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Cross-Border Mergers and Acquisitions:  
A Capital Budgeting Approach and Empirical Evidence

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Cross-Border Mergers and Acquisitions:
A Capital Budgeting Approach and Empirical Evidence

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Wei-Li Lu provided capable research assistance for this project.
ABSTRACT

This paper presents a financial framework for the analysis of cross-border mergers and acquisitions. This framework is then used to explain the recent tendencies of increasing acquisitions of U.S. firms by foreign firms and reduced acquisitions of non-U.S. firms by U.S. firms. In particular, this study examines the empirical evidence on cross-border mergers and acquisitions between firms in the United States and the United Kingdom. The results suggest that exchange rates, price-earnings ratios in both countries, and the level of stock prices in the acquired company's country (in this case, the U.S.) contribute significantly for an explanation of the difference in foreign acquisitions (U.K.-U.S.) in the period 1979-1987.
1. Introduction

Since the 1981-1982 recession in the United States, there has been a marked increase in merger and acquisition activity. Firms are also expanding their evaluation of potential acquisition prospects across international borders. Although international mergers and acquisitions are not a new concept in a historical sense, as recently as 1985 only 12 percent of the 3,165 transactions valued at $1 million or more involved U.S. and foreign firms as either buyers or sellers.¹

Cross-border merger and acquisition activity seems to vary in tandem with the patterns of international trade and finance. During certain periods of the 1960s and the early part of 1970s, American firms were active acquirers overseas. Conversely, in recent years foreign acquisition of American firms has been increasing. Two well-known examples are Nestle’s acquisition of Carnation and the Royal Dutch/Shell buyout of Shell Oil. These two acquisitions were included in a list of the ten largest completed deals of all time as of February 1986, as shown in Table 1 below.²

This increased foreign acquisition of American firms has attracted the attention of the specialized press and analysts.³⁴ One common argument is that foreign firms look for the growth and stability offered by the U.S. markets. This argument sees foreign concerns acquiring American firms in order to establish a domestic production
base, given a perceived potential loss of the U.S. market due to protectionist measures. However, there seems to exist an upward trend in cross-border merger and acquisition activity, even if we exclude U.S. companies. Countries like Canada, Australia and the United Kingdom have witnessed an increasing number of such deals. One may speculate that national borders are becoming less of a deterrent when these acquisitions opportunities are contemplated.

Still, it seems that America, because of its huge economy and internal market, coupled with a non-interventionist government stance, is perceived as uniquely attractive to foreign companies. There are sharp differences in public opinion regarding these recent acquisition trends. One polar view sees foreigners buying up the American industrial base and forcing American companies to undertake anti-takeover measures which imply an excessive focus on short-term results. Others see foreign ownership of U.S. firms as a conduit to bring new ways of thinking, new approaches to management and new capital. This side of the public opinion sees the restructuring of some companies or industries as beneficial to the economy in the long run.

From these observations, it seems interesting to examine the variables that a company takes into consideration when contemplating a cross-border acquisition or merger. The literature lacks a framework within which different cases of cross-border merger acquisitions can be analyzed. The purpose of this study is to offer a financial framework for how the feasibility of proposed foreign acquisition can be measured. This framework is then used to explain the recent tendencies of increasing acquisitions of U.S. firms by foreign firms and
reduced acquisitions of non-U.S. firms by U.S. firms. In particular, we will examine the empirical evidence on cross-border mergers and acquisitions between firms in the U.S. and in the United Kingdom.

This paper will develop as follows. Section 2 explores different arguments offered in the literature to explain the phenomenon of cross-border mergers and acquisitions. Section 3 presents a capital budgeting approach to the study of this problem. This section attempts to present an integrated financial framework which leads to some empirically testable implications about the significance of certain variables for the foreign acquisition decision. Section 4 presents the empirical evidence on cross-border mergers and acquisitions between U.S. and United Kingdom firms in the period 1979-1987. Finally, Section 5 presents a summary and the conclusions of this study.

2. Rationale for Cross-Border Acquisitions and Mergers

A potentially large vector of factors has been periodically invoked in the literature as being responsible, at least in part, for the surge of cross-border mergers and acquisitions in recent years. The following list is by no means exhaustive. It does include, however, some well-known explanations, such as those related to exchange rates and protectionism, as well as less obvious ones.

2.1 Exchange Rates

According to much of the literature on international acquisitions and mergers, exchange rates play a major role in the decision-making process. The argument is that, say, if the dollar is strong with
respect to foreign currencies, we should see an upward trend in the acquisitions of foreign firms by U.S. firms and a downward trend in the acquisitions of American firms by foreign firms. The opposite should hold in periods were the dollar weakens against major foreign currencies. There exists some evidence in support of this view. For example, throughout the early to mid-1970s, U.S. firms were active in cross-border acquisitions. During this period, the dollar appreciated considerably against the SDR. In the later part of the 1970s, the dollar registered mixed results against the SDR and the U.S. firm's enthusiasm began to taper off. Then, in the late 70s and early 80s, the dollar rebounded against the SDR and U.S. firms once again became active overseas (see Graph 1).

However, there is an opposite argument with respect to the importance of the value of the dollar at the time of the acquisition. Those who spouse this opposite view concede that in the case of a strong dollar, American firms would be able to pay out a smaller dollar amount to complete a deal, but argue that the future profits to be remitted from the prospective subsidiary will have a lower discounted value as measured in dollars. Thus, they argue, the direction of the exchange rate effect is not as clear-cut as the previous view implies (note some apparent inconsistencies in Graph 1).

The relative importance of these two views is ultimately an empirical question, which will be addressed in Section 4 of this study for the U.S. - U.K. case. Exchange rates, however, are by no means
the only factor affecting the trends in cross-border acquisitions and mergers. Another oft-mentioned factor is appropriate diversification.

2.2 Diversification

According to this view, whatever the firm's preferred risk-return position, international diversification by the way of acquisitions or mergers improves the tradeoff. This is so because the covariance of returns across economies, even for the same industry, is likely to be smaller than within a single economy.

This view suggests that securities price data or price/earnings ratios should be used to evaluate the opportunities of cross-border mergers and acquisitions. This argument is operationalized as follows. The prospective acquiring company must decide on its desired levels of risk and return. Then it should attempt to identify countries, industries, and specific firms which fall within this "risk class." Finally, the company should decide whether the proposed merger or acquisition not only meets the specific desired risk/return criteria, but also opens up the opportunity for increased return and/or reduces fluctuations of earnings. These guidelines may be modified in light of the less quantifiable but no less important factors which follow.

2.3 Current Economic Conditions in the Home Country

Home-country economic conditions, such as a slump or recession, may cause firms to concentrate on their domestic business while temporarily holding off on strategic international moves. For example, in the period from the latter part of 1981 until 1984, potential
European acquirers of U.S. firms had to contend with a soaring dollar and with sluggish economies at home. The unemployment rate in that period was 14 percent in the U.K. and 10 percent in West Germany. Not surprisingly, there was not much activity in the acquisition of U.S. firms by European firms in that period.

2.4 Planned Reduction of Competition

The typical scenario outlined in this argument sees a company which has already established a subsidiary in a foreign country. However, competition from domestic firms or subsidiaries of other multinationals is fierce. The parent company, in an effort to widen the market share for its subsidiary, considers the acquisition of a competing firm. This strategy, of course, raises questions related to antitrust considerations, which will be discussed below.

2.5 Acquisition of Modern Technology

There are cases in which the firm falls behind the level of technological knowledge necessary to compete efficiently in the industry in the domestic and/or international market. The firm is unable or unwilling to develop the required technology through research and development. Therefore, this firm may look for potential acquisitions of similar firms in other countries which are technologically more advanced. By acquiring or merging with such foreign firm, the resulting firm will have a foothold in the foreign country's market, and may as well transfer the acquired technological advantages back home in order to strengthen its position in the domestic market.
So far, we have discussed factors which tend to encourage firms to look for prospective cross-border acquisitions or mergers, with the exception of conditions in the domestic economy which may hinder an otherwise favorable climate for such deals. In contrast, the following variables, namely, information, culture, business practices, and antitrust considerations, by and large work to restrain the cross-border merger movement. They are discussed briefly next.

2.6 Availability of Information

The acquisition of information, particularly financial information, about a prospective target is a crucial step in the decision-making process of the acquiring firm. For example, areas in which timely and accurate information is necessary include current market share figures, competition comparisons, current sales, forecasted cash flows, and company-specific strengths and weaknesses, to name a few. It is not uncommon that the policy of the foreign firm is not to disclose these and other relevant figures. If necessary or even crucial information is not available to make an accurate analysis of the target, the prospective acquiring firm may be forced to delay or even drop its plans, even though the foreign firm appears to be a very attractive target on the surface. Otherwise, the failure to come up with an accurate analysis may prove to be devastating for the acquiring firm.

2.7 Culture

If frictions and misunderstanding are to be avoided abroad, foreign customs must be understood and respected. Granted, it seems
that most businesses in market economies have basically the same motivations, and doing business at the executive level actually differs little among countries. Problems may arise, however, when existing differences are not recognized. For example, foreign executives may expect to become familiar with their prospective business partners before engaging in substantial merger discussions. Thus, to assure full cooperation of the foreign nationals, it may be necessary that the acquiring firm's management take the time to develop comprehensive, personal relationships with their foreign counterparts. This approach is in contrast with the stereotypical American style of negotiation but may well prove decisive for the success of the prospective merger or acquisition.7

2.8 Customary Business Practices

By the same token, it is important to remember that strong similarities between foreign practices and those of the domestic company concerning financing, marketing, corporate organization and accounting, do not always exist. In addition, and especially relevant for prospective mergers and acquisitions, stockholder's rights and privileges differ from country to country. One example has to do with operating and control procedures. Once the acquisition or merger process is concluded, the parent company may well require that the acquired company makes some changes in accounting procedures in order to unify the operations of the two organizations. Since these procedures are usually related to evaluation criteria of management, it is likely that there will be resistance to such changes.
2.9 Governmental Restrictions and Antitrust Considerations

Finally, the issue of obstacles of legal and/or regulatory form deserves consideration. Most governments have some form of takeover regulation in place. In many instances, government approval is mandatory before acquisitions by foreign businesses may be made. In addition, government restrictions may exist on capital repatriations, divided payouts, intracompany interest payments, and other remittances. These restrictions seem to be more prevalent in less developed countries.

Moreover, international transactions may raise antitrust issues. Mergers with foreign firms certainly belong to this list, but also do distributorship contracts, patent and trademark licences, overseas distribution arrangements, raw material procurement agreements and concessions, and overseas joint ventures for manufacturing, research, and distribution. Antitrust considerations, then, will probably have some bearing on a firm's decision to merge internationally, to the extent that uncertainty about these areas may cause companies to unnecessarily limit their participation in them.

It is difficult to assess the relative importance of the variables discussed in this section on the foreign acquisition decision, since many of them do not lend themselves to quantification and testing. One way to address this difficulty is to focus on a narrow range of financial variables logically integrated in a financial framework leading to some testable propositions about the importance of these variables on the foreign acquisition decision. One such framework,
based on a capital budgeting approach, is discussed in the next section.

3. A Capital Budgeting Approach

This section presents a financial framework for the evaluation of proposed foreign acquisitions. This framework is used in the following section to investigate the recent trends of cross-border mergers and acquisitions between U.S. and U.K. firms.

3.1 Generalized NPV Analysis of Cross-Border Mergers and Acquisitions

We start from the proposition that the feasibility of a foreign acquisition can be evaluated like any other project, with due attention to its peculiar characteristics. These specific characteristics which influence a foreign acquisition may differ substantially from those that influence other projects. These facts notwithstanding, a capital budgeting analysis can be applied to determine whether the net present value (NPV) of the acquisition is positive. Consider the following capital budgeting framework, as applied to a foreign acquisition:

$$
NPV_{FA} = -I_{FA} + \sum_{t=1}^{n} \frac{CF_{FA,t}}{(1+k_{FA})^t} + \frac{SV_{FA,n}}{(1+k_{FA})^n}
$$

(1)

where

- $NPV_{FA}$ = net present value of a foreign acquisition;
- $I_{FA}$ = initial outlay of a foreign acquisition;
- $k_{FA}$ = discount rate;
- $CF$ = cash flows to the acquirer; and
- $SV$ = salvage value to the acquirer.
As with any project, the variables above should incorporate any tax implications so that the net present value reflects after-tax cash flows. In addition, all cash flows should be measured from the acquirer's perspective and in the acquirer's home currency.

3.2 Detailed NPV Analysis of Cross-Border Mergers and Acquisitions

The factors that influence a firm's attraction to a prospective foreign acquirer can be identified by breaking the general NPV equation into its components. The following discussion identifies the specific factors which affect a foreign acquisition's initial outlay, periodic cash flows, and salvage value.

a. Initial Outlay. The initial outlay \( I_{FA} \) can be broken down into three components, as shown below:

\[
I_{FA} = E_h + D_h + D_f (ER_f)
\]  

(2)

where

\( E_h \) = equity funds in the home currency;
\( D_h \) = borrowed funds in the home currency;
\( D_f \) = borrowed funds in the foreign currency; and

\( ER_f \) = exchange rate of foreign currency at the time the foreign funds were borrowed.

In order to measure the entire initial outlay in terms of the home currency, any borrowed funds in foreign currency must be translated into the home currency. Moreover, some firms may cover the entire initial outlay from any one of the above components. The manner by which funds are obtained to cover the initial outlay may affect the required return on the acquisition.
b. **Periodic Cash Flows.** The relevant cash flows in the analysis of cross-border mergers and acquisitions are those flows received by the acquiring firm. They are determined by (1) the after-tax foreign cash flows generated, (2) the percentage of those after-tax cash flows to be remitted to the acquirer, and (3) the exchange rates at the time that the after-tax foreign cash flows are remitted. Then, the after-tax cash flows received by the acquiring firm can be described as:

\[
CF_{FA,t} = (CF_{fa,t})(1-R_{f,t})(ER_{f,t})
\]  

where

- \(CF_{fa,t}\) = foreign cash flows generated during period \(t\);
- \(R_{f,t}\) = cash flows retained by the (then) foreign subsidiary to support future operations; and
- \(ER_{f,t}\) = exchange rate of foreign currency at the time of the remittance.

c. **Salvage Value.** The salvage value from the acquirer's perspective as of time \(n\) (\(SV_{FA,n}\)) is determined by the anticipated foreign market value of the acquired business at time \(n\) (\(MV_{f,n}\)) and the prevailing exchange rate at the time of the planned sale, as described below:

\[
SV_{FA,n} = (MV_{f,n})(ER_{f,n}).
\]  

Note that the foreign market value may represent a liquidation value or a going concern value, whichever is likely to be higher.

If we now integrate the detailed expressions for the initial outlay, periodic cash flows, and salvage value, an alternative
expression for the NPV analysis of a foreign acquisition can be described as follows:

\[
NPV_{FA} = -I_{FA} + \sum_{t=1}^{n} \frac{CF_{FA,t}}{(1+k_{FA})^t} + \frac{SV_{FA,n}}{(1+k_{FA})^n} = -[E_h + D_h + D_f (ER_f)] \\
+ \sum_{t=1}^{n} \frac{[(CF_{f,t})(1-R_{f,t})(ER_{f,t})]}{(1+k_{FA})^t} + \frac{[(MV_{f,n})(ER_{f,n})]}{(1+k_{FA})^n}.
\]  

(5)

When expressed as in Equation (5), the capital budgeting approach provides a valuable framework for explaining the influence of several factors on the feasibility of foreign acquisitions. These factors are discussed in more detail below.

3.3 Factors Affecting the Feasibility of Cross-Border Mergers and Acquisitions

We will examine several factors which seem to affect the initial outlay, the periodic cash flows, and the salvage value. In addition, we will devote some attention to factors affecting the required rate of return or discount rate.

a. Initial Outlay-Related Factors. Any factors that can reduce the initial outlay will make a foreign acquisition more attractive. If the acquiring firm covers a portion of its initial outlay by borrowing foreign funds, the existing exchange rate at the time of the planned acquisition is important. The lower the home currency value of the foreign currency, and the more funds borrowed in the foreign currency, the lower will be the initial outlay from the acquirer's perspective.
In addition, if the business to be acquired is partly owned by the foreign government, or is likely to fail, that government may encourage an acquisition with some form of discount or tax rebate. This would be reflected in the actual estimate of the initial outlay.

b. Periodic Cash Flow-Related Factors. The feasibility of a foreign acquisition is highly influenced by the cash flow estimates from the acquirer's perspective ($CF_{FA}$). These cash flows are dependent on several factors. First, any factors that influence the foreign cash flows could influence the amount of cash flows remitted to the acquirer. Among the factors affecting the foreign cash flow, we find variables such as the foreign country's rate of economic growth and the cost of consumer credit. Then, any factors which improve foreign cash flows will in principle improve $CF_{FA}$ and vice-versa.

Moreover, the percentage of the cash flows retained by the foreign business will also affect $CF_{FA}$. In particular, a strategy of retaining more funds abroad lowers the $CF_{FA}$ over the short run but allows for more growth in the foreign business. It follows that the $CF_{FA}$ may be higher in the future if this growth creates sufficiently more foreign cash flows ($CF_{f}$) to offset the higher cash flows retention percentage ($R_f$). As a result, the market value of the foreign business could increase. In addition, some foreign governments may require that a specific minimum proportion of cash flows be retained by the foreign business. This forces a lower limit on $R_f$ and could affect the $CF_{FA}$. 
Finally, the prevailing exchange rates at the times cash flows are remitted can affect $C_{FA}$. The higher the appreciation of the foreign currency with respect to the domestic currency, the higher will be the $C_{FA}$. Recall also that, as stated above, any tax implications should be considered because the NPV of the foreign acquisition should reflect after-tax cash flows. 9

c. **Salvage Value-Related Factors.** The salvage value to the acquirer can be affected by any factors which influence the market value of the foreign concern ($MV_{f,n}$) at the end of the investment horizon. If the host government is a likely candidate to purchase the business, then that government's relations with the acquirer may be important.

In those countries where most businesses are privately owned, the market value of a business will be highly influenced by market conditions as a result of future economic conditions. In general, the market value of any business at time $n$ is determined by the anticipated cash flows to be generated from that point on. Moreover, from the foreign acquirer's perspective, the salvage value is affected not only by future market value, but also by the exchange rate at which the proceeds from the sale of the foreign business can be converted to the home currency, i.e., the higher is the anticipated value of the foreign currency at that time, the higher is the estimated salvage value.

d. **Required Return-Related Factors.** The required return on a foreign business is dependent on the cost of financing the business, which in turn, is influenced by (1) the risk-free interest rate and
(2) the business risk. The lower the risk-free rate and the lower the perceived risk of a business, the higher the market value assigned to a business, other things equal. When assessing a foreign business, however, two risk-free rates are important. First, the home risk-free rate influences the home cost of equity funds and borrowed funds. Second, the foreign risk-free rate influences the cost of borrowing foreign funds.

The perceived risk of acquiring a foreign business emanates from the uncertain components that affect its value to the acquirer. These components include periodic cash flows \((CF_{f,t})\), the foreign exchange rate \((ER_{f,t})\) at several points in time, the future market value of the business \((MV_{f,n})\), and the exchange rate at the time the foreign business is to be sold \((ER_{f,n})\).

To summarize, this capital budgeting approach allows us to obtain insights relating to the multiplicity of factors which impact on the decision to acquire a foreign firm. We now turn to the case of cross-border acquisitions involving U.S. firms.

3.4 Relevant Variables in Recent Foreign Acquisition Activities Involving U.S. Firms

Because firms vary by industry, risk, size, and international expertise, their interest in foreign acquisitions varies. However, our previous discussion implies that some macro variables may be used to explain general foreign acquisitions tendencies involving firms of a particular country, whereas other industry- or firm-specific variables complete the picture and help to explain whether cross-border mergers and acquisitions happen more in certain industries, as
well as whether they tend to be related with some company-specific factors (e.g., size).

In the case of cross-border mergers and acquisitions involving U.S. firms, several relevant variables can be identified. The initial outlay necessary for non-U.S. firms to acquire a U.S. business has been relatively lower in recent years thanks to a downward trend of the foreign exchange value of the dollar since 1985. In addition, while U.S. stock prices have generally increased in recent years, at least until the crash of October 1987, U.S. businesses have still been perceived as bargains by non-U.S. firms that can obtain dollars cheaply.

Moreover, the estimated periodic cash flows of a U.S. business from a non-U.S. firm's perspective have been generally high for the following reasons. First, the economic conditions in the U.S. have been generally favorable since 1982 and suggest strong dollar cash flows. Second, the dollar is unlikely to weaken much further and it will convert into a greater amount of home currency cash flows to non-U.S. firms once the dollar strengthens. The salvage value of a U.S. business is also favorably affected by optimistic economic conditions in the U.S. and a stronger dollar in the future.

The cost of capital for most foreign firms has been very low in recent years. This can be attributed to (1) a low home risk-free rate, which reduces their home cost of equity funds and borrowed funds, and (2) a low U.S. risk-free rate which reduces their cost of borrowing U.S. funds.
Conversely, while the cost of capital has also been relatively low for U.S firms in recent years, their foreign acquisition activity is low. This is mainly due to the existing and anticipated value of the dollar. The dollar's weakness raises the initial outlay for U.S. firms acquiring non-U.S. firms. In addition, a possible strengthened dollar in the future will reduce the conversion value of foreign cash flows generated. Finally, the estimated salvage value of a non-U.S. firm could be substantially reduced in the dollar strengthens.

Having developed this approach to the investigation of foreign acquisitions, we now turn to an empirical analysis of the cross-border mergers and acquisitions involving U.S. and U.K. firms during this decade. This is presented in the next section.

4. The Empirical Evidence: Foreign Acquisitions Involving U.S. and U.K. Firms

In this section, we introduce a statistical model which operationalizes the relevant variables identified by the capital budgeting approach to foreign acquisitions. This model is estimated for the case of foreign acquisitions involving U.S. and U.K. firms in the period 1979-1987.

4.1 The Model

The following economic model was specified:

\[ ACQ_t = f(EXRATE_t, PEUK_t, PEUS_{t'}, BYDIF_t, STKUK_{t+1}, STKUS_{t+1}) + e_t \]  (6)
where:

\[ ACQ(UK-US) = \text{difference between the number of British acquisitions of American firms and the number of American acquisitions of British firms;} \]

\[ EXRATE = \text{the exchange rate measured as } \$/£; \]

\[ PEUK = \text{price-earnings ratio in the U.K.;} \]

\[ PEUS = \text{price-earnings ratio in the U.S.;} \]

\[ BYDIF(UK-US) = \text{bond yield differential between comparable debt securities in the U.K. and U.S.;} \]

\[ STKUK = \text{stock market index in the U.K.;} \]

\[ STKUS = \text{stock market index in the U.S.} \]

The corresponding statistical model was hypothesized as a linear model as follows:

\[
ACQ_t = \beta_0 + \beta_1 EXRATE_t + \beta_2 PEUK_t + \beta_3 PEUS_t + \beta_4 BYDIF_t \\
+ \beta_5 STKUK_t + \beta_6 STKUS_t + \varepsilon_t \tag{7}
\]

and the error process was assumed to be \( e \sim N(0, \sigma^2 I_T) \). In line with these assumptions, the proposed empirical relationship was estimated by ordinary least squares (OLS). A more detailed description of the data is shown below.

4.2 The Data

All variables are measured on a quarterly basis, from the first quarter of 1979 through the second quarter of 1987. This period of analysis encompasses both a subperiod when the U.S. dollar appreciated against the British pound (1979-85) and the subsequent period of depreciation of the U.S. dollar. With the exception of the dependent
variable, i.e., the difference (U.K.-U.S.) in acquisitions for a given quarter, all other variables are quarterly averages. Data for all the independent variables were collected monthly using the last observation available for a given month and then the quarterly average was calculated.

Data for exchange rates (EXRATE), measured in U.S. dollars per pound sterling, were taken from the IMF's *International Financial Statistics*. The price-earning indices for both the U.S. (industrial P/E ratio) and the U.K. (P/E ratio, net) were obtained from the *Financial Times*. The figures for the bond yields come from Morgan Guaranty's *World Financial Markets*, "Domestic Corporate Bond Yields" (long-term issues). Finally, the stock indices are, from the U.S., the S&P500 composite (close), from the *Daily Stock Price Record*, and, for the U.K., the FT-500 Actuaries Share Index, from the *Financial Times*. The results of our empirical analysis are presented next.

4.3 Empirical Results

Table 2 presents some descriptive statistics: the mean, standard deviation, and minimum and maximum values for the dependent and independent variables. Recall that the difference in foreign acquisitions (ACQ) is measured as the number of British acquisitions of American firms minus the number of American acquisitions of British firms. Thus, a positive integer value for ACQ means that the number of British acquisitions exceeded the number of American acquisitions in a particular quarter. The mean value (6.9) and the standard deviation (7.8) for the ACQ variable show that the period 1979-87 was one in
which British acquisitions prevailed. The average exchange rate for the period was $1.723/£, and for comparable corporate debt securities, U.K. annualized yields exceeded U.S. yields by 0.78 percent (78 basis points) on average during the period 1979-87. The remainder of this table lends itself to similar interpretations.

In Table 3 a correlation matrix is presented. The numbers under the values of the correlations, in parentheses, are the probabilities of obtaining a correlation coefficient (positive or negative) of this order of magnitude or larger given the null hypothesis of zero correlation. In other words, large values for these probabilities suggest that the corresponding correlation coefficient likely occurred by chance. Let us focus on the correlation between the independent variables and the dependent variable (ACQ). The correlation coefficient between the exchange rate and ACQ is nearly zero and the prob value is nearly one, suggesting that exchange rates may influence foreign acquisitions either way. This is consistent with our previous discussion (see Sections 2.1 and 3). Low correlation values and high prob values also appear for BYDIF and STKUK. In the case of bond yield differentials, our framework suggests that the particular financing package for the foreign acquisitions may include debt contracted in the home country or in the foreign (target) country. This low correlation seems to suggest that the acquiring firms can tap either market in the U.S. - U.K. case. Finally, the low correlation between STKUK and ACQ (UK-US) suggests that the acquirers (mainly British firms) were more
sensitive to stock prices in the foreign country (i.e., the U.S.) than to stock prices in the home country. This makes sense, because the higher the shares prices in the U.S., the more difficult for British firms to acquire American companies, other things equal.

(Insert Table 3 Here)

The main results of this empirical study are presented in Table 4. This table shows the parameter estimates of our linear model, as well as tests of significance for these estimates, and goodness-of-fit tests for the model. In addition, the results of a test for autocorrelation are also presented. These tests reject the hypothesis of the existence of first order autocorrelation and show that the proposed model explains well the variability of this particular sample. Additional evidence of the predictive powers of this model will be presented below. Let us now focus on the parameter estimates, their signs and significance, as well as on the interpretation of the results.

The empirical results suggest that, in the case of cross-border acquisitions involving U.S. and U.K. firms, the exchange rate effect was more prevalent in the initial outflow than in subsequent cash inflows. This is so because, according to the results, a 1 percent increase in the $/£ ratio (i.e., a depreciation of the dollar) induced a 17 percent increase in the difference in acquisitions (ACQ=UK-US). Other variables with good explanatory power are the price/earnings ratios in both the U.K. and the U.S. and the level of stock prices in the country of the acquired firms (in this case, the U.S.). Notice
that, as expected, the price-earnings ratio in the U.S. (PEUS) has a negative effect on the dependent variable (ACQ=UK-US). One cannot reject the null hypothesis for the coefficients of the variables BYDIF and STKUK at the 5 percent level of significance. This result conforms to our discussion above.

(Insert Table 4 Here)

Finally, in Table 5 some results concerning the predictive power of the model are presented. The table shows actual and predicted values for the dependent variable (ACQ=UK-US), the residual difference between actual and predicted values for ACQ, standard errors of the predicted values and the residuals, and the t-value for residuals. These t-values, in particular, are used to identify observations which deviate greatly from the predicted value. The results suggest that in only one case, i.e., observation #32 (1986IV), the t-value exceeds 2.0 and is significant at the 5 percent level. This suggests that the proposed model fits well the data for the U.K. - U.S. case.

(Insert Table 5 Here)

In the next and final section, a brief summary and the conclusions of this study are presented.

5. Summary and Conclusions

This paper has developed a framework for analyzing foreign acquisitions. The framework was used to explain why, in recent years, non-U.S. firms have increased their acquisitions of U.S. firms while U.S. firms have decreased their acquisitions of foreign firms.
According to this capital budgeting approach, non-U.S. firms would find U.S. firms less attractive if (1) economic conditions in the U.S. became less favorable, (2) the risk-free rate in foreign countries increases, (3) the risk-free rate in the U.S. increases, or (4) projections suggest that the dollar will weaken in the future. Conversely, U.S. firms would most likely increase their acquisitions in foreign countries when (1) economic growth projections for foreign countries become more optimistic, (2) the dollar is expected to weaken over the long run, and (3) risk-free rates in foreign countries and in the U.S. remain low enough to sustain a relatively low required rate of return on foreign acquisitions.

An empirical examination of the cross-border mergers and acquisitions involving firms in the U.S. and the U.K. was performed. A linear statistical model was specified in which the explanatory variables are directly derived from the capital budgeting approach. This model proved successful in explaining the data. The variables which seemed to affect the difference in acquisitions in favor of U.K. companies during the period 1979-1987 were the exchange rate, price-earnings ratios in both countries, and the stock prices in the country of the acquired company (in this case, the U.S.). Notice that price-earnings ratios can be thought of as real rates of return. An analysis of the residuals showed that in only one instance the value of the residual, i.e., the difference between the actual and the predicted value for the difference in foreign acquisitions (U.K.-U.S.), was significant at the 5 percent level. This confirms the good predictive powers of the specified linear model.
In the final analysis, the anticipated long run outlook on the dollar is the critical factor for foreign acquisition activity of or by U.S. firms. Given the marked depreciation of the dollar vis a vis other major currencies since 1985, it is unlikely that firms will anticipate further substantial long-term weakening. Thus, the high foreign acquisition activity by non-U.S. firms and the foreign acquisition inactivity by U.S. firms is likely to continue for some time.
NOTES


4 Wayne (1987) reports that, as of November of 1987, foreigners have bought 266 American corporations for a total price of $36.7 billion, compared with 329 foreign acquisitions of U.S. firms for all of 1986 with a total value of $23.3 billion. See Wayne (1987), p. 29.


7 One researcher reported that, in the studies of American and Japanese firms looking for acquisition of or joint ventures with Indian firms, the following pattern was a common one. The American negotiating team would fly to India, book their hotel reservations for one week, and expected that talks would be substantially completed within that time frame. The Japanese teams, in contrast, would say nothing about their expected length of time for the negotiations, instead making a point of staying for as long as it was necessary. Not surprisingly, the Indian executives tended to have a clear preference for the Japanese approach. Reported by Prof. Arvind Phatak of Temple University in a seminar given at Florida Atlantic University in January of 1987.

8 See Hall (1986), p. 39, for a discussion of these issues.

9 We have avoided the discussion of tax issues because, while relevant, they are outside the scope of this paper. It is clear, for example, that tax considerations will play an important role in decisions regarding the retention rate of future cash flows generated by the foreign business.
REFERENCES


Graph 1

Shaded areas represent periods of more active U.S. acquisition of foreign companies.

NOTE: Average $/SDR rates to the nearest thousandth.

SOURCE: Based on monthly data from the International Financial Statistics Yearbook.

The actual $/SDR rates are as follows:

1971 - 1.007  1977 - 1.169
1972 - 1.088  1978 - 1.258
1973 - 1.196  1979 - 1.294
1974 - 1.203  1980 - 1.298
1975 - 1.212  1981 - 1.176
1976 - 1.178  1982 - 1.102
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<th>Acquirer</th>
<th>Target</th>
<th>Value ($ mil.)</th>
<th>Date</th>
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</thead>
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<td>Gulf Corp.</td>
<td>13,300.0</td>
<td>6/84</td>
</tr>
<tr>
<td>Texaco Inc.</td>
<td>Getty Oil</td>
<td>10,125.0</td>
<td>2/84</td>
</tr>
<tr>
<td>DuPont</td>
<td>Conoco</td>
<td>6,924.0</td>
<td>8/81</td>
</tr>
<tr>
<td>U.S. Steel</td>
<td>Marathon Oil</td>
<td>6,150.0</td>
<td>3/82</td>
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<tr>
<td>Mobil Corp.</td>
<td>Superior Oil</td>
<td>5,700.0</td>
<td>9/84</td>
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<tr>
<td>Royal Dutch/Shell Group</td>
<td>(remaining 30.5%)</td>
<td>5,670.0</td>
<td>6/85</td>
</tr>
<tr>
<td>R.J. Reynolds</td>
<td>Nabisco Brands</td>
<td>4,904.5</td>
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<td>Allied Corp.</td>
<td>Signal Cos.</td>
<td>4,850.8</td>
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<tr>
<td>Nestle SA</td>
<td>Carnation Co.</td>
<td>2,893.6</td>
<td>1/85</td>
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*As of February 1986

SOURCE: Mergers and Acquisitions, January/February 1986
Table 2

Descriptive Statistics

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<th>MAXIMUM</th>
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NOTE: Number of observations n = 34
Table 3
Pearson Correlation Coefficients

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<td></td>
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<td>(.000)</td>
<td>(.000)</td>
<td>(.553)</td>
<td>(.004)</td>
<td>(.000)</td>
<td>(.000)</td>
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</table>

*Prob > |ρ| under H₀: ρ = 0. The same applies for all the figures in parentheses.
Table 4

Parameter Estimates, Tests of Significance
and Tests for Autocorrelation

Model: \( ACQ_t = \beta_0 + \beta_1 \text{EXRATE}_t + \beta_2 \text{PEUK}_t + \beta_3 \text{PEUS}_t + \beta_4 \text{BYDIF}_t + \beta_5 \text{STKUK}_t + \beta_6 \text{STKUS}_t + e_t \)

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<tr>
<th>VARIABLE</th>
<th>INTERCEPT</th>
<th>EXRATE</th>
<th>PEUK</th>
<th>PEUS</th>
<th>BYDIF</th>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(</td>
<td>t</td>
<td>-value)(^{(1)})</td>
<td>(3.79)</td>
<td>(2.92)</td>
<td>(4.15)</td>
<td>(2.67)</td>
<td>(1.68)</td>
</tr>
<tr>
<td>Prob &gt;</td>
<td>t</td>
<td>(^{(2)})</td>
<td>.001</td>
<td>.007</td>
<td>.000</td>
<td>.013</td>
<td>.104</td>
</tr>
<tr>
<td>(R^2) { Unadjusted</td>
<td>0.503(^{(3)})</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Adjusted</td>
<td>0.392(^{(3)})</td>
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</table>

F Value = 4.549  Prob > F = .003\(^{(4)}\)

Durkin-Watson Statistic (for n=34) = 1.935

1st Order Autocorrelation = .015\(^{(5)}\)

NOTES:

(1) |t| for \(H_0: \beta_1 = 0;\)

(2) Probability of obtaining the deserved |t|-value or one larger in absolute value in a T distribution with the appropriate DF's (two-tailed test);

(3) \(R^2\) adjusted for degrees of freedom; \(\text{Adj}R^2 = R^2 - \frac{m}{n-m-1} (1-R^2)\) where \(m = 6\) (# of DF's) and \(n = 34\) (# of observations);

(4) Probability that an F distribution will take on values greater than the observed F-value;

(5) Estimate of the 1st order autocorrelation between residuals lagged one period.
## Table 5

### Prediction and the Model

Dependent Variable: ACQ = UK-US

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<tr>
<th>OBS #</th>
<th>QUARTER</th>
<th>ACTUAL VALUE</th>
<th>PREDICTED VALUE</th>
<th>STD ERR PREDICT(1)</th>
<th>RESIDUAL (2)</th>
<th>STD ERR RESIDUAL(3)</th>
<th>STUDENT t RESIDUAL(4)</th>
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<td>2</td>
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<td>3</td>
<td>III</td>
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<td>4.43</td>
<td>1.30</td>
</tr>
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</table>

**NOTES:** (1) Standard error of the predicted value; (2) actual-predicted value; (3) standard error for each residual value; (4) t-value for residuals; used to identify observations which do not fit the model.