELAT</i>				-0.0480 (-1.18)
<i>USOP</i>				-0.0367 (-1.02)
<i>MULTI</i>				0.0741 (1.92)
<i>R</i> ²	0.06	0.08	0.10	0.12

0.2737 suggests that a 10 percent (0.10) appreciation of a currency is accompanied by a 2.7 point ($0.2737 \times 0.10 = 0.02737$) increase in target gains. This result squares with Froot and Stein's (1989) argument that exchange rate movements impart an advantage to foreign buyers in a world of costly information.¹⁴ Hence such movements play an important role in FDI.

The second regression shows that tax variables are negatively linked to target gains, echoing the finding on the interactions between *CROSS* and the tax dummies in Table IV. As suggested earlier, however, movements of the dollar in the 1980's are coincident with important tax changes. The variable *EXR* is significantly negatively correlated (1% level of significance) with both of the tax dummies. The third regression shows the effects of this colinearity. In that specification, the coefficient and *t* value on *EXR* are reduced; however, the exchange rate effect remains significantly positive at the 5% level (one-tailed test). The magnitude and significance of both tax variables also decline, but they retain their significant negative coefficients. The negative sign on *TAX86* is not consistent with Scholes and Wolfson's (1990) tax argument that foreign buyers would experience advantages after 1986. Combining these results with our earlier discussion of Table IV, we conclude that the tax variables do not provide a coherent explanation for the observed drop in target gains after 1980.

Given the difficulty of interpreting the tax variables, we focus on the fourth regression in Table V. The coefficient of *EXR* remains significantly positive despite the inclusion of the other variables, confirming an important link between exchange rates and FDI. Except for the positive effect of multiple bids, however, none of the other variables are significantly linked to target gains. While the R&D effect is still positive, with the smaller sample size (compared to Table IV) it is no longer significant. Furthermore, neither *USOP* or *RELAT* have significant coefficients.

We also estimated regressions including interactions of R&D with both exchange rate and tax variables. The exchange rate argument should be especially compelling in information intensive industries characterized by high R&D, whereas, many tax benefits are linked to hard asset industries (often low R&D) with high depreciation levels. None of the interaction terms had significant coefficients.¹⁵

¹⁴ When exchange rate measures based on deviations from purchasing power parity were employed they were not as useful in explaining differences in target gains. This lack of explanatory power may suggest that wealth levels rather than prices of goods are important or that measurements of purchasing power parity are noisy.

¹⁵ Our research explored one additional issue not discussed in the text. The FDI theory suggests that imperfect competition stimulates international production. Unfortunately a good proxy for imperfect competition does not exist. Some researchers assume that the four-firm concentration ratio (CR4) reflects monopoly power. However, others have found that it more likely reflects efficiencies of large firms. To see if either efficiency or monopoly played a role, CR4 was included in one regression run. The estimated coefficient on CR4 was not significant. Since CR4 values are available for only manufacturing industries, its inclusion required the deletion of almost half the observations. In general, the results for the manufacturing sample were similar with respect to the variables studied here, although the loss of observations led to statistically weaker results.

V. Summary and Conclusions

This paper studies shareholder wealth gains for 1273 U.S. firms acquired during the period 1970–1987 with a specific focus on differences between acquisitions made by foreign versus U.S. firms. The evidence sheds light on the motivations for foreign direct investment (FDI) in the U.S. as well as the factors influencing FDI via acquisitions.

We show that cross-border transactions are more concentrated in R&D intensive industries than are domestic takeovers. Furthermore, we find that three-fourths of cross-border takeovers occur between bidders and targets in related industries. The data thus support the view that FDI is more likely in situations in which a firm can take advantage of market imperfections or internalize what are otherwise costly (or inefficient) market transactions.

We demonstrate that target wealth gains are significantly higher in cross-border takeovers than in domestic acquisitions. This cross-border effect persists, having controlled for industry effects, variation in gains over time, the medium of exchange, and competition in bidding. Foreign companies pay around 10 percentage points (about 50 percent) more than domestic firms in noncash bids. This impact is as large as the increase in premiums resulting from all-cash deals or multiple bid takeovers, two effects receiving substantial attention in the finance literature.

In an attempt to understand the reasons for this cross-border effect on wealth gains we explored the role of industry characteristics, tax effects, exchange rate levels, and the bidder's experience. Like other studies of wealth effects we met with only partial success.

Tax variables do not provide a satisfactory explanation for variation in target wealth gains in cross-border and domestic takeovers. While tax variables are statistically linked to target gains, the direction of effect is often not consistent with the tax effects hypothesized by Scholes and Wolfson (1990). We conclude that these variables may be proxies for some other changes in the takeover market. We find that both domestic and foreign buyers pay higher premiums in R&D intensive industries; however, the R&D premium is not significantly larger for foreign than for domestic buyers.

On a more positive note, our results provide support for an important effect of currency fluctuations on foreign direct investment via acquisition. When a buyer's currency is strong relative to the dollar, target gains in cross-border acquisitions are higher. This is consistent with Froot and Stein's (1989) argument that exchange rate induced wealth changes to foreign buyers impart a bidding advantage when there are significant information asymmetries.

Cross-border takeovers are the largest component of FDI in the U.S. and an increasingly large component of total U.S. acquisitions. Therefore, understanding of cross-border takeovers requires a marriage of the theoretical and empirical work on FDI and corporate acquisitions. Our paper begins this integration. We confirm the existence of a cross-border premium and study a number of variables which might determine its magnitude. Still, we are unable to explain fully the higher wealth gains in cross-border takeovers

compared to domestic takeovers. The residual difference may be attributable to overly aggressive bidding by foreign buyers or to general advantages of expansion into the U.S. including market size, well-developed capital markets, political stability, or tariff and tax differences between the U.S. and bidder's home country. Testing for the impact of such factors must await research incorporating data from a number of different countries.

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