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**Determinants of higher target wealth gains in foreign takeovers  
of U.S. companies**

**Jung, Hyung-Chan, Ph.D.**  
City University of New York, 1992

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**DETERMINANTS OF HIGHER TARGET WEALTH  
GAINS IN FOREIGN TAKEOVERS  
OF U.S. COMPANIES**

by

**HYUNG-CHAN JUNG**

A dissertation submitted to the Graduate Faculty in  
Business in partial fulfillment of the requirements for  
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of New York.

1992

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## **Abstract**

# **DETERMINANTS OF HIGHER TARGET WEALTH GAINS IN FOREIGN TAKEOVERS OF U.S. COMPANIES**

by

**Hyung-Chan Jung**

Advisor: Professor Stavros Thomadakis

This paper develops a simple model to explain the reasons why foreign acquirers pay significantly higher premiums for U.S. target firms than do U.S. buyers. We also provide empirical work on the valuation effect of foreign takeovers and the determinants of the wealth gains of U.S. target shareholders involved in foreign takeovers. Thus this study provides a foundation for understanding the wealth effect of foreign takeovers.

The sample analyzed in this study consists of 104 targets acquired by foreign firms and 104 targets acquired by domestic firms. The results indicate that target wealth gains are significantly higher in foreign takeovers than in domestic takeovers, after controlling for the well-known wealth effects of payment method, acquisition type, tax status, size and time period of bids. This confirms the valuation effect of foreign takeovers. Furthermore, the results of cross-sectional regression analysis show that the variation in U.S. target wealth gains is explained by extra tax benefits stemming from double tax deductions for acquisition-related interest expenses incurred by foreign acquirers. These findings imply that differential taxation across tax jurisdictions is the main source of the valuation effect of foreign takeovers.

In addition, we find that there exists a valuation effect of the nationality of the foreign acquirers. Japanese companies pay significantly higher premiums than do non-Japanese acquirers. The finding also indicates that competition among bidders increases the abnormal returns to U.S. target shareholders in foreign takeovers. On the other hand, neither the deviation of exchange rates from PPP nor the industry characteristics of foreign acquirers and U.S. target firms are positively related to the magnitude of U.S. target abnormal returns. It is also observed that real interest differentials between the U.S. and the home countries of foreign acquirers cannot explain the disparity in the wealth gains of U.S. target shareholders involved in foreign takeovers.

This study does not take into account the effects of foreign takeovers on the stock prices of foreign acquirers and thus does not fully address the valuation effect of cross-border takeovers.

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## **Chapter 1**

### **Introduction**

Foreign direct investment (FDI) in the United States has grown rapidly in recent years and the United States now hosts more foreign direct investments than any other country. In recent years the United States has received more than one third of world direct investment capital flows. Because of the size and importance of the U.S. market, entry into the United States takes on particular significance for foreign enterprises. Furthermore, realization that European companies must be large to compete effectively with multinational enterprises (MNEs) in the U.S. and Japan leads to an increase in the propensity to acquire competitors at home and abroad, especially in the United States.

By far, the most common mode of FDI transactions has been mergers and acquisitions (M&A). The growth of foreign M&A over the past 10 years has been dramatic. The value of foreign acquisitions of the U.S. companies in 1989 was \$40.0 billion, while it was only \$7.1 billion in 1980.

Table 1-1 shows publicly announced M&A activities in the U.S. for the period 1980-89. These M&A activities include transactions between U.S. companies, and cross-border transactions in which U.S. companies acted as buyers or sellers with non-U.S. counterparts.

During this period, approximately 25,362 transactions involving mergers and acquisitions, divestitures, and leveraged buy-outs (LBOs) with a market value of \$1,649 billion were announced. Of these transactions, nearly \$1,360.6 billion (82%) occurred between U.S. companies. On the other hand, cross-border transactions accounted for 18 percent, or \$288.4 billion, of all M&A transactions involving U.S. corporations.

Of these cross-border transactions, \$223.5 billion (77%) were foreign acquisitions in which non-U.S. companies acquired U.S. companies, while \$65.1 billion

(23%) were U.S. acquisitions of foreign companies. That is, the value of foreign acquisitions were approximately 3.5 times larger than U.S. buyer transactions. These statistics clearly indicate that foreign acquisitions of U.S. companies dominated U.S. acquisitions of non-U.S. companies during the 1980s. Furthermore, 22 out of the 100 largest mergers in U.S. history involved foreign companies, all taking place since 1980.

However, academic research on foreign direct investment in the U.S. of non-U.S.-based firms is relatively limited, especially, on foreign takeovers of U.S. companies, even though there are a lot of published studies which are concerned with the motivations or determinants of FDI activities of U.S.-based firms and their impact on the wealth of U.S. parent firms' shareholders [Agmon and Lessard (1970), Errunza and Senbet (1981), Dunning and Rugman (1985), Doukas and Travlos (1988)].

Furthermore, in comparison with numerous studies about the effects of domestic takeovers on the stock price of target firms [Dodd and Ruback (1977), Jensen and Ruback (1983), Halpern (1983), Jarrell, Brickley and Netter (1988)], the wealth effects of foreign takeovers on U.S. target firms have not been studied as extensively.

Nevertheless, one of the most interesting findings in foreign acquisition literature is that foreign acquiring firms pay significantly higher premiums to the U.S. target shareholders than do U.S. buyers.

Weston, Chung, and Hoag (1990) have shown that from 1977 to 1988, the average premium paid in foreign acquisitions was 47.4%, while the average premium paid in all U.S. acquisitions (domestic and foreign) was about 42.8%.<sup>1</sup> They suggested a number of potential explanations for the higher premiums as follows:

- (1) Lack of familiarity may lead to errors in setting an appropriate price.
- (2) Foreign acquisitions will be carried out on a cash basis rather than via an exchange of securities, since most U.S. stockholders are unwilling to accept the securities of any but the most well-known foreign companies.
- (3) Foreign managements often feel strongly that the takeover should not be hostile to avoid ill-will after the takeover. The requirement that the

takeover be friendly may lead to higher premiums.

Harris and Ravenscraft (1991) study shareholder wealth gains for 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 indicates that target wealth gains are significantly higher in cross-border takeovers (39.77%) than in domestic takeovers (26.33%).<sup>2</sup> Furthermore, in an attempt to understand the reasons for this cross-border effect on wealth gains, they explored the role of industry characteristics, the effect of U.S. tax change, exchange rate levels, and the bidder's experience. They found that, 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. These findings indicate that target gains in cross-border acquisitions are higher, when the U.S. dollar is weak relative to a foreign buyer's currency. They 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, 1970-1987. They also argue that these results are not consistent with Scholes and Wolfson's (1990) tax hypothesis that, while the Economic Recovery Act of 1981 substantially increased tax incentives for U.S. takeovers by U.S. firms, after the 1986 Tax Reform Act, foreign investors should find investment in the U.S. more attractive than before and such investors place a higher value on the assets held by U.S. investors than U.S. investors place on them.

Cebenoyan, Papaioannou, and Travlos (1991) examine the wealth effects of the announcement of acquisition bids made by foreign bidders to U.S. firms and how they compare to the wealth effects produced by domestic bids to U.S. firms. To investigate this, they argue that, if the market anticipates foreign bidders to generate superior wealth gains compared to domestic bidders, this should be reflected in the structure of excess returns that result from the acquisition announcement price reaction of the stocks of target firms acquired by foreign and domestic firms, respectively. However, the potential of foreign MNEs to generate superior gains through cross-border expansion is not, by itself, sufficient to ensure that foreign bidders pay larger acquisition premia for U.S. target firms than their domestic rivals. For this

to happen, it is necessary that competition in the corporate acquisitions market be sufficiently strong to enable the target firm shareholders to share the excess takeover gains the foreign bidder is expected to produce. The findings show that U.S. target shareholders realize significant and positive wealth gains from foreign bids (28.66%) in line with those realized from domestic bids (22.41%). They also find that the magnitude of the gains from foreign bids relative to those from domestic bids increases with competition. Furthermore, the findings suggest that market reaction is not affected by the asset or industry specificity of the U.S. targets. The evidence supports theories postulating gains from corporate multinationalism, and a competitive structure in the corporate acquisitions market.

The Economist (1989) also reports that foreign acquirers pay substantially higher premiums for companies in the U.S. because of the willingness of foreign buyers to pay a higher premium to avoid a hostile takeover battle, the cultural differences, and accounting advantages.

The purpose of this paper is to develop a simple model to explain the reasons for higher premiums paid for U.S. target firms by foreign acquiring firms. In view of previous literature on FDI, foreign direct investment is the product of such factors as 1) imperfections in the product and factors markets, 2) different tax systems among countries, and 3) imperfections in the international financial markets [Doukas and Travlos (1988)]. However, as Kogut (1983) argues, the primary advantage of the multinational firm, as differentiated from a national corporation, lies in the flexibility to transfer resources across borders through a globally maximizing network. In the same vein, we postulate that the extra sources of synergy, which can be generated only through foreign takeovers, stem from the valuable options for the foreign MNEs to take advantage of the following three types of market imperfections through a multinational network:

- (1) Deviation from purchasing power parity.
- (2) Double tax deductions for foreign acquisition debt.
- (3) Intangible assets owned by a foreign acquirer or a target firm.

In addition to constructing the analytical framework to explain the valuation effect of foreign takeovers, we also provide an empirical study of 1) whether or not foreign acquirers pay higher premiums than do domestic competitors, and 2) if the higher premiums paid to U.S. target shareholders are explained by the hypothesized extra sources of synergy through foreign takeovers, which are suggested by the model.

The remaining of this study is organized as follows. In Chapter 2 we develop a simple model to explain the reasons for the higher wealth gains of domestic target shareholders involved in foreign takeovers, and also derive testable hypotheses from the model. In Chapter 3, we discuss the sample and methodology used in the study. In Chapter 4, we examine the empirical results. Finally, summary and concluding remarks are presented in Chapter 5.

## Chapter 1 – Endnote

- <sup>1</sup> These figures are estimated by using bid premium data reported in Mergerstat Review (1988). In here, target premiums are not abnormal returns earned by target firms at the announcement date. They are simply defined as percentage that the price paid exceeds the market price of the target firm before offer.
- <sup>2</sup> In contrast, Cakici, Hessel, and Tandon (1990) reported that merger premiums (22%) resulting from foreign acquisitions in the U.S. are nearly the same as those obtained in domestic acquisitions. They also found that, while exchange rate level and the accounting and financial variables of the target firms have not resulted in higher acquisition premiums for U.S. target firms, the industry of the target and the host country variables have a positive relation to the target premiums.

## Chapter 2

### The Model and Testable Hypotheses

Consider an open economy in which there are two countries, each with its own currency. We assume that world capital market is partially segmented and the source of market segmentation is government regulation which would forbid any foreign direct investment (including foreign portfolio investment) to individual investors. However, firms' international transfers of financial capital are free.

Even though private individuals don't trade any foreign equity, they are allowed to buy and sell foreign government bonds. International bond market is perfectly open. In this sense, the capital markets in this economy is partially segmented.<sup>1</sup>

Since the pricing of risk *per se* is not the main objective of the study, we simply assume that investors are risk-neutral. Even if all investors of both countries are risk-averse, the assumption of risk-neutrality can be accommodated by interpreting all future cash flows in the model as the certainty equivalents of the corresponding risky cash flows. It is also assumed that there is only a single commodity traded, while each country has a different inflation rate. This commodity is used by individuals as a consumption good and by firms as an input to the production of uncertain amounts of the commodity. The commodity is homogeneous across countries. We use a single-period model. All corporate decisions are made at the beginning of the period, indexed by  $T=0$ , and the payoff from those decisions will occur at the end of the period, indexed by  $T=1$ .

Our simple scenario assumes that the parent firm of the MNE in country 1 attempts to take over the target firm in country 2 where the MNE already has its operating subsidiary. From now on, we define country 2 as "domestic" and country 1 "foreign".

We shall now consider the additional sources of synergy generated by foreign acquisition, which is not attainable through domestic takeovers, in order to explain the valuation effect of foreign takeovers.

## 2.1 Financial Synergy from a Violation of PPP

The weakness of the dollar in relation to many other major currencies and the surge in foreign takeovers of U.S. firms have regenerated interest in the effects of exchange rate changes on the direction and magnitude of foreign direct investment flows. Until recently, the international economics and finance literature has in general observed that a devaluation of the home currency will in fact make foreign direct investment less attractive, while a devaluation of the host currency will make foreign direct investments more profitable. That is, firms from the strong-currency area will undertake FDI in weak-currency countries (Aliber (1970), Kohlhagen (1979), Caves (1982), Harris and Ravenscraft (1991)).<sup>2</sup>

Rao (1988) presents the evidence that, while holding constant the control variables, the degree of merger activities in the U.S. of most countries examined and exchange rates are significantly associated. We can also find a similar argument from nationwide media such as the *Wall Street Journal*. For example, Sesit (1988) in the *Wall Street Journal* points out that the increased strength of the yen in relation to the U.S. dollar was the main reason for almost \$6 billion of Japanese acquisitions in the U.S. during 1987.

In this section, we develop a simple model to show that, when a devaluation of the host currency brings a partial or no adjustment of both domestic and foreign prices, the violation of purchasing power parity (PPP) due to a devaluation of the host currency will facilitate foreign acquisitions of local firms in the host country. Furthermore, the model will show that if a change in the exchange rate is instantaneously followed by a full adjustment of domestic and/or foreign prices to PPP, the MNE will not perceive any incentives from exchange rate changes with respect to its foreign direct investment decisions.

The variables and notations to be used in this section are the following:

$e_T$  = the spot nominal exchange rate at T (the number of units of currency 1 per one unit of currency 2),

$E_T$  = the spot real exchange rate at T (the number of units of currency 1 per

one unit of currency 2),  
 $r$  = the domestic nominal interest rate,  
 $r^*$  = the foreign nominal interest rate,  
 $P_T$  = the domestic commodity price at T,  
 $P_T^*$  = the foreign commodity price at T,  
 $\pi$  = the domestic inflation rate,  
 $\pi^*$  = the foreign inflation rate,  
 $a$  = the domestic real interest rate,  
 $a^*$  = the foreign real interest rate.

We assumed that there is only one traded good in the economy.<sup>3</sup> Since markets for the commodity are internationally open, in equilibrium, the spot exchange rate,  $e_T$ , obeys PPP as follows:

$$e_T = \frac{P_T^*}{P_T} \quad (2.1)$$

or

$$\frac{e_T}{e_0} = \frac{1 + \pi^*}{1 + \pi} \quad (2.1a)$$

The real exchange rate,  $E_T$ , is defined as

$$E_T = e_T \frac{1 + \pi}{1 + \pi^*} \quad (2.2)$$

Despite disagreement on some specific issues, there is a consensus as to the general validity of PPP. For example, Gailliot (1970) tested PPP for the U.S. and seven other industrial countries between 1900 and 1967, and found that the theory holds well in the long run, but not as well over shorter time periods. Adler and Dumas (1983), and Frankel (1985) also note that violations of PPP are more the rule than the exception and such violations are expected to persist over time.

The assumption of PPP implicit in eq. (2.1) and (2.2) is that real exchange rates tend to return toward equilibrium values over time. Furthermore, since the model doesn't provide the scope for expected long-run real exchange rates to vary in response to unexpected changes in exogenous real variables, we rule out the

overshooting hypothesis that exogenous shocks cause jumps in the level of the real exchange rate that is expected to prevail in the long run.<sup>4</sup>

Using the empirical evidence, we assume that a deviation from PPP may exist at  $T=0$ , but an adjustment to PPP will eventually occur at  $T=1$ . For the time being, in order to isolate the effect of the exchange rate change, we assume that the economy is tax-free, and the foreign acquiring firm and the target are homogeneous with respect to the technology and marketing skills.

The target firm will produce  $\tilde{X}$  units of the commodity, at  $T=1$ . For the time being, we assume that, since the market is highly competitive, every market participant, whether consumer or firm, regards price as given and no economic agent takes the effect of its behavior on price into account when making a consumption or production decision. That is,  $\tilde{P}_1$  and  $\tilde{X}$  are independent. For simplicity, it is also assumed that fixed costs are zero. Let  $\rho(\tilde{X})$  denote the ratio of average cost to unit price at the output of  $\tilde{X}$ . The proportions of local and imported inputs costs are  $\omega$  and  $\omega^*$  ( $\omega + \omega^* = 1$ ), respectively. Then, the total cost is defined as

$$TC = \tilde{X}(\tilde{P}_1\omega + \frac{\tilde{P}_1^*}{\tilde{e}_1}\omega^*)\rho(\tilde{X}) \quad (2.3)$$

At  $T=1$ , the net cash flow for the target can be written as

$$NCF_1 = \tilde{X}[\tilde{P}_1 - (\tilde{P}_1\omega + \frac{\tilde{P}_1^*}{\tilde{e}_1}\omega^*)\rho(\tilde{X})] \quad (2.4)$$

Since we assumed that PPP always holds at  $T=1$ ,

$$\frac{\tilde{P}_1^*}{\tilde{e}_1} = \tilde{P}_1 \quad (2.5)$$

From eq. (2.4) and (2.5),

$$\begin{aligned} NCF_1 &= \tilde{X}[\tilde{P}_1 - (\tilde{P}_1\omega + \tilde{P}_1\omega^*)\rho(\tilde{X})] \\ &= \tilde{X}\tilde{P}_1[1 - \rho(\tilde{X})] \end{aligned} \quad (2.6)$$

That is, even if the target uses imported inputs,  $\frac{\tilde{P}_1^*}{\tilde{e}_1}\omega^*$ , it will face no real operating exchange risk at  $T=1$  under the assumption that PPP always holds at  $T=1$  and

there is no relative price changes in the one-commodity economy. Because the exchange rate also depends on the difference between the foreign and domestic rates of inflation, the movement of exchange rate exactly cancels the change in the foreign price level, leaving the future cash flows in the domestic currency unaffected.

In equilibrium, the value of the target is expressed in the domestic currency as

$$\begin{aligned} V_o &= \frac{E[\tilde{X}\tilde{P}_1 - \tilde{X}\tilde{P}_1\rho(\tilde{X})]}{1+r} \\ &= \frac{P_o}{1+a}[E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))] \end{aligned} \quad (2.7)$$

By the same process, we can express the value of the target in the foreign market as

$$V_o^* = \frac{P_o^*}{1+a^*}[E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))] \quad (2.8)$$

From eq. (2.7) and (2.8), we define the arbitrage potential from foreign takeover,  $\Delta V_o$ , which represents the difference in value of the target in the two markets, as follows:

$$\begin{aligned} \Delta V_o &= V_o^* - e_o V_o \\ &= [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))] \left[ \frac{P_o^*}{1+a^*} - \frac{e_o P_o}{1+a} \right] \end{aligned} \quad (2.9)$$

Eq. (2.9) shows that, if real interest rates are equal between the two countries and PPP holds, there will be no arbitrage opportunity from foreign acquisitions. Otherwise, the arbitrage potential,  $\Delta V_o$ , depends on both the real interest differential,  $a - a^*$ , and the violation of PPP,  $P_o^* - e_o P_o$ . For the time being, we assume that real interest rates of the two countries are the same, that is,  $a = a^*$ , in order to isolate the effect of deviation from PPP alone.<sup>5</sup>

Then, eq. (2.9) can be rewritten as

$$\begin{aligned} \Delta V_o &= V_o^* - e_o V_o \\ &= \frac{1}{1+a}[E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))](P_o^* - e_o P_o) \end{aligned} \quad (2.10)$$

From eq. (2.10), it is clear that the arbitrage potential,  $\Delta V_o$ , will be zero if PPP holds.

Thus, unless PPP is violated, the MNE wouldn't perceive any incentive to purchase the target. Shapiro (1989) argues that the economic sector of economy in which a firm operates (export, import competing, or purely domestic), the sources of the firm's inputs (imports, domestic traded or nontraded goods), and fluctuations in the real exchange rate are important factors in delineating the effects of exchange risk on the value of a firm. However, in this model, the first two factors are not as important as in the real world, because we assumed that PPP always holds at  $T=1$  and there is one commodity. Hence, we will focus primarily on the impact of a change in the real exchange rate on the value of the target in the two markets.

From this point of view, we will investigate the effects of a devaluation of the domestic currency on the incentive of the MNE to acquire a domestic company in the different plausible market situations, depending on the degree of the flexibility of domestic and foreign prices.

Suppose the domestic price rises and the foreign price falls by  $\lambda$  and  $\lambda^*$ , respectively, due to a devaluation of the domestic currency by  $\phi$ . Then,

$$\begin{aligned} e'_o &= (1 - \phi)e_o \\ P'_o &= (1 + \lambda)P_o \\ P_o^{*'} &= (1 - \lambda^*)P_o^* \end{aligned} \quad (2.11)$$

At first, we assume that an exchange rate change is instantaneously followed by the perfect adjustment of the new domestic and foreign prices to PPP. That is, the new exchange rate, domestic and foreign price,  $e'_o$ ,  $P'_o$ , and  $P_o^{*'}$ , again satisfy PPP just after a devaluation occurs as follows:

$$e'_o = \frac{P_o^{*'}}{P'_o} \quad (2.12)$$

That is,

$$\begin{aligned} (1 - \phi)e_o &= \frac{(1 - \lambda^*)P_o^*}{(1 + \lambda)P_o} \\ e_o &= \frac{(1 - \lambda^*)}{(1 - \phi)(1 + \lambda)} \frac{P_o^*}{P_o} \end{aligned} \quad (2.13)$$

According to eq. (2.13), the condition that  $\lambda$ ,  $\lambda^*$ , and  $\phi$  lead to PPP is

$$\frac{(1 - \lambda^*)}{(1 - \phi)(1 + \lambda)} = 1 \quad (2.14)$$

If  $\lambda$ ,  $\lambda^*$ , and  $\phi$  satisfy condition (2.14), which means full adjustment of  $e'_o$ ,  $P'_o$ , and  $P_o^{*'}$  to PPP, the arbitrage potential will disappear again because

$$\begin{aligned} \Delta V'_o &= V_o^{*'} - e'_o V'_o \\ &= \frac{1}{1 + a} [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))](P_o^{*'} - e'_o P'_o) \\ &= 0 \end{aligned} \quad (2.15)$$

Therefore, we can say that an instantaneous perfect adjustment of a domestic and/or foreign price (due to a devaluation of the host currency) to PPP will result in no arbitrage potential from foreign takeovers. Intuitively, it is quite obvious that, even though a foreign buyer might be able to acquire the target at a discount because of a devalued domestic currency, the present value of the future income received from its merging subsidiary would decrease when converted into the foreign currency at the new exchange rate. In this sense, the argument that the devalued host currency provides an advantage to the foreign acquirer doesn't always hold, especially when the prices reflect the full extent of the devaluation.

Second, we assume that a devaluation of a domestic currency has no effect on either domestic or foreign prices. That is,  $\phi > 0$ , but  $\lambda = \lambda^* = 0$ .<sup>6</sup>

Then, we can see that the new exchange rate,  $e'_o$ , deviates from PPP. Since  $\phi > 0$ , and  $\lambda = \lambda^* = 0$ ,

$$\begin{aligned} (1 - \phi)e_o &< \frac{(1 - \lambda^*)P_o^{*'}}{(1 + \lambda)P_o} \\ \Rightarrow e'_o &< \frac{P_o^{*'}}{P'_o} \end{aligned} \quad (2.16)$$

From inequality (2.16), it follows that

$$\begin{aligned} \Delta V'_o &= V_o^{*'} - e'_o V'_o \\ &= \frac{1}{1 + a} [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))](P_o^{*'} - e'_o P'_o) > 0 \end{aligned} \quad (2.17)$$

Inequality (2.17) implies that as a result of a devaluation, the arbitrage potential from foreign takeovers,  $\Delta V'_o$ , will be positive in this case. In other words, a devaluation of domestic currency will enable the parent firm of the MNE to acquire the target at the lower price than an equivalent firm in its home country, as long as the offer price for the target is less than  $V_o^{**}$ .

The arbitrage potential from foreign takeovers,  $\Delta V'_o$ , can be also written as a function of the size of devaluation,  $\phi$ ,

$$\begin{aligned}\Delta V'_o &= V_o^{**} - e'_o V'_o & (2.18) \\ &= \frac{1}{1+a} [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))](P_o^{**} - e'_o P'_o) \\ &= \frac{1}{1+a} [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))](P_o^{**} - (1-\phi)e_o P_o)\end{aligned}$$

From eq. (2.18),

$$\frac{\partial(\Delta V'_o)}{\partial\phi} > 0 \quad (2.19)$$

That is, the effect of a devaluation on the advantage through foreign takeover is then unambiguously positive.

Under the assumption that a change in the exchange rate has no effects on either domestic or foreign prices, a weak domestic currency would provide a unique benefit, which cannot be expected from domestic takeovers, to the foreign acquiring company.

So far, we have assumed that as the domestic currency is devalued, an instantaneous and perfect adjustment or no adjustment of domestic and foreign prices to PPP occurs. However, referring to the empirical evidence on the validity of PPP, we know that these two cases are very unusual even in a floating exchange rate regime.

Therefore, we assume that as a result of a devaluation, a partial and slow adjustment of domestic and foreign price to equilibrium will occur. That is, as a result of a devaluation of size  $\phi$ , the domestic price rises and the foreign price falls by  $\lambda$  and  $\lambda^*$ , respectively, but not to the full extent of the devaluation. The domestic and foreign prices still deviate from PPP, as in a typical case. It is now

possible to determine the conditions under which a change in the exchange rate would enable the foreign buyers to exploit an arbitrage opportunity through foreign takeovers in a more typical scenario. In order for  $\Delta V'_o$  to be positive, the following two conditions are required:

- (1)  $\phi$ ,  $\lambda$ , and  $\lambda^*$  are all positive and less than 1
- (2)  $(1 - \phi) < \frac{(1 - \lambda^*)}{(1 + \lambda)}$

Condition (1) implies that a change in the exchange rate has an effect on both domestic and foreign prices. It rules out the second case where neither domestic nor foreign prices make any response to the exchange rate change. The second condition implies that

$$(1 - \phi)e_o < \frac{(1 - \lambda^*)P_o^*}{(1 + \lambda)P_o} \quad (2.20)$$

$$\Rightarrow e'_o < \frac{P_o^{*'}}{P'_o}$$

More specifically, since partial adjustment of prices due to a devaluation of the domestic currency to equilibrium occurs, the prices deviate from PPP to some degree, as in eq. (2.20). This implies that a foreign acquirer could purchase the target at lower price in the host country than in the home country. The result of this case is exactly the same as that of the second case where a devaluation of a domestic currency has no effect on either domestic or foreign prices.

Thus, if  $\phi$ ,  $\lambda$ , and  $\lambda^*$  satisfy these two conditions, a foreign acquirer could gain positive arbitrage potential,  $\Delta V'_o$ , through foreign acquisition as follows:

$$\begin{aligned} \Delta V'_o &= V_o^{*'} - e'_o V'_o \\ &= \frac{1}{1 + \alpha} [E(\tilde{X}) - E(\tilde{X} \rho(\tilde{X}))](P_o^{*'} - e'_o P'_o) > 0 \end{aligned} \quad (2.21)$$

In this case, it is clear that a devaluation of host currency will be an additional source of synergy for a foreign acquiring company, which is not attainable through domestic acquisition, thereby encouraging foreign buyers to bid for target firms in the host country.

The results of our simple analysis suggest the following hypothesis ( $H_1$  is the hypothesis to test the existence of the valuation effect of foreign takeovers, which we will introduce in the following section 2.5):

*$H_2$ : Target wealth effects are an increasing function of the degree of deviation of exchange rates from those consistent with PPP.*

In this study, all hypotheses are based on the presumption that target stockholders capture the majority of the synergistic gains from foreign takeovers, and the wealth gains of target shareholders are a function of the factors that can create the synergistic gains from successful foreign acquisitions. Therefore, our hypotheses and empirical works will be based on the relationship between the wealth gains of target shareholders and the synergy-generating factors. We'll discuss the relations among the total synergy from foreign takeovers, the wealth gains to target stockholders, and synergy-creating factors in the following section 2.4 in detail.

Presumably, although the second condition,  $(1 - \phi) < \frac{(1 - \lambda^*)}{(1 + \lambda)}$ , rules out the possibility, there may exist the case where either domestic or foreign prices respond to a devaluation of the domestic currency so sensitively that

$$(1 - \phi) > \frac{(1 - \lambda^*)}{(1 + \lambda)} \quad (2.22)$$

$$\Rightarrow e'_o > \frac{P_o^{*'}}{P'_o}$$

Expression (2.22) indicates that, given a devaluation, the MNE's expansion of its foreign subsidiary by foreign takeover will become less attractive because  $\Delta V'_o < 0$ . However, this may not be a typical case.

Up to now, we have assumed that the real interest rates of the two countries are the same, even though there exists the possibility of a deviation from PPP. From now on, we consider another source of arbitrage potential, which is the real interest differentials between the home and host countries. In order to isolate the effect of the real interest differential, we assume that the exchange rate,  $e_o$ , will always satisfy purchasing power parity conditions, but that there exists a real interest

differential between the domestic and foreign country. Then, we can redefine the arbitrage potential,  $\Delta V_o$ , which is expressed in eq. (2.9), as follows:

$$\begin{aligned}\Delta V_o &= V_o^* - e_o V_o \\ &= [E(\tilde{X}) - E(\tilde{X}\rho(\tilde{X}))] \frac{e_o P_o}{(1+a)(1+a^*)} \Delta a\end{aligned}\tag{2.23}$$

where  $\Delta a =$  the real interest differential,  $a - a^*$ .

As eq. (2.23) shows, the arbitrage potential,  $\Delta V_o$ , is a function of the real interest differential between home and host country,  $\Delta a$ , when PPP holds. This result is consistent with the capital-arbitrage hypothesis of international economics that the MNE pursues profits by moving equity capital from countries where its return is low to countries where it is high [Caves (1982)].

This capital-arbitrage hypothesis has been quite controversial. Hymer (1960) argues that this hypothesis is inconsistent with several obvious patterns in the behavior of MNEs. For example, it cannot explain why MNEs move in all directions across national boundaries, and some countries are both home bases for many MNEs and hosts to many subsidiaries controlled abroad. Hence, Caves (1982) concludes that the capital-arbitrage hypothesis, without something more, is neither satisfying theoretically nor accurate empirically.

Even though the capital-arbitrage hypothesis is not sufficient enough to explain all the patterns in the behavior of MNEs, the real interest differentials which may represent the differences in the marginal productivity of capital among countries can provide the MNEs with another incentive to purchase local companies in the host country. Based on eq. (2.23), we hypothesize that the wealth gains of target shareholders are positively related to the real interest differential,  $\Delta a$ . Since the real interest differential and the degree of a deviation from PPP are linked to each other through international parity conditions, we focus mainly on the target wealth effect of a violation of PPP, and consider the "real interest differential" hypothesis as a supplementary one. Hence, we present the result of an empirical test on the real interest differential argument in the Appendix.

## **2.2 Double Tax Deductions for Foreign Acquisition Debts**

The claim that the tax system favors acquisitions has been a familiar and important element of the long-standing public policy debate concerning the social value of corporate acquisitions. Before the Tax Reform Act of 1986, the three most commonly cited sources of tax gains from mergers and acquisitions were as follows:

- (1) the change in asset basis available through taxable acquisitions
- (2) the use of net operating losses available through nontaxable acquisitions
- (3) the tax deduction for interest expenses paid on funds borrowed to finance acquisitions.

Hayn (1989) provides empirical evidence that tax attributes of target firms are significant in explaining the abnormal returns to shareholders of both target and acquiring firms following acquisition announcements. The findings suggest that the most important tax attribute in tax-free acquisitions is the amount of net operating loss carryforwards and tax credits due to expire. They also indicate the most important tax attribute in taxable acquisitions is the step-up in the acquired assets' basis.

However, the 1986 Tax Reform Act repealed the General Utilities doctrine, and the 1987 and 1988 Tax Acts further restricted the firm and its shareholders from avoiding a corporate-level capital gains tax on the sale of appreciated assets [Scholes and Wolfson (1992)]. Furthermore, the 1986 Tax Reform Act severely restricted the use of net operating loss carry-overs.

Unlike the above two tax gains, the argument that the tax deductibility of interest expenses on acquisition debts encourages acquisitions is controversial. Since the 1960s, a number of bills have been introduced in Congress that would deny an interest deduction to one or another form arising from acquisitions.<sup>7</sup> Especially, in 1989, Congress killed some tax breaks for leveraged acquisitions financed with high yield junk bonds.<sup>8</sup> In addition, the 1986 Act had a negative impact on the U.S. tax benefit of the interest deductions for acquisition debts by reducing the U.S.

corporate income tax rates from 46 to 34 percent.

Gilson, Scholes and Wolfson (1988) argued that the claim has nothing to do with mergers and acquisitions because it simply says that there is a tax advantage to increased debt because interest payments are tax deductible; rather, it calls forth the debate over whether the presence of taxes alters the optimal capital structure for the firm. Since the debate on the relation between the optimal capital structure and debt financing for the acquisition is beyond the scope of this paper, we will not address this issue further.

However, in an international setting, since a foreign acquirer may create an extra tax benefit if the interest incurred to finance the acquisition of a U.S. company is deductible in its home country, the argument that tax considerations motivate foreign acquisitions of U.S. companies could be quite attractive. Haas and Karls (1989) are the first to point out that it is possible to get double tax deductions for acquisition-related interest expenses incurred by foreign acquirers of U.S. target firms. One primary vehicle is the creation of a third country subsidiary to finance the deal when tax treatment of such units is favorable.

In this section, we now construct an analytical framework to explain how a foreign acquirer can get double tax deductions, following the typical plan suggested by Haas and Karls (1989).

In order to isolate the tax advantage for foreign buyers alone, we ignore the possibility of a foreign acquirer achieving operating synergy. The exchange rate is also assumed to be in equilibrium. We assume that there are three countries in the world, each with its own currency.

Since we introduce the third country into the model, we use the new definitions and notations in this section as follows:

$\tilde{e}_{iT}$  = the nominal spot exchange rate at T (the number of units of currency i per one unit of currency 2),

$t_i$  = the corporate income tax rate of country i,

$w_i$  = the withholding tax rate of country i imposed on foreign investors,

$r_i$  = the nominal interest rate of country i,

$\tilde{Y}_j$  = net operating income of firm  $j$  at  $T=1$ ,

$\hat{V}_o$  = the successful tender offer price (in terms of currency 2).

Consider a foreign acquirer which is located in country 1. Its operating subsidiary is engaged in active business in country 2 where the target firm resides. For simplicity, we assume that the foreign acquirer has sufficient debt capacity. The foreign buyer borrows 100% of the acquisition cost,  $\hat{V}_o^*(= e_{11}\hat{V}_o)$ , (in terms of currency 1) from bond markets in its home country, and establishes a management and financing center (MFC) in country 3.<sup>9</sup> The role of the MFC is to provide financial and other managerial services to its sister operating subsidiary in country 2. The foreign acquirer locates the MFC in the country which exempts interest income of foreign subsidiaries received from affiliated companies that are engaged in active business in other countries.<sup>10</sup>

The foreign acquirer provides the MFC with the borrowed funds as equity of MFC,  $\hat{V}_o$ . Then, the MFC lends its funds,  $\hat{V}_o$ , at the interest rate of  $r_2$ , to its sister operating subsidiary in country 2 where the target firm resides. We assume that the tender offer by the operating subsidiary of a foreign acquirer is successful at  $T=0$ .

For simplicity, it is assumed that the net operating incomes of the parent firm and its merging operating subsidiary at  $T=1$  will be high enough to cover the interest payment on all debts of each firm. That is,  $\tilde{Y}_1$  and  $\tilde{Y}_2$  will be high enough for the two firms to take advantage of tax deductibility of interest payments on their acquisition debts. The home country of a foreign acquirer is assumed not to enact provisions similar to the U.S. Subpart F of the 1962 Revenue Act,<sup>11</sup> which in general taxes a U.S. parent corporation on unrepatriated passive earnings of its foreign subsidiaries as if the U.S. parent had received a dividend. It is also assumed that the interest income, which the third country MFC receives from the operating subsidiary, is subject to withholding tax of the country 2 and its tax rate is  $w_2$ .<sup>12</sup>

At  $T=1$ , the foreign acquiring firm deducts the interest expense on its acquisition debt,  $r_1\hat{V}_o\tilde{e}_{11}$ , in the currency 1 in its home country. The tax saving on the

interest payments for the parent firm in the home country will be

$$TS^* = t_1 r_1 \hat{V}_o \tilde{e}_{11} \quad (2.24)$$

where  $TS^*$  = home-country tax shield from interest expenses on acquisition debts.

Meanwhile, after acquiring the target, the operating subsidiary will also pay the interest expense on the acquisition debt lent by the third country MFC,  $r_2 \hat{V}_o$ , and obtain the tax benefit of its interest deduction in the host country as follows (in terms of currency 2):

$$TS = t_2 r_2 \hat{V}_o \quad (2.25)$$

where  $TS$  = host-country tax shield from acquisition interest expenses.

If a domestic bidding firm successfully acquired the target by borrowing the same amount of debt from domestic bond market, it could also get the same amount of tax deduction from the acquisition debt as expressed in eq. (2.25). Thus, the potential gain from double tax deductions through foreign acquisition will be the home-country tax saving from the interest expense on acquisition debt for the foreign acquiring company, as expressed in eq. (2.24).

Since the foreign buyer locates its MFC in the third country, where there exists no tax on the interest income of foreign subsidiary received from affiliated company, its MFC doesn't need to pay any tax on the interest income received from the operating subsidiary. However, since the interest income received from the operating subsidiary is subject to withholding tax of the host country, it will have to pay the withholding tax on the interest income as follows (in terms of currency 2):

$$WT = w_2 r_2 \hat{V}_o \quad (2.26)$$

where  $WT$  = withholding tax on the interest income received from the operating subsidiary in country 2.

Furthermore, when the MFC remits the interest income to the parent firm as a dividend, the parent firm will pay the income tax on the dividend repatriations from the MFC as follows (in terms of currency 1):

$$TD^* = t_1 r_2 \hat{V}_o \tilde{e}_{11} \quad (2.27)$$

where  $TD^*$  = home-country tax on the repatriated dividend.

From eq. (2.24), (2.26) and (2.27), at  $T=1$ , the net tax saving for the foreign acquiring company,  $\psi$ , will be defined as

$$\begin{aligned}\psi &= TS^* - WT - TD^* \\ &= t_1 r_1 \hat{V}_o \tilde{e}_{11} - w_2 r_2 \hat{V}_o \tilde{e}_{11} - t_1 r_2 \hat{V}_o \tilde{e}_{11} \\ &= \hat{V}_o \tilde{e}_{11} (t_1 r_1 - w_2 r_2 - t_1 r_2)\end{aligned}\tag{2.28}$$

Therefore, the financial synergy from the extra tax benefit for the foreign acquirer,  $\Gamma$ , which cannot be obtained by a domestic acquiring firm, will be the present value of the net tax saving,  $\psi$ , as follows:

$$\Gamma = \frac{\hat{V}_o E(\tilde{e}_{11})}{1 + r_1} (t_1 r_1 - w_2 r_2 - t_1 r_2)\tag{2.29}$$

However, in reality, some developed countries fully or partially exempt from tax dividends from foreign subsidiaries.<sup>13</sup> Furthermore, the parent country's tax on foreign source income, which might normally be paid when a dividend is declared by a finance subsidiary, could continue to be deferred until it eventually pays a dividend to the parent firm. Thus, tax payment could be deferred indefinitely if foreign operations continue to grow and require new internal financing from the finance subsidiary. Clearly, MNEs are able to operate a corporate pool of funds for foreign operations without having to repatriate foreign earnings to the parent country.<sup>14</sup> If a foreign acquirer were able to find a new foreign investment opportunity to use this fund, it could defer home-country taxation on the dividend repatriation received from the MFC indefinitely.

In these cases, we can eliminate the home country tax on the dividend repatriation received from the MFC,  $TD^*$ , as defined in eq. (2.27). Then, the net tax saving for a foreign acquirer,  $\psi'$ , will be written as

$$\begin{aligned}\psi' &= TS^* - WT \\ &= t_1 r_1 \hat{V}_o \tilde{e}_{11} - w_2 r_2 \hat{V}_o \tilde{e}_{11} \\ &= \hat{V}_o \tilde{e}_{11} (t_1 r_1 - w_2 r_2)\end{aligned}\tag{2.30}$$

From eq. (2.30), we can see that as long as  $t_1 r_1 > w_2 r_2$ , a foreign acquirer can capture tax benefit from the double tax deductions for acquisition debts. Since this tax option will be exercised only when the tax advantage is positive, the tax advantage for a foreign acquirer,  $\Gamma'$ , will be expressed as follows:

$$\Gamma' = \text{Max} \left[ \frac{\hat{V}_o E(\tilde{e}_{11})}{1 + r_1} (t_1 r_1 - w_2 r_2), 0 \right] \quad (2.31)$$

We define  $(t_1 r_1 - w_2 r_2)$  in eq. (2.31) as the net marginal tax saving from an additional \$1 foreign acquisition debt, *NTS*. Based on eq. (2.31), we can expect that:

*H<sub>3</sub>: As long as the net marginal tax saving is positive, target wealth effects are positively related to the net marginal tax saving,  $t_1 r_1 - w_2 r_2$ .*

Meanwhile, if the MFC paid the income tax on the interest income to the government of the third country, then the income tax rate of the country 3,  $t_3$ , would also matter and this tax could partially erode the tax benefit from the double tax deductions. But, for simplicity, we exclude this case in the model.

### 2.3 Intangible Assets

Hymer (1960) argues that two conditions have to be fulfilled to explain the existence of FDI: (1) foreign firms must possess a countervailing advantage over the local firms to make such investment viable, and (2) the market for the sale of this advantage must be imperfect. A central aspect of the monopolistic advantages sufficient to overcome costs due to lack of information on the local market lies in the ownership of specialized intangible assets such as R&D and advertising skill. These special intangible assets enable product differentiation and process innovations, and offer a substantial edge to MNEs over domestic competitors in the host country [Kim and Thomadakis (1988)].

However, even if a firm may own superior technology or marketing skills, other approach, such as licensing or exporting, will be the preferred alternative for exploiting foreign markets. Then, why should a firm use the intangible assets in

multinational activity? Caves (1982) argues that the answer lies in the problems of market failure associated with arm's-length transactions in intangible assets. These failures deter a successful one-plant firm from selling or renting its intangible assets to other single-plant firms and thereby foster the existence of MNEs. Caves (1982) provides a list of the special characteristics of the market for knowledge which prevent it from being put to efficient use by conventional markets:

- (1) Intangible assets are, at least to some degree, public goods. Once a piece of knowledge has been developed and applied at a certain location, it can be put to work elsewhere at little extra cost and without reducing the amount of the idea available at the original site.
- (2) Transactions in intangible assets suffer from impactedness combined with opportunism.
- (3) An element amplifying the problem of impactedness is uncertainty.

Because of these special characteristics of market for knowledge, the use of external markets will involve substantial transactions costs required to define property rights and to negotiate, monitor, and enforce contracts. Therefore, internalizing the market for intangible assets by establishing foreign affiliates is required to exploit them best. In this sense, such "market failure" imperfections leads to foreign direct investment [Shapiro (1989)].

There are two major modes of entry of MNEs into foreign markets: by green-field investment or by acquisition. Since these two modes of entry can be expected to result in different costs and benefits for the MNE, the choice between building a new plant and acquiring a going concern is an important decision-making that the managers of the MNE will encounter when it enters foreign markets. But this subject is beyond the scope of this study and we won't address it any further. Nevertheless, Zejan (1990) presents the evidence that the more recent the entry into a foreign market, the greater the probability for choosing acquisition.

Following the industrial organizational view of FDI, MNEs are willing to use cross-border acquisitions in order to maximize the value of the firms by capitalizing

on product or factor market imperfection. In this sense, industry characteristics of both the foreign acquiring firm and the target firm may be one of the important factors which determine the level of target premiums, and target wealth effects.

In this section, we model the special advantage of intangible assets owned by a foreign acquirer as an extra source of operating synergy achieved only through foreign acquisition. We assume that the product markets are no longer perfectly competitive. It is assumed that a foreign acquiring firm either stems from or invests in industries with high intangible asset intensities. In order to eliminate the tax and exchange rate effects, we assume that the economy is tax-free and the exchange rate is in equilibrium. In addition, we assume that a firm's value is given as a function of intangible assets such as technology and marketing skills:

$$V_o = v(\mu, \eta) \quad (2.32)$$

where

$\mu$  = the level of technology,

$\eta$  = marketing skills including brand and trademark.

Both  $\mu$  and  $\eta$  are assumed to be nonnegative real numbers which are bounded from above;  $0 \leq \mu \leq \bar{\mu}$ ,  $0 \leq \eta \leq \bar{\eta}$ . We also assume that  $v$  is strictly increasing in  $\mu$  and  $\eta$ :

$$\begin{aligned} \frac{\partial v}{\partial \mu} &> 0 \\ \frac{\partial v}{\partial \eta} &> 0 \end{aligned} \quad (2.33)$$

Suppose a foreign acquiring firm in high-research or large-selling-effort industries at home brings more advanced technology or marketing skills with it than other domestic competitors in the same industries. The firm installs the highest level of technology,  $\bar{\mu}$ , and marketing skill of the highest quality,  $\bar{\eta}$ . After the acquisition, the new value of the target is

$$V_o^* = v(\bar{\mu}, \bar{\eta}) \quad (2.34)$$

In this type of acquisition, the main source of synergistic gain will be the increase in the value of the target. Then, we can define the operating synergy

generated by the superior intangible assets brought by a foreign acquirer,  $\Delta V_o^*$ , as follows:

$$\Delta V_o^* = v(\bar{\mu}, \bar{\eta}) - v(\mu, \eta) \quad (2.35)$$

Meanwhile, when domestic competitors can install the highest level of technology and advertising skills available in the local industry,  $\hat{\mu}$  and  $\hat{\eta}$ , where  $0 < \hat{\mu} < \bar{\mu}$ , and  $0 < \hat{\eta} < \bar{\eta}$ , the value of the target firm can improve to  $v(\hat{\mu}, \hat{\eta})$ , which is less than  $v(\bar{\mu}, \bar{\eta})$ . Then, we can define the synergistic gain for a domestic acquirer as follows:

$$\Delta V_o = v(\hat{\mu}, \hat{\eta}) - v(\mu, \eta) \quad (2.36)$$

When we compare the operating synergy from foreign acquisition,  $\Delta V_o^*$ , with the synergy from domestic acquisition,  $\Delta V_o$ , we can see that the synergistic gains from superior intangible assets brought by a foreign acquirer,  $\Delta V_o^*$ , will be greater than those of domestic competitors,  $\Delta V_o$ .

Therefore, the empirical implication of the model is that if a foreign acquirer owned specialized intangible assets, it could create an extra synergistic gain from utilizing its monopolistic advantages over domestic competitors in the local market, and, as a result, it could afford to pay a higher premium for the target than domestic bidding firms. This analysis leads to the following hypothesis:

*H<sub>4</sub>: A foreign acquirer with special intangible assets might offer higher wealth effects to the target shareholders.*

On the other hand, for foreign acquiring firms, it is possible in some cases that the causation runs the other way: a foreign MNE which is relatively weak in technology or marketing buys a going firm in the host country with the requisite advantages [Lall and Siddharthan (1982)].

Even in the domestic market for the corporate control, as Link (1988) argues, U.S. manufacturing companies that constantly need new technologies to compete effectively seldom are willing to bet their entire futures on in-house research and development. Even the firms most committed to R&D for innovation consider

mergers and acquisitions to be among their primary alternatives for advancing their technological proficiencies.<sup>15</sup>

If technology or marketing skill is an important factor in the success in local and global markets, but a foreign firm does not possess it, a desire to acquire intangible assets in the host country may also be an important motive for foreign takeovers. Foreign takeover of an existing firm offers a good opportunity for the acquisition of intangible assets in the host country unless it violates the host country's regulation of foreign investments to protect its national security from the threat of foreign ownership, such as U.S. Exon-Florio provision.<sup>16</sup>

Therefore, it is very likely that, since access to these intangible assets is quick and at times cheapest through foreign acquisition, foreign acquirers are willing to pay higher premiums for the target firms with valuable intangible assets. Furthermore, additional benefits stemming from cross-border takeovers may also be expected when multinational operations help ensure rapid dissemination of the acquired new technology or marketing skills within a multinational firm through its global network.

These arguments suggest that:

*H<sub>5</sub>: A foreign acquirer might offer higher wealth effects for the target firm with valuable intangible assets.*

## **2.4 Total Synergy and Target Wealth Gains**

In this study, our basic approach is based on the presumption that target stockholders capture the majority of the synergistic gains from foreign takeovers, and the wealth gains of target shareholders are a function of the factors which can create the synergistic gains through successful foreign takeovers. Therefore, our hypotheses and empirical works focus mainly on the relationship between the wealth gains of target shareholders and the synergy-generating factors. In this section, we clarify the relations among the total synergistic gains from foreign takeovers, the wealth gains to target stockholders, and synergy-creating factors in detail.

The takeover of a firm is defined to be the purchase of the majority of its equity (51% or more of the total shares outstanding). Successful takeovers will be value-increasing transactions for the stockholders of target firms and will result in the optimal allocation of the target resources.<sup>17</sup> The successful bidder is assumed to be the one that can effect the highest synergistic gains in the tender offer contests [Bradley, Desai, and Kim (1988)].

We define the total synergy generated from a successful foreign takeover as the sum of the change in the wealth of the stockholders of the domestic target and foreign acquiring firms.<sup>18</sup> We postulate that the total synergy from foreign acquisitions is a function of the hypothesized synergy-generating factors such as deviation from PPP, double tax deductions for foreign acquisition debts, and intangible assets. That is,

$$\Delta S = \Delta V_A + \Delta V_T \quad (2.37)$$

$$\Delta S = f(\chi) \quad (2.38)$$

where

$\Delta S$  = total synergy from successful foreign takeovers,

$\Delta V_A$  = the wealth gains of foreign acquirers,

$\Delta V_T$  = the wealth gains of domestic target shareholders,

$\chi$  = a vector of synergy-creating factors.

Many of previous studies in the acquisition literature present the evidence that most of the synergistic gains through corporate acquisitions are captured by the stockholders of target firms, and bidders on average realized small gains of about 1 to 2 percent or statistically insignificant losses in the announcement period [Jensen and Ruback (1983), Jarrell and Poulsen (1987), Bradley, Desai, and Kim (1988), and Jarrell, Brickley, and Netter (1988)]. For example, Jarrell and Poulsen (1987) report that excess returns to shareholder of acquiring firms are positive five percent and statistically significant during the 1960s, and still significant, positive average of 2.2 percent over the 1970s. However, 159 cases from the 1980s show statistically significant losses to bidders.

Jarrell, Brickley, and Netter (1988) argue that the secular decline in the stock returns to bidders probably reflects the increased competition among bidders and the rise of auction-style contests during the 1980s. They also suggest that Federal (Williams Act) and state regulations of tender offers facilitate the competition among bidders because they impose disclosure and delay rules that foster multiple-bidder, auction contests and preemptive bidding.

Unlike domestic market for corporate control, we have no empirical evidence on how the distribution of foreign takeover gains is determined between the shareholders of domestic targets and foreign acquiring firms in the global market for corporate acquisition. Therefore, using the empirical results of domestic acquisitions, we assume that a high proportion of synergistic gains from foreign takeovers will be captured by domestic target shareholders, because of the increased competition among bidders (foreign versus domestic bidders, or foreign versus foreign bidders), and preemptive bidding. Furthermore, we assume that the wealth gains of domestic target shareholders,  $\Delta V_T$ , is also a function of the hypothesized synergy-generating factors. Thus,

$$\Delta V_T = \alpha \Delta S \quad (0 \leq \alpha \leq 1) \quad (2.39)$$

$$\Delta V_T = f(\chi) \quad (2.40)$$

where

- $\Delta S$  = total synergy from successful foreign takeovers,
- $\Delta V_T$  = the wealth gains of domestic target shareholders,
- $\alpha$  = a proportion of total synergy to target shareholders,
- $\chi$  = a vector of synergy-creating factors.

Based on these assumptions, we test for the role of the hypothesized extra sources of synergy from successful foreign acquisitions, such as the degree of deviation from PPP, double tax benefit for foreign acquisition debts, and intangible assets of foreign acquiring and domestic target firms, in explaining the wide disparity in U.S. target abnormal returns.

## 2.5 Testable Hypotheses

We now summarize the hypotheses presented in the previous sections.

### Hypothesis 1:

*On average, target wealth gains are higher in foreign takeovers than in domestic takeovers.*

We will test this Hypothesis 1 to find out if there exists a differential valuation effect of foreign takeovers on target wealth. The following Hypothesis 2 is related to the PPP argument.

### Hypothesis 2:

*Target wealth effects are an increasing function of the degree of deviation of exchange rates from those consistent with PPP.*

We will test the following Hypothesis 3 in order to identify the effect of differential tax systems on the target wealth.

### Hypothesis 3:

*As long as the net marginal tax saving is positive, target wealth effects are positively related to the net marginal tax saving,  $t_1r_1 - w_2r_2$ .*

The final two hypotheses are associated with the intangible asset arguments. Hypothesis 4 tests the relationship between the special intangible assets brought by a foreign acquirer and the target abnormal returns. On the other hand, Hypothesis 5 is to test the relationship between the valuable intangible assets of the target firm and the wealth gains of target shareholders in foreign takeovers.

### Hypothesis 4:

*A foreign acquirer with special intangible assets might offer higher wealth effects to the target shareholders.*

**Hypothesis 5:**

*A foreign acquirer might offer higher wealth effects for the target firm with valuable intangible assets.*

## Chapter 2 – Endnote

- <sup>1</sup> The assumption of partial segmentation is necessary only for the following section 2.1 where we discuss financial synergy from a violation of PPP. The reason is that, unless an international equity market is segmented, individual investors themselves can take advantage of a violation of PPP by trading foreign and domestic stocks, and don't need to depend on FDI of MNEs. For a more rigorous definition of partial segmentation in the state-preference model, see Thomadakis and Usmen (1992).
- <sup>2</sup> Caves (1982) notes that many writers have pointed to the positive relation between a strong dollar and increased foreign direct investments by U.S. firms. Similarly, a weak dollar is associated with increased direct investments by foreigners in the United States.
- <sup>3</sup> Grauer, Litzenberger and Stehle (1976), Kouri (1978), and Fama and Farber (1979) also make the same assumption that there exists only one good in the world. The assumption that the world can be modeled as if there exists only one commodity is called the assumption of 'naive' purchasing power parity [Stulz (1981)]. In this world, we can ignore the problems caused by the combination of differently constructed price indices and relative price changes.
- <sup>4</sup> The hypothesis of time-invariant real exchange rates could be rejected if there were clear evidence that real exchange rates follow random walks. Roll (1979) and Cumby and Obstfeld (1984) have found it difficult to reject the random-walk hypothesis. By contrast, Frankel (1985) succeeds in rejecting the random-walk hypothesis with a sample of 116 annual observations on a price-adjusted exchange rate between the U.S. dollar and the British pound. For further reference, see Isard (1987).
- <sup>5</sup> Roll (1979) has noted that 1) interest parity, 2) an ex ante version of PPP, and 3) the unbiasedness of the forward rates as a predictor of the spot exchange rate are linked to the proposition that real rates are equal across countries. Mishkin (1984) shows that a breakdown in any of these parity conditions can lead to a rejection of the equality of real rates.
- <sup>6</sup> In reality, we can find the similar cases where devaluations are preceded by, or are followed by government price controls.
- <sup>7</sup> In the late 1960s, the consideration in conglomerate acquisitions was frequently some form of convertible subordinated debt. Congress responded then by enacting Internal Revenue Code Section 279 as part of the Tax Reform Act of 1969, which denies a deduction for interest payments in excess of \$5 million on acquisition-related subordinated debt that has an equity feature such as convertibility and is issued by a highly leveraged company. However, Section

279 does not apply to debt that is either unsubordinated or without an explicit equity feature, such as the high-interest rate bonds prominent in the 1980s acquisition market. See Gilson, Scholes, and Wolfson (1988), pp. 293–294.

- <sup>8</sup> For highly risky junk bonds having a yield of 600 basis points above the Treasury rate, the payment now is classified as a dividend and the issuer never can take a deduction from taxes. For further reference, see *Mergers and Acquisitions*, March/April 1990.
- <sup>9</sup> A loan used to buy shares of U.S. companies can be no more than 50 percent of the purchase price if it is collateralized by those shares or other stocks. Foreigners must adhere to these requirements if they take the loan from a U.S. bank or an American subsidiary of a foreign bank. But they can use bank debt to finance the entire purchase if the loan comes from a foreign bank or a foreign subsidiary (not a branch) of a U.S. bank.
- <sup>10</sup> For instance, a few European countries such as Switzerland, the Netherlands, and Liechtenstein exempt all income from foreign subsidiaries. Hong Kong and Panama also tax income from domestic sources, but exempt all income from foreign sources.
- <sup>11</sup> Subpart F subjects U.S. company affiliates that are incorporated abroad to U.S. tax obligations whenever they engage in intracorporate international trade in goods, factors, or services, and regardless of where their profits originate or accumulate. Subpart F only applies to U.S. shareholders of controlled foreign corporations.
- <sup>12</sup> Under the current U.S. tax law, unless the foreign acquirer intends to service the debt out of the earnings of the target firm company (or from other U.S. sources), U.S. withholding tax of up to 30% may be avoided on dividends or interest paid to the foreign acquirer or its finance subsidiary. Furthermore, when the finance subsidiary qualifies as resident in the bilateral tax treaty country, then it can also take advantage of the benefits of the treaty. See BenDaniel and Rosenbloom (1990), pp 205–206, and Haas and Karls (1989).
- <sup>13</sup> For example, Switzerland, Hong Kong, Belgium, France, and the Netherlands have a territorial tax system whereby profits earned by a foreign branch and dividends received from a foreign subsidiary of a domestic corporation are typically exempt from domestic taxation. Meanwhile, some countries, like Germany and Canada, have a territorial system with respect to the income from countries with which they have a tax treaty, and a worldwide tax system (with a provision for credits for foreign taxes paid) with respect to income earned in nontreaty countries. For further reference, see Scholes and Wolfson (1992), pp. 245–252.
- <sup>14</sup> According to Eiteman and Stonehill (1986, p. 650), for U.S. multinational firms, the tax-deferral privilege operating through a foreign affiliate was not originally a tax loophole. On the contrary, it was granted by the U.S. government to allow U.S. firms to expand overseas and place them on a par with foreign competitors, which also enjoy similar types of tax deferral and export subsidies of one type or another.

- <sup>15</sup> A good example is General Electric Co., which decided in the early 1980s to become a supplier of turnkey automated manufacturing systems (AMS). The company's goal was to produce and market all of the components of an automated manufacturing system as a package to be installed and operated by the customer to meet most, if not all, product design and production requirements. But it lacked an important technology used in an AMS, such as computer-aided design (CAD). Instead of developing the needed technology in-house, in order to economize both on time and start-up costs, it purchased that technology by acquiring a number of smaller hardware and software vendors in the automation area, such as Calma Co. in 1981. For further reference, see Link (1988).
- <sup>16</sup> The Exon-Florio provision was prompted, in part, by the sharp increase in foreign acquisitions of American companies during the late 1980s in conjunction with the trend toward globalization of major industries. Named for its sponsors, Sen. James Exon, and Rep. James Florio, the Exon-Florio provision gives the president the authority to investigate the national security implications of proposed foreign acquisitions of U.S. companies. In determining the effect of a foreign acquisition on U.S. national security, the president or his designee may consider a number of factors. They include domestic production requirements related to defense, the capacity of domestic industry to meet national defense requirements, and how the control of domestic industries by foreign entities may affect U.S. capacity to meet the requirements of national security. Thus, Exon-Florio represents a potentially important regulatory hurdle for foreign companies trying to acquire U.S. assets and a possible defense weapon for unwilling targets of bids from overseas.
- <sup>17</sup> Bradley, Desai, and Kim (1983) document that the positive revaluation of the target's shares is permanent only if the offer is successful. This evidence is consistent with the synergy hypothesis of tender offer. Bradley, Desai, and Kim (1988) also find that the average synergistic gain created by the 235 offers in their sample is \$117 million, representing a 7.4% increase in the combined wealth of the stockholders of the target and acquiring firms. This finding is also consistent with the synergy hypothesis and inconsistent with Roll's (1986) "Hubris Hypothesis".
- <sup>18</sup> The assumption behind this definition is that corporate acquisitions through tender offers have no effect on the wealth of the creditors of both the target and acquiring firms. For empirical evidence, see Asquith and Kim (1982).

## Chapter 3

### Sample and Methodology

#### 3.1 Sample

The sample analyzed in this study consists of the following two subsamples: foreign and domestic takeover sample. In order to test Hypothesis 1 to see if there exists a valuation effect of foreign takeovers, we use the domestic takeover sample as a control sample.

##### 3.1.1 Foreign Takeover sample

This sample includes 104 successful foreign takeovers in the U.S. over the 10-year period from 1980 to 1989. A tender offer is considered successful if the foreign bidding firm acquired a majority interest (i.e., more than 50 percent) of the target firm's equity.

The sample is obtained from the following two sources: *The Foreign Acquisitions Roster of Mergers and Acquisitions*, and *Merger Yearbook*. The first public announcement date is defined as the trading date one day before the *Wall Street Journal Index* reports the takeover announcement. If there are multiple bidders in the tender offer process, we use the announcement date of the first offer by the successful acquirer.<sup>1</sup>

The type of acquisition and the payment method are identified from the *WSJ Index* and double checked from the *Dow Jones News/Retrieval On-line Database* and *Mergers and Acquisitions*. In order to check the nationality of the acquiring firm, we use the data from *Worldscope*, *Moody's International Manual*, *Europe's 15,000 Largest Companies*, and *Japanese Company Handbook*.

Each bid in this sample satisfies the following selection criteria:

- (a) The bidders are foreign companies.

- (b) The transactions are completed tender offers, excluding unit sell-offs by U.S. firms to foreign acquirers.
- (c) In order to control for the wealth effects of the payment method, acquisition type, and tax status, which are important empirical findings of the acquisition literature in 1980s [Bradley and Kim (1985), Huang and Walkling (1987), Agrawal and Eytan (1989), and Hayn (1989)], the bid is limited to the cash tender offer.
- (d) The daily returns on the target firm's common stock are available from the *Center for Research in Security Prices (CRSP) NYSE/AMEX Stock File*.
- (e) The first public announcement date, payment method, and type of acquisition are available from *WSJ Index*, or *Dow Jones News/Retrieval On-line Database*.
- (f) The transaction value of the bid exceeds \$1 million. This excludes small bids.

We started with a sample of over 2,124 foreign acquisitions in the U.S., but after considering the selection criteria listed above, the final foreign sample contains 104 completed cash tender offers. The major cause of exclusion was the acquisition of partial ownership interests or the acquisition of a unit of the firm.

The annual distribution of foreign takeover sample grouped by the nationality of the acquiring firm is given in Table 3-1. As shown in Table 3-1, approximately 70 percent, or 70 transactions out of 104 foreign acquisitions are concentrated in the period 1986-1989, when the U.S. dollars has been relatively weak.

In terms of the nationality of the foreign acquiring firms, the United Kingdom dominates the other countries with 39 acquisitions, or 37.5 percent of the sample, followed by Canada with 13 acquisitions, or 12.5 percent. Other large acquirers are Japan with 11 acquisitions (10.6%), France with 11 acquisitions (10.6%), Netherlands with 6 acquisitions (5.8%), Germany with 5 acquisitions (4.8%), Australia with 5 acquisitions (4.8%), Switzerland with 5 acquisitions (4.8%). These 8 industrialized countries accounted for 91.4 percent of the sample. It is also worthwhile to note that, during the period 1986-89, takeover activities by Japanese companies significantly increased and nearly 82 percent of Japanese transactions are clustered in this period, ranking in second place, next to the United Kingdom in the sample.

These statistics on our sample by foreign acquirers' nationality are consistent with the general trend of all foreign acquisitions in the U.S., as presented in Table 3-2.

Moreover, Table 3-3 provides the annual distribution of foreign takeover sample grouped by the size of the target firm. The size of the target firm is defined as the equity value of the target firms as of the announcement date. The data on the stock price and the number of shares outstanding as of the announcement date were collected from *CRSP NYSE/AMEX Stock File*.

As shown in Table 3-3, 82 target firms (79%) of foreign acquisitions have equity value less than \$1 billion, while 22 target firms (21%) belong to the category of more than \$1 billion equity value. Most of these 22 large transactions in the sample are among the 100 largest mergers in U.S. history.

### **3.1.2 Domestic Takeover sample: Control Sample**

This sample is constructed for comparison with the foreign takeover sample. It includes 104 successful domestic takeovers, which is the same number of observations as the foreign takeover sample, during the period from 1980-1989. The sample is collected from the following sources: *Merger Yearbook*, *SEC tender offer database*,<sup>2</sup> and the *Dialog M&A Filings*. Specific announcement information about the type of acquisition and the payment method is double checked with the *WSJ Index*.

Each bid in this sample satisfies the same selection criteria applied to the foreign takeover sample except that the bidders are domestic companies. Furthermore, in order to eliminate the size and time-specific effects, we control for the size of the target firm and the time period of the bid in such a way that the distribution of this control sample is consistent with that of the foreign takeover sample in terms of target-firm size and time period of the bids.

The annual distribution of the domestic takeover sample grouped by the value of the target firm is given in Table 3-4. When it is compared with that of the foreign takeover sample shown in Table 3-3, it is noticed that all cells except for 2 have the same number of observations in the two samples. It was very difficult to

collect the control sample to be perfectly matched with the foreign takeover sample in terms of target-firm size and time period of the bid, because we couldn't find a target firm of \$500 million-\$1 billion equity value in 1980 domestic tender offers. However, we don't think that these few discrepancies between the two distributions are significant enough to explain the different level of target premiums between the two samples.

In order to explain the reasons why targets of foreign acquirers have significantly higher wealth gains than do targets of domestic buyers, we are supposed to match the foreign takeover sample with the domestic one on a one-to-one basis, and then find out the factors which determine the magnitude of the differential wealth effect between the paired target firms, by using the cross-sectional regression analysis. However, practically, it is almost impossible to match targets of foreign acquirers and those of domestic buyers in terms of all other firm-specific factors which are considered to have a significant effect on the level of target wealth gains, such as line of business, the number of bidders, and so on. Hence, we simply use the wealth gains of U.S. target shareholders involved in foreign acquisitions as the dependent variable in the cross-sectional regression model.

## **3.2 Methodology**

We use cumulative abnormal returns (*CAR*'s) on the common stocks of target firms around the announcement date to measure target wealth effect, in order to be consistent with previous studies in this area. Abnormal returns are estimated by using the event-study methodology.

### **3.2.1 Testing Hypothesis 1: Event-Study Analysis**

The Hypothesis 1 that *target wealth gains are higher in foreign takeovers than in the domestic takeovers* is tested by using an event-study methodology similar to that described in Dodd and Warner (1983)<sup>3</sup> and Travlos (1987).

The market model is used as the benchmark for predicting returns. It specifies the following linear relationship between security *j* returns and returns on a market

portfolio:

$$\tilde{R}_{jt} = \alpha_j + \beta_j \tilde{R}_{mt} + \tilde{\epsilon}_{jt} \quad (3.1)$$

where

$\alpha_j, \beta_j$  = the intercept and slope for stock  $j$ , respectively,

$\tilde{R}_{jt}$  = the return on stock  $j$  on day  $t$ ,

$\tilde{R}_{mt}$  = the return on the value-weighted market index on day  $t$ ,

$\tilde{\epsilon}_{jt}$  = the error term for stock  $j$  on day  $t$ .

The estimated abnormal return is given by

$$\hat{\epsilon}_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt}) \quad (3.2)$$

where  $\hat{\alpha}_j$  and  $\hat{\beta}_j$  are the ordinary least squares estimates of  $\alpha_j$  and  $\beta_j$ .

These OLS coefficients are estimated over the period  $t=-150$  to  $t=-31$  relative to the date of the first public announcement. Daily abnormal returns are calculated for each firm  $j$  over the event periods  $t=-30$  to  $t=+5$ . For a sample of  $N$  firms, a daily average residual (AR) each day  $t$  was computed by

$$AR_t = \frac{1}{N} \sum_{j=1}^N [R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}] \quad (3.3)$$

where  $t=-30$  to  $+5$ .

The cumulative average residual,  $CAR_{t_1, t_2}$ , is also determined by summing the  $AR_t$ 's over various intervals:

$$CAR_{t_1, t_2} = \sum_{t=t_1}^{t_2} AR_t \quad (3.4)$$

The expected values of  $AR_t$  and  $CAR_{t_1, t_2}$  are zero in the absence of abnormal performance. The test statistics of  $AR_t$  and  $CAR_{t_1, t_2}$  are based on the average standardized abnormal return,  $ASAR_t$ , and the average standardized cumulative abnormal return,  $ASCAR_{t_1, t_2}$ , respectively, where

$$ASAR_t = \frac{1}{N} \sum_{j=1}^N \frac{R_{jt} - \hat{\alpha}_j - \hat{\beta}_j R_{mt}}{S_{jt}} \quad (3.5)$$

$$ASCAR_{t_1, t_2} = \sum_{t=t_1}^{t_2} ASAR_t, \quad (3.6)$$

and  $S_{jt}$  is the square root of firm  $j$ 's estimated forecast variance computed by

$$S_{jt} = S_j \left[ 1 + \frac{1}{L} + \frac{(R_{mt} - \bar{R}_m)^2}{\sum_{\tau=1}^L (R_{m\tau} - \bar{R}_m)^2} \right]^{\frac{1}{2}} \quad (3.7)$$

where

$S_j$  = the standard deviation of  $\hat{\epsilon}_{jt}$  over the estimation period,

$L$  = the length of the estimation period in days ( $L=120$ ),

$R_{m\tau}$  = the market return for the  $\tau$ th day of the estimation period,

$R_{mt}$  = the market return for day  $t$ ,

$\bar{R}_m$  = the average market return for the estimation period.

Assuming that the individual abnormal returns are normal and independent across  $t$  and across securities, the statistics  $Z_t$  and  $Z_{t_1, t_2}$ , which follow a unit normal distribution, are used to test the hypothesis that the average standardized abnormal returns and the average cumulative standardized abnormal returns equal zero, where

$$Z_t = \sqrt{N} ASAR_t \quad (3.8)$$

and

$$Z_{t_1, t_2} = \sqrt{\frac{N}{t_2 - t_1 + 1}} \sum_{t=t_1}^{t_2} ASAR_t \quad (3.9)$$

In order to test Hypothesis 1 - whether or not the differences in the  $CAR$ 's between the two samples, foreign and domestic takeover samples, are statistically significant, the test statistic,  $Z_d$ , which also follows unit normal distribution, is computed

$$Z_d = \frac{Z_{t_1, t_2}^F \sqrt{N_D} - Z_{t_1, t_2}^D \sqrt{N_F}}{\sqrt{N_F + N_D}} \quad (3.10)$$

where F and D denote the foreign and domestic takeover sample, respectively.

In estimating *CAR*'s of each sample, we use two alternate window lengths. A broad one-month window cumulates abnormal returns from  $t_1 = -22$  to  $t_2 = +1$ . A more narrow one-week window sets  $t_1 = -3$  and  $t_2 = +1$ .

### 3.2.2 Testing Hypotheses 2 through 5: Cross-Sectional Analysis

Tests of the Hypothesis 2 through 5 are to identify a number of factors which determine the higher wealth gains of U.S. target shareholders involved in foreign takeovers. In order to do so, we run the following cross-sectional regression model:

$$CAR_j = \beta_0 + \beta_1 DP_j + \beta_2 NTS_j + \beta_3 ARD_j + \beta_4 TRD_j + \beta_5 EC_j + \beta_6 CN_j + \beta_7 JP_j + \beta_8 MB_j + \epsilon_j \quad (3.11)$$

The first variable expected to affect the magnitude of premium paid to the target shareholders by a foreign acquirer is the degree of deviation from PPP of the foreign acquirer's home currency relative to the U.S. dollar,  $DP_j$  in eq. (3.11).

$DP$  = the degree of deviation from PPP of the foreign acquirer's home currency relative to the U.S. dollar.

In this study, we measure the degree of deviation from PPP in the same way as Summers and Heston (1988) estimate the departures of current exchange rates from those consistent with PPP. Specifically, we first compute the exchange rate of a given foreign acquirer's home currency, which satisfies PPP with the U.S. dollar based on the consumer price indices of both countries on the month of the first announcement date. Then we estimate the degree of deviation from PPP as follows:

$$DP = \frac{e_T^c}{e_T^a} - 1 \quad (3.12)$$

where

$e_T^c$  = nominal exchange rate which is consistent with PPP at T (the number of units of the home currency per one unit of the U.S. dollar),

$e_T^a$  = actual exchange rate at T (the number of unit of the home currency per one unit of the U.S. dollar).

We obtain the data on the monthly CPI's and exchange rates from *United Nations, Monthly Bulletin of Statistics*. For the home currency of a foreign acquirer in each given transaction  $j$ ,  $DP_j$  equals zero if the home currency satisfies PPP with the U.S. dollar at a given period. If  $DP_j$  is positive, it would indicate that a foreign acquirer pay less in the U.S. than in its home country. During the sample periods, 1980-1989, the foreign exchange rates of major currencies relative to the U.S. dollar are given in Table 3-5.

Hypothesis 2 that *target wealth effects are positively related to the degree of deviation of exchange rates from PPP* would lead to the positive coefficient of the degree of deviation from PPP,  $\beta_1$ .

The explanatory variable to represent the potential double tax benefits for foreign acquisition debts is  $NTS_j$  in eq. (3.11). It is defined as follows:

$NTS$  = net marginal tax savings for additional \$1 foreign acquisition debts.

According to Hypothesis 3 that *as long as the net marginal tax saving is positive, target wealth effects are positively related to the net marginal tax saving,  $t_1r_1 - w_2r_2$* , we expect that the sign of the coefficient of the marginal net tax savings,  $\beta_2$ , is positive, as predicted by eq. (2.31) in section 2.2.

We obtain the data on the corporate income tax rates of the foreign countries (see Table 3-6) and U.S. withholding tax rates imposed on interest payments to foreign investors (see Table 3-7) from *Corporate Taxes: A Worldwide Summary, 1980-1990*.

Since a foreign takeover is an important strategic long-term investment of a foreign acquirer, we use the long-term government bond yield of the U.S. and its home country as the proxy for the nominal interest rate of the U.S. and its home

country. We collect the data on the foreign and domestic long-term nominal interest rates from *International Financial Statistics*, and *United Nations, Monthly Bulletin of Statistics*. During the sample periods, 1980-1989, annual yields of long-term government bonds issued by major developed countries are given in Table 3-8.

With respect to the intangible assets, Hypothesis 4 is that foreign acquirers with specialized intangible assets offer higher wealth effects to the target shareholders. In most empirical tests of FDI, R&D and advertising intensities are used as important proxies for the production and ownership of intangible assets. In this study, however, we use only R&D intensity as a proxy for intangible assets because it is very difficult to obtain data on advertising expenses of foreign acquiring firms.  $ARD_j$  in eq. (3.11) is defined as the R&D intensity of the foreign acquiring firm's industry (R&D expenses as a fraction of capital expenditures).

$ARD =$  the R&D intensity of the foreign acquiring firm's industry.

In order to compute the average R&D intensity of the foreign acquiring firm's industry, we collect the data on the industry average of R&D expenses and the capital expenditures over the previous year of the announcement date from *Worldscope - Industrial Companies Profiles* at 2 digit SIC level. Unfortunately, we cannot get more specific data on the industry variables of the foreign acquirers at 3 or 4 digit SIC level.

Based on Hypothesis 4, we expect that the coefficient of R&D intensity of the foreign acquiring firm's industry,  $\beta_3$ , is positive.

In addition, we can consider the effect of R&D intensities on the level of premiums the other way around. For a foreign acquirer, acquisition can prove an attractive entry route in high-research industry if the going firm's research capacity helps to adapt the parent's technological assets to the local market, or if the parent lacks appropriate technology and hopes to make system-wide use of the acquiree's stock [Caves and Mehra (1986)].

This argument leads to Hypothesis 5 that *foreign acquirers offer higher wealth effects for target firms with valuable intangible assets*.  $TRD_j$  in eq. (3.11) is de-

defined as the R&D intensity of the target firm's industry (research and development expenses as a fraction of capital expenditures).

$TRD$  = the R&D intensity of the target firm's industry.

In order to compute the average R&D intensities of the target firm's industry, we obtain the data on the industry averages of R&D expenses and the capital expenditures over the previous year of the announcement date from *Compustat Annual Industrial Files* and *Research Files* at 3 digit SIC level.

Hypothesis 5 suggests that the coefficient of R&D intensity of the target firm's industry,  $\beta_4$ , will be positive.

Some recent studies on the valuation effect of foreign acquisitions report that the nationality of a foreign acquiring firm has an impact on the level of U.S. target abnormal returns because of cultural differences, tariff, and different accounting procedures, which are specific to the home country of the foreign acquirer. Cakici, Hessel, and Tandon (1990) have shown that the highest merger abnormal returns are paid by the Japanese, followed by Canadian, the British, and then the German acquirers.<sup>4</sup> In order to control for those differences stemming from the nationality of the foreign acquirers, we include the following dummy variables for the home countries of the foreign acquirers as control variables in the cross-sectional regression:

EC= dummy variable for an acquiring firm in the European Economic Community (EEC), which is equal to one if its home country is a member of EEC, and zero otherwise,

CN= dummy variable for a Canadian acquirer, which is equal to one if the acquirer is Canadian, and zero otherwise,

JP= dummy variable for a Japanese acquirer, which is equal to one if the acquirer is Japanese, and zero otherwise.

Finally, in order to control for the effect of multiple-bidder contests, which was

shown by Bradley, Desai, and Kim (1988) and Franks, Harris, and Mayer (1988), we introduce the dummy variable,  $MB$ .

$MB$ = dummy variable for multiple-bidder contest, which is equal to one if the tender offer is made in a multiple-bidder contest, and zero otherwise.

Based on prior empirical findings of a significantly positive relation between target abnormal returns and competition among multiple bidders, we expect that the coefficient of  $MB$ ,  $\beta_8$ , is positive.

Tests of hypotheses 2 through 5 are equivalent to tests of the coefficients  $\beta_1$  to  $\beta_4$ . Under the null hypothesis, the coefficients are zero and distributed according to the  $t$ -distribution.

### Chapter 3 – Endnote

- <sup>1</sup> Cebenoyan, Papaioannou, and Travlos (1991) use the first calendar time the identity of the ultimate bidder (domestic or foreign) is disclosed. Cakici, Hessel, and Tandon (1990) choose the trading day before the *WSJ*'s publication date of the offer's initial announcement as the event date of each acquisition. Instead of a single announcement date, Harris and Ravenscraft (1991) use three announcement dates: 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. Therefore, Harris and Ravenscraft estimate cumulative abnormal returns based on multievent windows spanning all announcements.
- <sup>2</sup> Poulsen and Jarrell (1987) used this database. It includes not only tender offer between U.S. companies but also tender offers by foreign companies.
- <sup>3</sup> Brown and Warner (1985) comment that following the typical procedure, each excess return is standardized by its estimated standard deviation. This explicitly accounts for heteroscedasticity in the excess returns, and can also increase the power of the test.
- <sup>4</sup> Servaes and Zenner (1989) also presented the evidence that, when the foreign acquirers are not Anglo-Saxon (British, Canadian, Australian, or New Zealand), foreign acquirers pay significantly more, in the case of the acquisition of partial ownership interests.

## Chapter 4

### Empirical Results

Using the methodology discussed in the previous Chapter, the set of hypotheses stated in Chapter 2 are tested. In this chapter, we report and analyze the results of the tests of the hypotheses.

#### 4.1 The Valuation Effect of Foreign Takeovers

In this section, we test the “the valuation effect of foreign takeovers” hypothesis (Hypothesis 1). The test of Hypothesis 1 is simply to see if foreign acquirers pay significantly higher premiums than do domestic buyers, on average. That is, we investigate whether a wealth effect of foreign acquisitions still exists after controlling for the various factors which are known to have significant effects on the change in the stock price of the target firms in acquisition literature.

##### 4.1.1 Target Abnormal Returns of Foreign Takeover sample

Table 4-1 presents the daily average residuals,  $AR$ 's, and the cumulative abnormal residuals over the event period  $(-30, +5)$ ,  $CAR_{-30,t}$ , for the U.S. target firms of foreign takeover sample.

The average daily abnormal returns,  $AR$ 's, become significantly positive after  $t=-20$ , and they are significantly positive for 12 days of the pre-announcement period  $(-30, -1)$ . During the period  $(-8, +1)$ , the  $AR_t$ 's are all significantly positive at the 5% level (two-tailed test) except for  $t=-4$ .

Over the pre-announcement period, the daily average residual is no more than 1% until  $t=-6$ . At the announcement date,  $t=0$ , the shareholders of the U.S. target firms involved in foreign acquisitions earn an average abnormal returns of 22.65%,

which is highly significantly different from zero at the 1% level. A positive abnormal return,  $+AR$ , is earned by 92.31 percent of the sample target firms.

No significant positive market reaction is found after the public announcement except one day following announcement. This lag in adjustment at  $t=+1$  may be due to the fact that some public announcements are made after the market closes. Results support the semi-strong form efficient market hypothesis.<sup>1</sup>

Table 4-2 shows the cumulative abnormal residuals,  $CAR_{t_1, t_2}$ , for 5 different windows<sup>2</sup> for the U.S. target firms in the foreign takeover sample.

If we held the portfolio of the target stocks involved in foreign acquisitions during one-month interval  $(-22, +1)$ , the  $CAR$  would be about 37.23% with z-value equal to 37.10, which is significant at the 1% level. For an one-week window  $(-3, +1)$ , the  $CAR$  turns out to be 30.18% with z-value equal to 63.50, which is significant at the 1% level. During the 2-day announcement period  $(-1, 0)$ , target firm shareholders earn the cumulative abnormal returns of 26.39% with z-value 86.90, which is also significant at the 1% level.

In general, the evidence reported in Table 4-1 and 4-2 suggests that unanticipated foreign takeovers announcements lead to significant changes in common stock prices of the U.S. target firms. This result is consistent with the findings of the previous merger studies on price behavior of target stocks surrounding an acquisition announcement.

#### 4.1.2 Target Abnormal Returns of Domestic Takeover sample

Table 4-3 presents the daily average residuals,  $AR$ 's, and the cumulative abnormal residuals over the event period  $(-30, +5)$ ,  $CAR_{-30, t}$ , for the U.S. targets of domestic takeover sample.

The average daily abnormal returns,  $AR$ 's, become significantly positive after  $t=-30$ , and they are significantly positive for 16 days of the pre-announcement period  $(-30, -1)$ . Over the pre-announcement period, the daily average residual is no more than 1% until  $t=-2$  except for  $t=-15$ . At the announcement date,  $t=0$ , the shareholders of the U.S. target firms in domestic acquisitions earn an average

abnormal returns of 11.96%, which is highly significantly different from zero at the 1% level. A positive abnormal return,  $+AR$ , is earned by 72.12 percent of the sample target firms.

No significant positive market reaction is found after the public announcement except one day following announcement. Results of this sample also support the semi-strong form efficient market hypothesis.

Table 4-4 shows the cumulative abnormal residuals,  $CAR_{t_1, t_2}$ , for 5 different windows for the U.S. target firms in the domestic takeover sample.

If we held the portfolio of the target stocks involved in domestic acquisitions during one-month interval  $(-22, +1)$ , the  $CAR$  would be about 32.17% with  $z$ -value equal to 33.13, which is significant at the 1% level. For one-week window  $(-3, +1)$ , the  $CAR$  turns out to be 22.87% with  $z$ -value equal to 49.77, which is significant at the 1% level. During the 2-day announcement period  $(-1, 0)$ , target firm shareholders earn the cumulative abnormal returns of 20.47% with  $z$ -value 69.26, which is significant at the 1% level.

In general, these results are also consistent with the findings of the previous merger studies on price behavior of target stocks surrounding an acquisition announcement.

#### **4.1.3 Comparison of Target Abnormal Returns: Foreign vs Domestic**

After we control for the well-known effects of payment method, acquisitions type, and tax status of the bids, the comparison of the U.S. target abnormal returns between foreign and domestic takeover sample is expected to shed light on the existence of the valuation effect of foreign takeovers. Furthermore, since we construct the control sample (domestic takeover sample) in a way that the distribution of the control sample is consistent with that of the foreign takeover sample in terms of target firm size and time period of the bids, we can also eliminate the size and time-specific effects on target wealth gains.

Table 4-5 presents the results of the statistical comparison of  $CAR$ 's for the 5 different windows between foreign and domestic sample.

For the two-day announcement period  $(-1, 0)$ , the *CAR*'s for the foreign and domestic takeover sample are 26.39% and 20.47%, respectively. The difference of *CAR*'s between these two samples is 5.92%, which is significantly different from zero at the 1% level ( $z$ -value=12.75). Over the one-week window  $(-3, +1)$ , the *CAR* for the foreign sample is 30.18%, while it is 22.87% for the domestic sample. The difference of *CAR*'s between these two portfolios is 7.31% with  $z$ -value equal to 9.91, which is significant at the 1% level. In the short-term intervals, therefore, the target wealth gains of foreign takeover sample turn out to be higher than those of domestic takeover sample.

This result is also true of the long-term window *CAR*'s. Over the two-week window  $(-8, +1)$ , the target *CAR*'s for foreign and domestic sample are 33.37% and 25.65%, respectively. The difference is 7.72%, which is significantly different from zero at the 1% level. For one-month interval  $(-22, +1)$ , the *CAR* for foreign takeover sample is 37.23%, while it is 32.17% for the domestic sample. The difference is 5.06%, which is significant at the 1% level.

The "valuation effect of foreign acquisition" hypothesis (Hypothesis 1) predicts that foreign acquiring firms pay significantly higher premiums than do U.S. buyers, on average, because foreign acquirers might have extra sources of synergy resulting from various types of market imperfections in an international setting. The results shown in Table 4-5 are consistent with this prediction. Therefore, these findings provide strong evidence that the valuation effect of cash tender offers is significantly higher in foreign takeovers (37.23%) than in domestic takeovers (32.17%). These empirical results also confirm those of the recent studies by Harris and Ravenscraft (1991) and Cebenoyan, Papaioannou, and Travlos (1991). Both studies report that target wealth gains are significantly higher in cross-border takeovers than in domestic takeovers.

Table 4-6 presents the summary of *CAR*'s estimated by selected studies on the valuation effect of foreign and domestic takeovers.

It is very likely that most of previous studies shown in Table 4-6 might use the U.S. target firms involved both in cross-border and in pure domestic takeovers, as

samples. In Table 4-6, we define this type of takeover sample as “mixed” sample. Even though these figures may not be directly comparable, it is clear that target abnormal returns are higher in foreign takeovers than in either domestic or mixed takeover sample, as shown in Table 4-6. Thus this summary offers additional support to the view that target abnormal returns are significantly higher in foreign acquisitions than in domestic takeovers.

#### **4.2 Determinants of U.S. Target Premiums in Foreign Takeovers**

In the previous section, we tested the valuation effect of foreign takeovers (Hypothesis 1). The results of the test provide strong support to the hypothesis that foreign acquirers, on average, pay significantly higher premiums for U.S. target firms than do U.S. buyers. In this section, we investigate the determinants of higher wealth gains of U.S. target shareholders in foreign takeovers by using the cross-sectional regression analysis. Although a portion of disparity in the reported abnormal returns can be attributed to other firm-specific factors, we focus on those variables that are considered to explain the magnitude of U.S. target premiums in foreign acquisitions in the model of Chapter 2. That is, we test whether exchange rates, taxes, and intangible asset variables can explain the variation in the wealth effects of U.S. target shareholders, as predicted by the model. Furthermore, we also introduce three dummy variables for the home country of the foreign acquirers and one dummy variable for multiple-bidder contest in order to test the valuation effect of the nationality and competition among multiple bidders, respectively.

Table 4-7 reports the results of cross-sectional regression eq. (3.11). The regression equation is designed to test for the role of the hypothesized extra sources of synergy generated by foreign takeovers, such as the degree of deviation from PPP, double tax benefits for foreign acquisition debts, and intangible assets of foreign acquiring and U.S. target firms, in explaining the wide disparity in U.S. target abnormal returns.

Regressions (1) through (7) in Table 4-7 use an one-week window  $CAR(-3, +1)$  as the dependent variable. While regressions (1) through (4) represent single-factor

equations, regressions (5) and (6) represent the multiple-factor equations over the short-term interval  $CAR(-3, +1)$ . Regression (7) is a stepwise regression.

Regression (1) shows that the coefficient of  $DP$ , the degree of deviation from PPP, has the predicted positive sign, but is statistically insignificant at the 10% level (one-tailed test). This finding indicates that the exchange rate variable,  $DP$ , cannot explain the variation in short-term target abnormal returns. In this sense, the result of regression (1) doesn't seem to support the exchange rate argument (Hypothesis 2) that, unless a change in the exchange rate is followed by full adjustment of domestic and/or foreign prices to PPP, foreign acquirers gain positive arbitrage potential through takeovers and could pay higher target premiums to U.S. target shareholders than domestic buyers.

Regression (2) reveals that the coefficient of  $NTS$ , the net marginal tax savings from double tax deductions for foreign acquisition debts, is positive and statistically significant at the 5% level. It has also a relatively strong explanatory power since the  $F$ -statistic of regression (2) is 4.07, which is significant at the 5% level. This finding is consistent with Haas and Karls' (1989) argument that foreign acquirers may be able to get double tax deductions for acquisition-related interest expenses both in the U.S. and in their home countries through the creation of a third country subsidiary to finance the deal when tax treatment of such unit is favorable.

In regressions (3) and (4), the coefficients of  $ARD$  and  $TRD$ , R&D intensities of the foreign and U.S. target firm's industry, turn out to be negative and are not statistically significant at 10% level.<sup>3</sup> These results are not consistent with intangible asset arguments that the industry variables of foreign acquiring firms or U.S. target firms are related to the magnitude of U.S. target wealth gains in foreign acquisitions.

In order to see the interrelations among explanatory variables, we estimate the multiple regressions (5) and (6) in Table 4-7. Regression (5) includes three factors of  $DP$ ,  $NTS$ , and  $TRD$ , while regression (6) contains all four variables of  $DP$ ,  $NTS$ ,  $TRD$ , and  $ARD$ . In addition, regression (5) and (6) also include three dummy variables for the nationality of foreign acquirers and one dummy for multiple-bidder contests in order to control for the valuation effect of the nationality of foreign

acquirers and competition among multiple bidders, respectively. Using the dummy variable *MB*, we restrict our analysis of competition to a simple single/multiple-bidder classification instead of the number of bidders, because our multiple-bidder sample consists of 23 contests with two bidders and only 1 with three bidders. The other 80 tender offers are single-bidder cases.

The result of regression (5) shows that the coefficient of *NTS*, net marginal tax savings, remains significantly positive, and the dummy variable for multiple bids, *MB*, is also significantly positive at the 5% level (one-tailed test). But none of the other variables is statistically significant. This finding reinforces the results presented in single-factor regression analysis, and is consistent with the “double tax benefits” hypothesis (Hypothesis 3). This result also confirms previous empirical findings of a positive relation between target abnormal returns and competition among bidders [Bradley, Desai, and Kim (1988) and Franks, Harris, and Mayer (1988)] in an international context. That is, since foreign bidders compete with domestic bidding firms or other foreign bidders directly in the tender offer process, the net effect of multiple bids is to increase the wealth gains of U.S. target firms involved in foreign takeovers. This finding implies that a global market for corporate control is as competitive as a domestic market for corporate acquisition in the U.S.<sup>4</sup>

On the other hand, this result is inconsistent with PPP and intangible asset arguments, because none of *DP*, *ARD*, and *TRD* are significant at the conventional levels. This confirms the previous finding by Cebenoyan, Papaioannou, and Travlos (1991) that market reaction is not affected by the asset or industry specificity of the U.S. targets. It is also worthwhile to note that none of the three dummy variables to represent the nationality of foreign acquirers have significant coefficients in regression (5), which indicates that a short-term window *CAR*(-3, +1) doesn't capture the valuation effect of the nationality of the foreign acquirers.

Since it is very difficult to collect comprehensive data on the industry of foreign acquirers, the sample size of regression (6), which includes the industry variable of foreign acquirers, is relatively smaller (N=31). Regression (6) presents that only tax variable, *NTS*, is still significantly positive despite smaller sample. However,

none of the other variables have significantly positive coefficients in regression (6). Because of smaller sample, we must be cautious in interpreting the result of the regression (6).

In regression (7), we report the result of a stepwise regression procedure, using short-term window  $CAR(-3, +1)$  as the dependent variable. In this study, a significance level of 10% is utilized to either enter a variable into the model or delete a variable from the model. The tax variable,  $NTS$ , enters as the strongest explanatory variable at the exclusion of all others. The next variable to be chosen is  $EC$ , which is the dummy variable for an acquiring company in the EEC. It is worth noting that the coefficient of  $EC$  is negative. The third variable is the dummy variable for multiple-bidder contest,  $MB$ . No other variables meet the 10% significance level for the entry into the model. The stepwise procedure terminates with regression (7) that includes explanatory variables  $NTS$ ,  $EC$ , and  $MB$ .

To test whether the results presented in Table 4-7 are robust to the window length of the  $CAR$  for the U.S. target shareholders, we estimate regressions (1a) through (7a) in Table 4-8, using an one-month window  $CAR(-22, +1)$  as the dependent variable. As shown in Table 4-8, the results appear to be sensitive to the window length of the  $CAR$  for the U.S. target shareholders, but they turn out to be essentially robust.

Regression (1a) shows that the coefficient of  $DP$  is positive and statistically significant at the 10% level (one-tailed test), which is not the case in regression (1) in Table 4-7. This finding seems to support PPP argument that a foreign acquirer could gain positive arbitrage potential through takeovers of U.S. companies in case where a change in the U.S. dollar is followed by a partial or no adjustment of domestic and/or foreign prices to PPP.

Moreover, regression (2a) indicates that the coefficient of  $NTS$  is still positive, but is no longer statistically significant at the conventional levels. This finding is not consistent with the result of the previous regression (2) in Table 4-7.

The results of regressions (3a) and (4a) are similar to those previously reported in Table 4-7. The coefficients of  $ARD$  and  $TRD$  are still negative and insignificant at

the 10% level. The intangible asset arguments are not supported by the data. These findings confirm the previous results that the industry characteristics of foreign acquirers and U.S. target firms may not be a major determinant of the valuation effect of foreign takeovers.

In comparison to the results of regressions (1a) and (2a), the regression (5a) shows that the coefficient of *DP* is no longer significant but the coefficient of *NTS* becomes significantly positive at the 5% level when the effect of the nationality of a foreign acquirer is considered. The interrelation between *DP* and *JP*, dummy for Japanese companies, can explain this possibility (the correlation coefficient between *DP* and *JP* is about 0.4 and significantly different from zero at the 1% level). Because the coefficient of *DP* is no longer significant when the dummy variables to represent the nationality of foreign acquirers, *JP*, *EC*, and *CN*, are included in regression (5a).

In order to separate the effect of the violation of PPP from the nationality effect of Japanese acquirers, we run another single-factor regression (1a') using the subsample which consists of only non-Japanese acquiring firms. Regression (1a') shows that the coefficient of *DP* is no longer significant. This finding reinforces the argument that the significantly positive effect of *DP* in regression (1a) is attributable to the effect of the nationality of foreign acquirers.

These results of regressions (5a) and (1a') are consistent with those previously reported in Table 4-7, which imply that double tax benefit for foreign acquisition debts, *NTS*, only explains the cross-sectional variation in the U.S. target wealth gains. Therefore, these findings ensure that Haas and Karls' (1989) tax argument is robust regardless of the window length of *CARs* used as the dependent variable in the cross-sectional regression analysis.

Furthermore, regression (5a) shows that the coefficient of *JP*, the Japanese dummy variable, is significantly positive at the 10% level, but none of the other nationality dummy variables are significant. It presents the evidence that Japanese companies, on average, pay significantly higher abnormal returns to U.S. target shareholders than do non-Japanese companies.

However, when we use the one-week window  $CAR(-3, +1)$  as the dependent variable, as shown in Table 4-7, none of the three dummy variables for the home country of the foreign acquirers are significant. A plausible explanation for this inconsistency is that many sources of information on the nationality of a prospective acquirer are leaked to the market, and thus the nationality effect can already be reflected in the stock price of a potential U.S. target firm more than one week prior to the public announcement. Particularly important is the Schedule 13D requirement of the Williams Act, which directs acquirers of more than 5 percent of a firm's equity to file a Schedule 13D to report the acquisition within 10 days of crossing this threshold. In addition, street talk and newspaper stories speculating on future takeovers can also be important sources of information on the nationality of a foreign acquirer.<sup>5</sup> Thus, we can find the valuation effect of the nationality only in the long-term  $CAR(-22, +1)$ , but not in the short-term  $CAR(-3, +1)$ .

In comparison, the tax effect stemming from double tax deductions for foreign acquisition debts is significantly positive, regardless of the window length of  $CAR$ . The reason for this is that, unlike the nationality effect, tax effect is determined not only by the corporate income tax rate of its home country, but also by the acquisition financing method and the debt capacity of a foreign acquirer. Usually, the information regarding the sources of acquisition financing and the specific amount of debt financing is not revealed until the public announcement. That's why tax effect consistently appears in both long-term and short-term  $CAR$ 's, although the nationality effect disappears in short-term  $CAR$ .

In addition, regression (5a) indicates that the dummy variable for multiple-bidder contest,  $MB$ , has significantly positive coefficient at the 5% level, as does regression (5). This result reinforces previous empirical findings of a positive relation between target abnormal returns and competition among bidders in an international context. In the case of the long-term window  $CAR$ , the effect of multiple bids is still to increase the wealth gains of U.S. target firms involved in foreign takeovers.

With the smaller sample size like regression (6a), we must be very cautious in interpreting the result of regression (6a) properly. Nevertheless, the effect of

double tax deductions, *NTS*, remains significantly positive at the 10% level (one-tailed test), confirming the relation between double tax benefits and U.S. target wealth gains. The coefficient of multiple-bidder dummy, *MB*, is also significantly positive at the 10% level. However, the coefficient of *JP* is not significant at the conventional levels due to smaller sample size. While the coefficient of *DP* is still positive, it is no longer significant when the nationality effect is taken into account. Furthermore, neither *ARD* nor *TRD* have significant coefficients.

In regression (7a), we presents the result of a stepwise procedure, using a long-term window  $CAR(-22, +1)$  as the dependent variable. The significance level of an F-statistic is 10%. Unlike the previous stepwise regression (7), the dummy variable for multiple-bidder contest, *MB*, enters as the strongest explanatory variable. No other variables meet the cut-off point with an F-statistic significant at the 10% level.

In sum, our results of cross-sectional regression analysis as shown in Table 4-7 and Table 4-8, provide empirical evidence for the “double tax benefits” hypothesis (Hypothesis 3). These results offer strong support to Haas and Karls’ (1989) tax argument that it is possible to get double tax deductions for acquisition-related interest expenses incurred by foreign acquirers both in the U.S. and in their home countries, by creating a third country subsidiary to finance the deal when tax treatment of such unit is favorable.

Since the 1986 Tax Reform Act reduced the U.S. corporate income tax rates from 46 to 34 percent, it reduced the U.S. tax benefit of the interest deductions. While this has not done away with the tax subsidy to debt financing of acquisitions, it has affected the price which a domestic acquirer using leverage can offer for a U.S. company [Tillinghast (1990)]. In contrast, these results clearly indicate that, in the case of a foreign acquirer, a greater tax benefits may be obtainable if the interest is deductible in its home country.

However, neither PPP argument nor intangible asset arguments provide a satisfactory explanation for the wide variation in excess abnormal returns earned by U.S. target shareholders in foreign takeovers. Hence, these findings suggest that

differences in statutory tax rates across tax jurisdictions provide extra source of synergy for foreign acquirers, thereby encouraging foreign investors to bid for the U.S. companies. That is, tax variables are considered to be a good explanation for higher wealth gains of U.S. target shareholder in the cross-border takeovers, as predicted by the model.

Furthermore, we find that there exists a valuation effect of the nationality of foreign acquirers. It is very likely that the U.S. targets of Japanese acquirers have significantly higher wealth gains than do those of non-Japanese acquirers. The results also confirm previous empirical findings of a positive relation between target abnormal returns and competition among multiple bidders in an international context. That is, since foreign bidders often compete with domestic competitors or other foreign bidders directly in the tender offer process, the net effect of multiple bids is to increase the wealth gains of U.S. target firms involved in foreign takeovers. This finding implies that a global market for corporate control is as competitive as a domestic market for corporate acquisition in the U.S..<sup>6</sup>

## Chapter 4 – Endnote

- <sup>1</sup> Semi-strong form efficient markets are defined as markets in which all relevant publicly available information is fully reflected in security prices, so that nothing that will lead to profitable trades can be gained from public sources.
- <sup>2</sup> Even though we use 5 different window lengths of *CAR* in Table 4-2, we focus primarily on the following two windows: 1) an one-month window *CAR*(-22, +1), and 2) an one-week window *CAR*(-3, +1). According to Table 4-1, the average daily abnormal returns,  $AR_t$ , become significantly positive after  $t=-20$ . In order to capture these market reactions to the leakage of information or market speculation on future takeovers almost one month prior to the announcement date, we estimate an one-month window *CAR*(-22, +1). Furthermore, the daily abnormal return is no more than 1% until  $t=-3$  (except for  $t=-6$ ). From  $t=-3$ , price reactions to future tender offers become so strong that about 80% of total *CAR* earned during the event-period (-30, +5) was realized over days  $t=-3$  through  $t=+1$ . Hence, we also use this one-week window (-3, +1) in measuring *CAR*, in addition to the one-month window (-22, +1). The choice of the other 3 windows is arbitrary.
- <sup>3</sup> We also used R&D intensities based on the ratio of R&D expenses to sales. However, those measures of R&D intensity were not useful in explaining the higher target wealth effects in foreign takeovers, either. They even reduced the explanatory power of the regression equations.
- <sup>4</sup> Recent studies by Harris and Ravenscraft (1991) and Cebenoyan, Papaioannou, and Travlos (1991) also report that competition among bidding firms increases the abnormal returns to U.S. target shareholders in the foreign acquisitions of U.S. companies.
- <sup>5</sup> For reference of legitimate sources of information on prospective takeovers, see Poulsen and Jarrell (1987).
- <sup>6</sup> Moreover, we also test for the effect of real interest differentials between the U.S. and the home countries of foreign acquirers on the magnitude of U.S. target wealth gains. The finding indicates that the coefficient of the real interest differential is positive, but statistically insignificant at the conventional levels either in the single-factor regression or multiple regression. This finding is inconsistent with our prediction that real interest differentials between the U.S. and foreign countries could be one of the determinants of the higher wealth gains of U.S. target shareholders in foreign takeovers. For further discussion about this test, see Appendix.

## Chapter 5 Summary and Conclusion

This paper develops a simple model to explain the reasons for higher wealth gains of the U.S. target firms involved in foreign acquisitions. This paper also provides empirical work on 1) whether or not targets of foreign acquirers have significantly higher wealth gains than do targets of domestic buyers, and 2) if the hypothesized extra sources of synergy suggested by the model can explain the cross-sectional variation in the wealth gains of U.S. target shareholders in foreign takeovers.

In order to control for the wealth effects of payment method, acquisition type, and tax status of the bid, which are major findings in the acquisition literature in the 1980s, we limit our sample to foreign cash tender offers. For comparison with foreign takeover sample, we also construct domestic takeover sample as a control sample, using the same selection criteria applied to the foreign takeover sample. Furthermore, in order to eliminate the size and time-specific effects, we control for the size of the U.S. target firm and the time period of the bid in a way that the distribution of the control sample is consistent with that of the foreign takeover sample in terms of target-firm size and time period of the bid.

We show that target wealth gains are significantly higher in foreign takeovers (37%) than in domestic takeovers (32%). Since we control for the other value-creating factors in selection of the control sample as we mentioned earlier, the difference of 5% in target abnormal returns between foreign and domestic takeover sample can be attributed to the valuation effect of foreign takeovers. Thus our results offer additional support to the view that target wealth effects are significantly higher in foreign takeovers than in domestic takeovers.

Using the cross-sectional regression analysis, we investigate the determinants of the wealth gains of the U.S. target firms in the cross-border takeovers. As numerous studies in FDI literature suggested, we hypothesize that the following set of market

imperfections are the main sources of the valuation effects of foreign acquisitions: 1) deviation of exchange rate from PPP, 2) double tax deductions for foreign acquisition debts, and 3) specialized intangible assets owned by foreign acquirers or U.S. target firms.

The results of the cross-sectional regression analysis indicate that the effect of double tax deductions for foreign acquisition debts on U.S. target wealth gains is positive and statistically significant. This finding is consistent with Haas and Karls' (1989) argument that foreign acquirers may get double tax deductions for acquisition-related interest expenses both in the U.S. and in their home countries through the creation of a third country subsidiary to finance the deal when tax treatment of such units is favorable. That is, tax argument provides a good explanation for the variation in U.S. target abnormal returns in foreign cash tender offers.

Furthermore, we also find that there exists a valuation effect of the nationality of foreign acquirers. On average, Japanese companies pay significantly higher premiums than do non-Japanese acquirers. The results also present the evidence that competition among bidders increases the wealth gains of U.S. target firms involved in foreign takeovers. This finding implies that a global market for corporate control is as competitive as a domestic market for corporate acquisition in the U.S..

On the other hand, our results do not offer any support for PPP and intangible asset arguments. The exchange rate and industry variables (e.g., R&D intensities) of foreign acquiring firms and U.S. target firms do not explain the disparity in target wealth gains in foreign cash tender offers. Moreover, we also test for the effect of real interest differentials between the U.S. and the home countries of foreign acquirers on the magnitude of U.S. target wealth gains. The coefficient of the real interest differential is positive, but is statistically insignificant either in the single-factor regression or multiple regression.

In this study, we postulate that the target shareholders capture the majority of the synergistic gains from successful foreign takeovers, and the target wealth gains are a function of the factors which can create the synergistic gains. We do

not take into account the effect of foreign takeovers on the share prices of foreign acquiring firms. Even if one particular factor provides extra source of synergy through successful takeovers to foreign acquirers, it would not be necessary for them to pass along this benefit to U.S. target shareholders, unless foreign acquirers compete directly with other bidders. The proportion of this benefit captured by U.S. target shareholders might depend on the degree of competition among bidders and the relative bargaining-power of U.S. target managements.

In this sense, unless we have empirical evidence on the impact of foreign takeovers on the share price of foreign acquiring firms, we cannot complete the study on the valuation effect of cross-border takeovers. Therefore, we suggest that future research should include empirical work on the effect of cross-border takeovers on the change in share prices of foreign acquiring firms.

## **TABLES**

Table 1-1

Volume of Announced Domestic and Cross-border Acquisitions<sup>a</sup>, 1980-1989

YEAR	Domestic		Cross-border (U.S.)				All (U.S.) <sup>d</sup>			
	No.	Value <sup>e</sup>	Foreign <sup>b</sup>		U.S. <sup>c</sup>		Total		No.	Value
			No.	Value	No.	Value	No.	Value		
1980	1640	44.3	187	7.1	102	3.8	289	10.9	1929	55.2
1981	2094	82.6	234	18.8	101	1.1	335	19.9	2429	102.5
1982	2123	53.8	154	5.1	121	0.8	275	5.9	2398	59.7
1983	2313	73.1	125	5.9	146	2.5	271	8.4	2584	81.5
1984	2311	122.2	151	15.1	147	2.6	298	17.7	2609	139.9
1985	2715	179.8	197	10.9	175	1.4	372	12.3	3087	192.1
1986	2979	173.1	264	24.5	180	5.2	444	29.7	3423	202.8
1987	1728	163.7	220	40.4	142	11.0	362	51.4	2090	215.1
1988	1885	246.9	307	55.5	151	14.5	458	70.0	2343	316.9
1989	1965	221.1	285	40.0	220	22.2	505	62.2	2470	283.3
TOTAL	21753	1360.6	2124	223.3	1485	65.1	3609	288.4	25362	1649.0

<sup>a</sup>All statistics contained in this table reflect completed or pending acquisitions as of the end of the applicable period. Here, acquisition is defined as formal transfer of ownership of at least 10% of a company's assets or equity where the purchase price is at least \$1 MM.

<sup>b</sup>Foreign buyers include both foreign purchases of U.S. domestic companies and purchases of foreign-based subsidiaries of U.S. corporations.

<sup>c</sup>U.S. buyers refer to all sales of foreign companies and units of foreign companies to U.S. companies.

<sup>d</sup>All M&A means all M&A transactions involving U.S. corporations.

<sup>e</sup>Billion dollars of purchase price at current exchange rates.

Sources: Mergerstat Review (1989).

Table 3-1

**The Annual Distribution of Foreign Takeover Sample<sup>a</sup>  
Grouped by Nationality of the Acquiring Firm**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total (%)
UK	5	1	2	1	2	2	6	12	7	1	39 (37.5)
Canada	2		1	1	3		2		1	3	13 (12.5)
Japan				1	1		1	1	3	4	11 (10.6)
France		1			2		2	1	4	1	11 (10.6)
Netherlands			2		1		2	1			6 ( 5.8)
Germany							2		3		5 ( 4.8)
Australia		1		1		1		1		1	5 ( 4.8)
Switzerland					1			2	2		5 ( 4.8)
Sweden							2				2 ( 1.9)
Italy										2	2 ( 1.9)
Hong Kong			1					1			2 ( 1.9)
Belgium										1	1 ( 1.0)
Kuwait		1									1 ( 1.0)
Mexico										1	1 ( 1.0)
Total	7	4	6	4	10	3	17	19	20	14	104 (100.0)

<sup>a</sup>All transactions in this table reflect foreign cash tender offers.

Sources: Mergers and Acquisition, 1980-90, and Merger Yearbook, 1983-90.

Table 3-2

**All Foreign Acquisitions of U.S. Companies Grouped<sup>a</sup>  
by Nationality of the Acquiring Firm, 1980-1989**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total (X)
UK	50	80	54	41	48	78	89	78	114	69	701 (33.0)
Canada	57	62	36	28	36	25	64	28	37	50	423 (19.9)
Japan	9	9	4	6	6	9	16	15	35	53	162 (7.6)
France	20	14	12	7	7	4	6	19	25	17	131 (6.2)
Netherlands	6	8	5	7	5	17	9	9	9	14	89 (4.2)
Germany	14	14	6	2	4	12	19	15	29	18	133 (6.3)
Australia	2	7	2	6	5	10	12	17	10	12	83 (3.9)
Switzerland	7	6	7	7	7	10	6	9	15	8	82 (3.9)
Sweden	8	7	4	3	8	7	11	9	6	7	70 (3.3)
Italy	1	4	1	5	1	4	5	6	7	6	40 (1.9)
Hong Kong	2	2	4		1	1	3	3	3	4	23 (1.1)
Belgium					3	1	2		1	2	9 (0.4)
Kuwait	1	1	1	1	2						6 (0.3)
Mexico	1	2	3							2	8 (0.4)
others	9	18	15	12	18	19	22	12	16	23	164 (7.7)
<b>Total</b>	<b>187</b>	<b>234</b>	<b>154</b>	<b>125</b>	<b>151</b>	<b>197</b>	<b>264</b>	<b>220</b>	<b>307</b>	<b>285</b>	<b>2124 (100.0)</b>

<sup>a</sup>All transactions in this table reflect foreign acquisitions of ownership of at least 10% of U.S. company's assets or equity where the purchase price is at least \$1 MM.

Sources: Mergerstat Review, 1990.

**Table 3-3**

**The Annual Distribution of Foreign Takeover Sample<sup>a</sup>  
Grouped by the Size of U.S. Target Firm, 1980-89**

Size of Target <sup>b</sup>	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total (%)
\$1 MM-\$200 MM	5	1	3	2	5	2	6	4	7	7	42 (40.4)
\$200 MM-\$500 MM	1	1	3	2	2		5	7	4	3	28 (26.9)
\$500 MM-\$1 BIL	1	1			1	1	2	2	2	2	12 (11.5)
\$1 BIL-\$5 BIL		1			1		4	5	7	2	20 (19.2)
\$5 BIL-\$20 BIL					1			1			2 ( 1.9)
<b>Total</b>	<b>7</b>	<b>4</b>	<b>6</b>	<b>4</b>	<b>10</b>	<b>3</b>	<b>17</b>	<b>19</b>	<b>20</b>	<b>14</b>	<b>104 (100.0)</b>

<sup>a</sup>All transactions in this table reflect foreign cash tender offers.

<sup>b</sup>The size of the target is defined as the equity value of the target as of the announcement date.

Table 3-4

The Annual Distribution of Domestic Takeover Sample<sup>a</sup>  
 (Control Sample) Grouped by the Size of  
 U.S. Target Firms, 1980-1989.

Size of Target <sup>b</sup>	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	Total (%)
\$1 MM-\$200 MM	5	1	3	2	5	2	6	4	7	7	42 (40.4)
\$200 MM-\$500 MM	1	1	3	2	2		5	7	4	3	28 (26.9)
\$500 MM-\$1 BIL	0 <sup>c</sup>	1		1 <sup>c</sup>	1	1	2	2	2	2	12 (11.5)
\$1 BIL-\$5 BIL		1			1		4	5	7	2	20 (19.2)
\$5 BIL-\$20 BIL					1			1			2 ( 1.9)
Total	6	4	6	5	10	3	17	19	20	14	104 (100.0)

<sup>a</sup>All transactions in this table reflect U.S.-acquiring-U.S. cash tender offers.

<sup>b</sup>The size of the target is defined as the equity value of the target as of the announcement date.

<sup>c</sup>Only these two cells have different observations between foreign and domestic takeover sample. Compare this table with the previous one, Table 3-3.

**Table 3-5**

**Foreign Exchange Rates: National Currency  
Per the U.S. Dollar, 1980-1989**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
UK	0.419	0.524	0.619	0.689	0.865	0.692	0.678	0.534	0.553	0.601
Canada	1.195	1.186	1.229	1.244	1.321	1.397	1.380	1.300	1.193	1.198
Japan	203.0	219.9	235.0	232.2	251.1	200.5	159.1	123.5	125.9	138.4
France	4.516	5.748	6.725	8.347	9.592	7.561	6.455	5.340	6.059	6.315
Netherlands	2.129	2.468	2.624	3.064	3.549	2.272	2.192	1.777	1.999	2.105
Germany	1.959	2.255	2.376	2.724	3.148	2.461	1.941	1.581	1.780	1.866
Australia	0.847	0.887	1.020	1.109	1.208	1.469	1.504	1.384	1.169	1.329
Switzerland	1.763	1.798	1.994	2.179	2.585	2.076	1.623	1.278	1.504	1.608
Sweden	4.373	5.571	7.294	8.001	8.989	7.615	6.819	5.848	6.157	6.393
Italy	930.5	1200.0	1370.0	1659.5	1935.9	1678.5	1358.1	1169.2	1305.8	1344.5
Hong Kong	5.13	5.675	6.495	7.780	7.823	7.811	7.795	7.760	7.808	7.805
Belgium	31.52	38.46	46.92	55.64	63.08	50.36	40.41	33.15	37.35	39.08
Kuwait	0.271	0.281	0.289	0.293	0.304	0.289	0.292	0.270	0.283	0.294
Mexico	23.3	26.2	96.5	143.9	192.6	371.7	923.5	2209.7	2281.0	2491.0

Sources: United Nations, Monthly Bulletin of Statistics, 1980-1990

**Table 3-6**

**Corporate Income Tax Rates<sup>a</sup> of Major Industrialized Countries, 1980-1989**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
U.S.	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.34	0.34	0.34
UK	0.52	0.52	0.52	0.50	0.45	0.40	0.35	0.35	0.35	0.35
Canada	0.46	0.50	0.50	0.51	0.51	0.51	0.51	0.505	0.465	0.435
Japan	0.30	0.42 <sup>b</sup>	0.42	0.42	0.433	0.433	0.433	0.433	0.42	0.42
		(0.32) <sup>c</sup>	(0.32)	(0.32)	(0.333)	(0.333)	(0.333)	(0.333)	(0.33)	(0.32)
France	0.50	0.50	0.50	0.50	0.50	0.50	0.45	0.45	0.45	0.42
Netherlands	0.48	0.48	0.48	0.48	0.43	0.43	0.43	0.42	0.42	0.35
Germany	0.56 <sup>b</sup>	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
	(0.36) <sup>c</sup>	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)	(0.36)
Australia	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.49	0.49	0.39
Switzerland	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.098	0.098
Sweden	0.40	0.40	0.40	0.40	0.52	0.52	0.52	0.52	0.52	0.52
Italy	0.25	0.27	0.27	0.27	0.36	0.36	0.36	0.36	0.36	0.36
Hong Kong	0.17	0.165	0.165	0.165	0.185	0.185	0.185	0.185	0.18	0.17
Belgium	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.43	0.43	0.43
Kuwait	0.50	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
Mexico	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.35	0.35	0.35

<sup>a</sup>These rates are federal income taxes, not including local taxes.

<sup>b</sup>These are tax rates on undistributed incomes.

<sup>c</sup>The entries in the parentheses are tax rates on distributed incomes.

Sources: Price Waterhouse, Corporate Taxes: A Worldwide Summary, 1981-1990.

**Table 3-7**

**U.S. Withholding Tax Rates on Interest Payments  
to Foreign Investors, 1980-1989**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
UK	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Canada	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Japan	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
France	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Germany	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Australia	0.30	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Switzerland	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sweden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	0.30	0.30	0.30	0.30	0.30	0.30	0.15	0.15	0.15	0.15
Hong Kong	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Belgium	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Kuwait	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Mexico	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30

Sources: Price Waterhouse, Corporate Taxes: A Worldwide Summary, 1981-1990.

**Table 3-8**

**Annual Yields of Long-term Government Bonds  
Issued by Major Developed Countries**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
US	0.1139	0.1372	0.1292	0.1134	0.1252	0.1062	0.0768	0.0838	0.0885	0.0877
UK	0.1379	0.1474	0.1288	0.1080	0.1069	0.1062	0.0987	0.0947	0.0936	0.0964
Canada	0.1248	0.1522	0.1426	0.1179	0.1275	0.1104	0.0952	0.0995	0.1022	0.0988
Japan	0.0922	0.0866	0.0806	0.0742	0.0680	0.0634	0.0490	0.0421	0.0427	0.0499
France	0.1303	0.1579	0.1569	0.1363	0.1254	0.1094	0.0844	0.0943	0.0906	0.0877
Netherlands	0.1021	0.1155	0.1010	0.0861	0.0833	0.0734	0.0635	0.0638	0.0629	0.0721
Germany	0.0850	0.1040	0.0900	0.0790	0.0777	0.0687	0.0592	0.0584	0.0610	0.0697
Australia	0.1165	0.1396	0.1535	0.1433	0.1383	0.1410	0.1356	0.1347	0.1232	0.1353
Switzerland	0.0477	0.0557	0.0483	0.0451	0.0470	0.0478	0.0429	0.0412	0.0415	0.0520
Sweden	0.1174	0.1349	0.1304	0.1230	0.1228	0.1309	0.1026	0.1168	0.1135	0.1118
Italy	0.1611	0.2058	0.2090	0.1802	0.1495	0.1300	0.1052	0.0968	0.1016	0.1064
Belgium	0.1204	0.1371	0.1356	0.1186	0.1198	0.1061	0.0793	0.0782	0.0785	0.0835

Sources: United Nations, Monthly Bulletin of Statistics, 1980-1990

Table 4-1

**Average Residuals for Target Firms around Public  
Announcement: Foreign Takeover Sample**

Day	Average Residual(AR)		z-value for AR <sup>a</sup>		Positive AR	
	Daily	Cumulative	Daily	Cumulative	Percent	z-value
-30	-0.00272	-0.00272	-1.1728	-1.1728	36.54	-2.8437**
-29	0.00047	-0.00226	0.2720	-0.6370	44.23	-1.2748
-28	-0.00128	-0.00354	-0.1509	-0.6073	43.27	-1.4709
-27	0.00226	-0.00128	1.0342	-0.0063	49.51	-0.1971
-26	-0.00212	-0.00340	-0.3354	-0.1549	45.19	-1.0786
-25	0.00367	0.00027	0.4574	0.0444	46.15	-0.8825
-24	-0.00102	-0.00075	-0.6766	-0.2134	40.38	-2.0592*
-23	0.00293	0.00218	1.5130	0.3328	50.96	0.0981
-22	-0.00196	0.00022	-0.0412	0.3001	49.04	-0.2942
-21	0.00323	0.00345	1.4242	0.7329	57.69	1.4709
-20	0.00803	0.01147	3.7637**	1.8281	55.77	1.0786
-19	0.00726	0.01874	3.5395**	2.7671**	50.00	-0.0981
-18	-0.00175	0.01698	-0.0782	2.6370**	45.19	-1.0786
-17	0.00224	0.01922	2.3228*	3.1589**	48.08	-0.4903
-16	0.00441	0.02363	1.7830	3.5099**	50.00	-0.0981
-15	-0.00215	0.02148	-0.2235	3.3428**	48.08	-0.4903
-14	0.00753	0.02901	3.5313**	4.0953**	50.00	-0.0981
-13	0.00029	0.02930	1.0825	4.2339**	44.23	-1.2748
-12	-0.00197	0.02733	-0.2781	4.0575**	41.35	-1.8631
-11	0.00654	0.03386	1.9565	4.3901**	51.92	0.2942
-10	0.00606	0.03992	3.2679**	4.9940**	53.85	0.6864
-9	0.00085	0.04078	0.8775	5.0653**	50.00	-0.0981
-8	0.00479	0.04556	2.7383**	5.5222**	52.88	0.4903
-7	0.00539	0.05095	2.8834**	5.9917**	54.81	0.8825
-6	0.01110	0.06205	4.5263**	6.7715**	50.00	-0.0981
-5	0.00742	0.06948	3.9753**	7.4196**	52.43	0.3941
-4	0.00320	0.07267	1.4723	7.5643**	47.57	-0.5912
-3	0.01114	0.08382	5.7409**	8.5077**	55.77	1.0786
-2	0.01847	0.10228	9.1422**	10.0657**	60.78	2.0793*
-1	0.03738	0.13966	19.6155**	13.6453**	71.28	4.0225**
0	0.22654	0.36620	105.3259**	32.2493**	92.31	8.5310**
1	0.00827	0.37448	3.1431**	32.2970**	51.46	0.1971
2	0.00333	0.37781	1.6608	32.0916**	49.04	-0.2942
3	-0.00229	0.37552	-1.6388	31.3364**	45.19	-1.0786
4	0.00188	0.37740	0.9328	31.0424**	42.31	-1.6670
5	0.00007	0.37747	-0.3980	30.5422**	42.31	-1.6670

<sup>a</sup>Strictly speaking, these entries are z-statistics for standardized average residuals.

\*Significant at 5% level using two-tailed test.

\*\*Significant at 1% level using two-tailed test.

Table 4-2

Cumulative Average Residuals of Different Window Lengths: Foreign Takeover Sample

Window		CAR( $t_1, t_2$ )	ASCAR( $t_1, t_2$ ) <sup>a</sup>	z-value of ASCAR
Start( $t_1$ )	End( $t_2$ )			
-22	+1	0.37230	17.90919	37.1013**
-8	+1	0.33370	15.66094	50.0170**
-3	+1	0.30180	14.12909	63.5023**
-1	+1	0.27219	12.66093	73.0979**
-1	0	0.26392	12.35124	86.8987**

<sup>a</sup>ASCAR( $t_1, t_2$ ) means average standardized cumulative abnormal return defined as eq. (3.6).

\*Significant at 5% level using two-tailed test.

\*\*Significant at 1% level using two-tailed test.

Table 4-3

**Average Residuals for Target Firms around Public  
Announcement: Domestic Takeover Sample**

Day	Average Residual(AR)		z-value for AR <sup>a</sup>		Positive AR	
	Daily	Cumulative	Daily	Cumulative	Percent	z-value
-30	0.00764	0.00764	2.5973**	2.5973**	53.85	0.6864
-29	0.00293	0.01057	0.6270	2.2800*	47.12	-0.6864
-28	0.00393	0.01450	1.4896	2.7216**	51.92	0.2942
-27	0.00258	0.01708	1.0322	2.8731**	45.19	-1.0786
-26	0.00184	0.01892	0.9538	2.9963**	49.04	-0.2942
-25	0.00003	0.01895	0.4022	2.8994**	44.23	-1.2748
-24	0.01145	0.03040	6.2358**	5.0413**	57.69	1.4709
-23	0.00449	0.03489	2.9676**	5.7649**	51.92	0.2942
-22	0.00143	0.03632	0.8328	5.7128**	47.12	-0.6864
-21	0.00828	0.04460	4.2069**	6.7500**	48.08	-0.4903
-20	0.00062	0.04522	0.7006	6.6471**	45.19	-1.0786
-19	0.00041	0.04563	0.4979	6.5078**	45.19	-1.0786
-18	0.00287	0.04851	1.6379	6.7068**	51.92	0.2942
-17	0.00698	0.05549	3.8605**	7.4946**	51.92	0.2942
-16	0.00717	0.06266	4.3954**	8.3753**	54.81	0.8825
-15	0.01393	0.07659	6.8068**	9.8111**	50.96	0.0981
-14	-0.00366	0.07293	-1.2193	9.2224**	44.23	-1.2748
-13	0.00809	0.08102	3.5856**	9.8077**	63.46	2.6476**
-12	0.00700	0.08802	5.7428**	10.8636**	50.96	0.0981
-11	0.00343	0.09145	2.2952*	11.1018**	45.19	-1.0786
-10	0.00640	0.09785	3.1456**	11.5206**	44.23	-1.2748
-9	0.00226	0.10011	2.8439**	11.8621**	37.50	-2.6476**
-8	0.00455	0.10467	1.6105	11.9372**	46.15	-0.8825
-7	0.00577	0.11044	2.6447**	12.2257**	51.92	0.2942
-6	0.00355	0.11399	1.4251	12.2637**	49.04	-0.2942
-5	0.00619	0.12017	1.6837	12.2994**	50.96	0.0990
-4	0.00777	0.12794	4.0084**	12.8372**	59.62	1.8631
-3	0.00170	0.12964	1.3036	12.8510**	45.19	-1.0786
-2	0.01188	0.14152	5.5851**	13.6697**	58.82	1.6832
-1	0.08507	0.22659	41.8561**	21.3146**	71.13	4.0614**
0	0.11962	0.34622	56.5482**	31.0754**	72.12	4.4126**
1	0.01038	0.35660	5.5387**	31.5603**	48.08	-0.4903
2	-0.00193	0.35467	-1.4685	30.8241**	43.27	-1.4709
3	-0.00316	0.35151	-1.3008	30.1454**	43.27	-1.4709
4	0.00068	0.35219	0.3951	29.7781**	43.27	-1.4709
5	0.00006	0.35225	-0.1060	29.3440**	43.27	-1.4709

<sup>a</sup>Strictly speaking, these entries are z-statistics for standardized average residuals.

\*Significant at 5% level using two-tailed test.

\*\*Significant at 1% level using two-tailed test.

Table 4-4

Cumulative Average Residuals of Different Window Lengths: Domestic Takeover Sample

Window		CAR( $t_1, t_2$ )	ASCAR( $t_1, t_2$ ) <sup>a</sup>	z-value of ASCAR
Start( $t_1$ )	End( $t_2$ )			
-22	+1	0.32172	15.99244	33.1304**
-8	+1	0.25649	12.13556	38.7579**
-3	+1	0.22866	11.01880	49.7679**
-1	+1	0.21508	10.33796	59.9839**
-1	0	0.20470	9.79485	69.2601**

<sup>a</sup>ASCAR( $t_1, t_2$ ) means average standardized cumulative abnormal return defined as eq. (3.6).

\*Significant at 5% level using two-tailed test.

\*\*Significant at 1% level using two-tailed test.

**Table 4-5**

**Test on the Difference in CAR's between Foreign and Domestic Acquisition Sample**

Window		Comparison of CAR's between Foreign and Domestic Sample			
Start( $t_1$ )	End( $t_2$ )	Foreign(A)	Domestic(B)	Difference(A-B)	z-value <sup>a</sup>
-22	+1	0.37230	0.32172	0.05058	2.8078**
-8	+1	0.33370	0.25649	0.07721	7.9614**
-3	+1	0.30180	0.22866	0.07314	9.9090**
-1	+1	0.27219	0.21508	0.05711	9.5071**
-1	0	0.26392	0.20470	0.05922	12.7498**

<sup>a</sup>z-value of the difference in CAR's between foreign and domestic sample is estimated by eq. (3.10).

\*Significant at 5% level using one-tailed test.

\*\*Significant at 1% level using one-tailed test.

Table 4-6

Summary of CAR's for Target Shareholders Estimated by Selected Studies on the Valuation Effect of Takeovers

Study	Sample Period	CAR Window	Type of Sample		
			Foreign <sup>a</sup>	Domestic <sup>b</sup>	Mixed <sup>c</sup>
Our Study (1991)	1980-89	(-22, +1)	0.3723	0.3217	
		(-8, +1)	0.3337	0.2565	
Cebenoyan, Papaioannou, and Travlos (1991)	1978-87	(-5, +5)	0.2866	0.2241	
Harris and Ravenscraft (1991)	1970-87	(-20, +4)	0.3977	0.2633	
Cekici, Hessel, and Tandon (1990)	1982-87	(-20, +1)	0.2129		
Mergerstat Review (1989)	1980-89		0.4510 <sup>d</sup>		0.4170 <sup>d</sup>
Huang and Walkling (1987)	1977-82	(-1, 0)			0.2750
Jensen and Ruback (1983)					0.2909 <sup>e</sup>
Bradley, Desai, and Kim (1982)	1962-80	(-10, +10)			0.3180
Jarrell and Bradley (1980)	1962-77	(-40, +20)			0.3406
Bradley (1980)	1962-77	(-20, +20)			0.3218

<sup>a</sup>Foreign sample is defined as a sample which consists of U.S. target firms acquired by foreign buyers.

<sup>b</sup>Domestic sample is defined as a sample which consists of U.S. target firms acquired by U.S. buyers.

<sup>c</sup>Mixed sample is defined as a sample which consists of U.S. target firms in both cross-border and domestic takeovers.

<sup>d</sup>Target premiums reported in Mergerstat Review (1989) are not abnormal returns. They are defined as percentage that the price paid exceeds the market price of the target firm before offer.

<sup>e</sup>This figure is weighted average abnormal returns of various studies on the target wealth gains of tender offers.

Table 4-7

**Results of the Cross-sectional Regression Analysis  
(Dependent Variable: CAR<sub>-3, +1</sub>)**

The following regressions (1) through (7) use an one-week window CAR (-3, +1) as the dependent variable. The figures shown in parentheses are t-statistics of 8 coefficients except that the entries in parentheses of stepwise regression (7) are F-statistics of contributing variables. The total number of observations is 104 foreign takeovers.

Regressions	(1)	(2)	(3)	(4)	(5)	(6)	(7)
intercept	0.3011 (13.39)**	0.1994 (3.74)**	0.3001 (5.20)**	0.3098 (9.58)**	0.0603 (0.46)	-0.3813 (-1.27)	0.1796
DP	0.0589 (0.62)				-0.1346 (-1.13)	-0.2636 (-1.05)	
NTS		2.7025 (2.02)**			6.5649 (3.59)**	16.912 (3.29)**	5.0771 (12.05)**
ARD			-0.0030 (-0.04)			0.0320 (0.36)	
TRD				-0.0127 (-0.32)	0.0216 (0.56)	0.0657 (1.16)	
EC					-0.0945 (-0.98)	-0.1267 (-0.56)	-0.1267 (6.19)**
CN					0.0480 (0.43)	0.1169 (0.51)	
JP					0.1681 (1.11)	0.4934 (1.59)	
MB					0.1306 (2.22)**	0.1277 (0.99)	0.1234 (4.95)**
N	92	92	31	74	74	31	74
R <sup>2</sup>	0.004	0.043	0.001	0.001	0.235	0.417	0.208
F	0.384	4.070**	0.002	0.099	2.899**	1.964	6.130**

**Variable Definitions**

- DP = Degree of deviation of exchange rates from PPP.
- NTS = Net tax savings from double tax deductions for additional \$1 foreign acquisition debts.
- ARD = R&D intensity of foreign acquiring firm's industry (R&D expenses as a fraction of capital expenditures).
- TRD = R&D intensity of U.S. target firm's industry (R&D expenses as a fraction of capital expenditures).
- EC = Dummy variable for an acquiring firm in the European Economic Community, which is equal to one if its home country is a member of EEC, and zero otherwise.
- CN = Dummy variable for a Canadian acquirer, which is equal to one if the acquirer is Canadian, and zero otherwise.
- JP = Dummy variable for a Japanese acquirer, which is equal to one if the acquirer is Japanese, and zero otherwise.
- MB = Dummy variable for multiple-bidder contest, which is equal to one if the offer is made in a multiple-bidder contest, and zero otherwise.
- N = Number of observations

\*Significant at 10% level using one-tailed test.  
\*\*Significant at 5% level using one-tailed test.

Table 4-8

**Results of the Cross-sectional Regression Analysis  
(Dependent Variable: CAR<sub>-22, +1</sub>)**

The following regressions (1a) through (7a) use an one-month window CAR (-22, +1) as the dependent variable. The figures shown in parentheses are t-statistics of 8 coefficients except that the entries in parentheses of stepwise regression (7a) are F-statistics of contributing variables. The total number of observations is 104 foreign takeovers.

Regressions	(1a)	(1a')	(2a)	(3a)	(4a)	(5a)	(6a)	(7a)
Intercept	0.3728 (15.66)**	0.3655 (12.59)**	0.3457 (5.99)**	0.3776 (6.16)**	0.4151 (12.01)**	0.1397 (0.96)	-0.0845 (-0.24)	0.3294
DP	0.1864 (1.91)*	0.1005 (0.80)				0.0095 (0.71)	0.0328 (0.12)	
NTS			0.4912 (0.34)			4.4139 (2.16)**	11.801 (1.98)*	
ARD				-0.0201 (-0.26)			0.0072 (0.08)	
TRD					-0.0623 (-1.51)	-0.0573 (-1.32)	-0.0290 (-0.44)	
EC						0.0416 (0.39)	-0.0010 (-0.01)	
CN						0.0549 (0.44)	0.0417 (0.16)	
JP						0.2931 (1.73)*	0.4990 (1.41)	
MB						0.2458 (3.74)**	0.2652 (1.84)*	0.2666 (17.60)**
N	92	81	92	31	74	74	31	74
R <sup>2</sup>	0.039	0.008	0.001	0.002	0.031	0.301	0.375	0.208
F	3.638**	0.634	0.118	0.065	2.287	4.068**	1.651	6.130**

**Variable Definitions**

- DP = Degree of deviation of exchange rates from PPP.
- NTS = Net tax savings from double tax deductions for additional \$1 foreign acquisition debts.
- ARD = R&D intensity of foreign acquiring firm's industry (R&D expenses as a fraction of capital expenditures).
- TRD = R&D intensity of U.S. target firm's industry (R&D expenses as a fraction of capital expenditures).
- EC = Dummy variable for an acquiring firm in the European Economic Community, which is equal to one if its home country is a member of EEC, and zero otherwise.
- CN = Dummy variable for a Canadian acquirer, which is equal to one if the acquirer is Canadian, and zero otherwise.
- JP = Dummy variable for a Japanese acquirer, which is equal to one if the acquirer is Japanese, and zero otherwise.
- MB = Dummy variable for multiple-bidder contest, which is equal to one if the offer is made in a multiple-bidder contest, and zero otherwise.
- N = Number of observations

\*Significant at 10% level using one-tailed test.

\*\*Significant at 5% level using one-tailed test.

## APPENDIX

### The Effect of Real Interest Differentials

The objective of this appendix is to test for the effect of real interest differentials between the U.S. and the home countries of foreign acquirers on the target wealth effect of foreign takeovers. Based on eq. (2.23) in section 2.1, we hypothesize that the wealth gains of U.S. target shareholders involved in foreign takeovers are positively related to the real interest differentials between the U.S. and the home countries of foreign acquirers. To this end, we present the evidence that the abnormal returns earned by U.S. target shareholders cannot be explained by the real interest differentials.

#### A.1 Methodology and Data

In order to test for the effect of real interest differentials, we run the following cross-sectional regression model:

$$\begin{aligned} CAR_j = & \beta_0 + \beta_1 RD_j + \beta_2 DP_j + \beta_3 NTS_j + \beta_4 TRD_j \\ & + \beta_5 EC_j + \beta_6 CN_j + \beta_7 JP_j + \beta_8 MB_j + \epsilon_j \end{aligned} \quad (A.1)$$

The explanatory variable to represent the real interest differential,  $RD_j$ , in eq. (A.1) is defined as follows:

$RD$  = the real interest differential between the U.S. and the home country of a foreign acquirer, that is,  $(r - \pi) - (r^* - \pi^*)$ .

where

$r$  = the realized nominal interest rate of the U.S.,

$\pi$  = the realized inflation rate of the U.S.,

$r^*$  = the realized nominal interest rate of a foreign country,

$\pi^*$  = the realized inflation rate of a foreign country.

Practically, there is no unique real interest rate of each country. The magnitude of a real interest rate depends not only on the risk characteristics of the security being studied, but also on the price index used to calculate real returns [Mishkin (1984)]. In this appendix, we use the annual yield of long-term government bond as the nominal interest rate because it includes no risk premium and represents well a nation's marginal productivity of capital. Consumer price index (CPI) is used as a price index.

We collect the data on the domestic and foreign nominal interest rates and changes in CPI from *International Financial Statistics*. During the sample periods, 1980-89, the real interest rates of major developed countries are given in Table A-1.

## A.2 Empirical Results

Table A-2 reports the results of the cross-sectional regression analysis. While regressions (A) through (C) use an one-week window  $CAR(-3, +1)$  as the dependent variable, regressions (A1) through (C1) use an one-month window  $CAR(-22, +1)$  as the dependent variable in order to see the sensitivity of the results with respect to the window length of  $CAR$ .

All regressions (A) through (C1) in Table A-2 show that the coefficient of  $RD$ , the real interest differential, has the predicted positive sign, but is statistically insignificant at the conventional levels. This finding suggests that the real interest differentials between the U.S. and the home countries of foreign acquirers cannot explain well the magnitude of the wealth gains of U.S. shareholders involved in foreign acquisitions.

Regression (B) presents that the tax variable,  $NTS$ , and the dummy variable for multiple-bidder contest,  $MB$ , are positively significant, as does regression (5) in Table 4-7 which doesn't include  $RD$  as an independent variable. It is also observed that the real interest differential,  $RD$ , is strongly correlated with  $DP$  and  $NTS$ . Because of the multicollinearities which exist among  $RD$ ,  $DP$ , and  $NTS$ , the inclusion of  $RD$  in regression (B) leads to significant decrease in the explanatory power of the model, and the F-statistic of regression (B) is not statistically significant. It is

worth noting that those three variables are linked to each other through the U.S. and foreign nominal interest rates.

In regression (B1), *JP* and *MB* are positively significant. Unlike regression (5a) in Table 4-8 which doesn't include *RD* as an explanatory variable, the tax variable, *NTS* is not statistically significant due to the multicollinearity between *RD* and *NTS*. This result contrasts strongly with the finding of regression (5a) in Table 4-8.

In sum, we conclude that the wealth gains of U.S. target shareholders involved in foreign tender offers are unrelated to the real interest differentials between the U.S. and the home countries of foreign acquirers.

**Table A-1****The Real Interest Rates of Long-term Government Bonds  
Issued by Major Developed Countries**

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
US	-0.021	0.033	0.067	0.081	0.082	0.070	0.058	0.047	0.049	0.040
UK	-0.042	0.028	0.043	0.062	0.056	0.045	0.065	0.054	0.045	0.018
Canada	0.023	0.028	0.035	0.060	0.085	0.070	0.053	0.056	0.062	0.049
Japan	0.012	0.038	0.055	0.056	0.045	0.043	0.043	0.041	0.036	0.027
France	-0.008	0.024	0.039	0.040	0.051	0.051	0.059	0.061	0.064	0.053
Netherlands	0.037	0.049	0.042	0.058	0.050	0.051	0.062	0.071	0.056	0.061
Germany	0.031	0.041	0.037	0.046	0.054	0.047	0.061	0.056	0.048	0.042
Australia	0.016	0.043	0.043	0.042	0.098	0.074	0.045	0.050	0.051	0.059
Switzerland	0.008	-0.009	-0.009	0.015	0.018	0.014	0.035	0.027	0.023	0.020
Sweden	-0.020	0.014	0.044	0.034	0.043	0.057	0.061	0.075	0.056	0.048
Italy	-0.051	0.028	0.044	0.033	0.042	0.038	0.046	0.050	0.052	0.044
Belgium	0.054	0.061	0.049	0.042	0.057	0.057	0.066	0.062	0.067	0.053

Sources: United Nations, Monthly Bulletin of Statistics, 1980-1990.  
International Monetary Fund, International Financial Statistics, 1980-1990.

**Table A-2**

**Results of the Cross-sectional Regression Analysis  
On the Effect of Real Interest Differentials**

The figures shown in parentheses are t-statistics of  $\beta$  coefficients except that the entries in parentheses of stepwise regressions (C) and (C1) are F-statistics of contributing variables. The total number of observations is 104 foreign takeovers.

Regressions	(A)	(B)	(C)	(A1)	(B1)	(C1)
Dependent Variable	CAR(-3,+1)	CAR(-3,+1)	CAR(-3,+1)	CAR(-22,+1)	CAR(-22,+1)	CAR(-22,+1)
Intercept	0.2890 (13.33)**	0.0575 (0.42)	0.1934	0.3640 (13.85)**	0.1348 (0.89)	0.3248
RD <sup>a</sup>	0.7674 (0.73)	1.0545 (0.89)		0.5227 (0.41)	0.2585 (0.19)	
DP		-0.1405 (-1.036)			-0.0016 (-0.01)	
NTS		6.3204 (2.54)**	4.4521 (5.99)**		4.6143 (1.65)	
TRD		0.0233 (0.59)			-0.0569 (-1.29)	
EC		-0.0869 (-0.80)	-0.1159 (4.55)**		0.0363 (0.30)	
CN		0.0703 (0.58)			0.0546 (0.40)	
JP		0.1573 (1.01)			0.2940 (1.69)*	
MB		0.1297 (2.16)**	0.1220 (4.79)**		0.2466 (3.67)**	0.2712 (18.25)**
N <sub>2</sub>	91	73	73	91	73	73
R <sup>2</sup>	0.006	0.176	0.140	0.002	0.295	0.205
F	0.536	1.708	3.750**	0.169	3.351**	18.25**

<sup>a</sup>Rd means the real interest differential between the U.S. and the home country of a foreign acquirer. For the definitions of the other variables, see the note of Table 4-7 or 4-8.

\*Significant at 10% level using one-tailed test.

\*\*Significant at 5% level using one-tailed test.

## BIBLIOGRAPHY

- Adler, M. and B. Dumas, "International Portfolio Choice and Corporate Finance: A Synthesis," *Journal of Finance*, June 1983, 925-976.
- Adler, M. and B. Dumas, "Optimal International Acquisitions," *Journal of Finance*, March 1975, 1-19.
- Agmon, T. and D. R. Lessard, "Investor Recognition of Corporate International Diversification," *Journal of Finance* 32, September 1977, 1049-55.
- Agrawal, A. and H. Eytan, "The Tax Classification of Corporate Acquisition: Analysis and Evidence," *Working Paper*, Baruch College, CUNY, February 1989.
- Aliber, R., "A Theory of Direct Foreign Investment" in *The International Corporation: A Symposium*, C. Kindleberger (ed.), Cambridge, Mass.: M.I.T. Press, 1970, 17-34.
- Asquith, P. and E. Kim, "The Impact of Merger Bids on the Participating Firms' Security Holders," *Journal of Finance* 37, 1982, 1209-1228.
- BenDaniel, D. and A. Rosenbloom, *The Handbook of International Mergers and Acquisitions*, Prentice Hall, Englewood Cliffs, NJ, 1990.
- Bradley, M., A. Desai, and E. H. Kim, "The Rationale Behind Interfirm Tender Offers," *Journal of Financial Economics* 8, April 1983, 183-206.
- Bradley, M., A. Desai, and E. H. Kim, "Synergistic Gains from Corporate Acquisitions and Their Division between the Stockholders of Target and Acquiring Firms," *Journal of Financial Economics* 21, 1988, 3-40.
- Brown, S. and J. Warner, "Measuring Security Price Performance," *Journal of Financial Economics* 8, September 1980, 205-258.
- Brown, S. and J. Warner, "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics* 14, March 1985, 3-31.
- Cakici, N., C. Hessel and K. Tandon, "Foreign Acquisitions in the United States and the Effect on Shareholder Wealth," *Journal of International Financial Management and Accounting*, forthcoming, November 1990.
- Caves, R., *Multinational Enterprise and Economic Analysis*, Cambridge, MA: Cambridge University Press, 1982.
- Caves, R. and S. Mehra, "Entry of Foreign Multinationals into U.S. Manufacturing Industries" in *Competition in Global Industries*, M. Porter (ed.), Boston, Mass.: Harvard Business School Press, 1986, 449-481.

- Cebenoyan, S., G. Papaioannou and N. Travlos, "Foreign Acquisitions of U.S. Firms and Shareholder Wealth Effects," *Working Paper*, February 1991.
- Chicago Mercantile Exchange, *Statistical Yearbook: Futures*, 1980-1989.
- Chicago Mercantile Exchange, *International Monetary Market Yearbook*, 1983.
- Chwalek, C., "Creative Detective Work in Acquiring Overseas Firms," *Mergers and Acquisitions*, January/February 1990, 65-69.
- Cooke, T., *International Mergers and Acquisitions*, Basil Blackwell Inc., New York, NY, 1988.
- Cumby, R. and M. Obstfeld, "International Interest Rate and Price Level Linkages Under Flexible Exchange Rates: A Review of Recent Evidence" in *Exchange Rate Theory and Practice*, J. Bilson and R. Marston (eds.), Chicago: University of Chicago Press, 1984, 121-152.
- Dodd, P. and R. Ruback, "Tender Offers and Shareholder Returns: An Empirical Analysis," *Journal of Financial Economics* 5, April 1983, 105-137.
- Dodd, P. and J. Warner, "On Corporate Governance: A Study of Proxy Contests," *Journal of Financial Economics* 11, 1983, 401-438.
- Doukas, J. and N. Travlos, "The Effect of Corporate Multinationalism on Shareholders' Wealth: Evidence from International Acquisitions," *Journal of Finance* 43, December 1988, 1161-75.
- Dunning, J. and A. Rugman, "The Influence of Hymer's Dissertation on the Theory of Foreign Direct Investment," *American Economic Review*, May 1985, 228-232.
- Errunza, V. and L. Senbet, "The Effects of International Operations on the Market Value of the Firm: Theory and Evidence," *Journal of Finance*, May 1981, 401-418.
- Europe's 15,000 Largest Companies, 1987.
- Fama, E. and A. Farber, "Money, Bonds and Foreign Exchange," *American Economic Review* 69, 1979, 639-649.
- Farnsworth C., "Proposals on Foreign Investors," *The New York Times*, July 23, 1990.
- Frankel, J., "International Capital Mobility and Crowding Out in the U.S. Economy: Imperfect Integration of Financial Markets or of Goods Markets?" *NBER Working Paper* 1773, December 1985.
- Gailliot, H., "PPP as an Explanation of Long-Term Changes in Exchange Rates," *Journal of Money, Credit, and Banking*, August 1970, 348-357.
- Gilson, R., M. Scholes, and M. Wolfson, "Taxation and the Dynamics of Corporate Control: The Uncertain Case for Tax Motivated Acquisitions," in *Knights, Raiders, and Targets: The Impact of the Hostile Takeover*, J. Coffee, Jr., L. Lowenstein and S. Rose-Ackerman (eds.), Oxford University Press, New York, NY, 1988, 271-299.

- Gruer, F., R. Litzenger and R. Stehle, "Sharing Rules and Equilibrium in an International Capital Market under Uncertainty," *Journal of Financial Economics* 3, 1976, 233-256.
- Haas, R. and J. Karls, "How Foreign Buyers Can Get Double Tax Deductions," *Mergers and Acquisitions*, July/August 1989, 70-73.
- Halpern, P., "Corporate Acquisitions: A Theory of Special Cases? A Review of Event Studies Applied to Acquisitions," *Journal of Finance* 38, May 1983, 297-317.
- Harris, R. and D. Ravenscraft, "The Role of Acquisitions in Foreign Direct Investment: Evidence from the U.S. Stock Market," *Journal of Finance* 46, July 1991, 825-844.
- Hyan, C., "Tax Attributes as Determinants of Shareholder Gains in Corporate Acquisitions," *Journal of Financial Economics* 23, 1989, 121-153.
- Hymer, S., "The International Operations of National Firms: A Study of Direct Foreign Investment," *Doctoral Dissertation*, M.I.T., 1960.
- International Directory of Company Histories, St. James Press, 1989.
- Isard, F., "Lessons from Empirical Models of Exchange Rates," *Staff Papers*, International Monetary Fund (Washington), 1987, 1-27.
- Jarrell, G., J. Brickley and J. Netter, "The Market for Corporate Control: Empirical Evidence Since 1980," *Journal of Economic Perspectives* 2, Winter 1988, 49-68.
- Jarrell, G. and A. Poulsen, "Bidder Returns," *Working Paper*, 1987.
- Jensen, M. and R. Ruback, "The Market for Corporate Control: The Scientific Evidence," *Journal of Financial Economics* 11, April 1983, 5-50.
- Khoury, S., *Transnational Mergers and Acquisitions in the United States*, D.C. Heath and Company, Lexington, Mass., 1980.
- Kim, W.S. and S. Thomadakis, "The Distribution of Foreign Direct Investment in U.S. Manufacturing," *Working Paper*, Baruch College, 1988.
- Kindleberger, C., *American Business Abroad: Six Lectures on Direct Investment*, New Haven and London: Yale University Press, 1969.
- Kogut, B., "Foreign Direct Investment as a Sequential Process," In *The Multinational Corporation in the 1980s*, C. Kindleberger and D. Andretsch (eds.), Cambridge, MA: The MIT Press, 1983, 38-56.
- Kohlhagen, S., "Exchange Rate Changes, Profitability, and Direct Foreign Investment," *Southern Economic Journal*, 1977, 43-52.
- Lall, S. and N. Siddarthan, "The Monopolistic Advantages of Multinationals: Lessons from Foreign Investment in the U.S.," *The Economic Journal*, September 1982, 668-683.

- Levich, R., "Evaluating the Performance of the Forecasters," in *The Management of Foreign Exchange Risk*, R. Ensor (ed.), Euromoney Publications, 1982, 121-134.
- Link, A., "Acquisitions as Sources of Technological Innovation," *Mergers and Acquisitions*, November/December 1988, 36-39.
- Major Companies of Europe, Graham & Trotman, 1987.
- Merger Yearbook: Domestic, Securities Data Companies, 1983-1989.
- Mergers & Acquisitions, 1980-1989.
- MergerStat Review, Merrill Lynch Business Brokerage & Valuation, Various Issues.
- Mishkin, F., "Are Real Interest Rates Equal Across Countries? An Empirical Investigation of International Parity Conditions," *Journal of Finance* 39, December 1984, 1345-1357.
- Moody's International Manual, 1980-1990.
- Poulsen, A. and G. Jarrell, "Stock Trading before the Announcement of Tender Offers: Insider Trading or Market Anticipation?" *Office of the Chief Economist, SEC*, February 1987.
- Price Waterhouse, *Corporate Taxes: A Worldwide Summary*, New York: Price Waterhouse, 1981-1990.
- Rao, S., "The Impact of Changes in the Value of Selected Foreign Currencies Relative to the U.S. Dollar on Merger and Acquisition Activities of Foreign Companies in the United States," *Doctoral Dissertation*, Mississippi State University, 1988.
- Roll, R., "Violations of Purchasing Power Parity and Their Implications for Efficient Commodity Markets," in *International Finance and Trade*, vol. 1, Marshall Sarnat and Giorgio P. Szegö (eds.), Cambridge, Mass.: Ballinger, 1979, 133-176.
- Roll, R., "The Hubris Hypothesis of Corporate Takeovers," *Journal of Business* 59, 1986, 197-216.
- Scholes, M. and M. Wolfson, "The Effects of Changes in Tax Laws on Corporate Reorganization Activity," *Journal of Business* 63, 1990, S141-S164.
- Scholes, M. and M. Wolfson, *Taxes and Business Strategy: A Planning Approach*, Prentice Hall, Englewood Cliffs, NJ, 1992.
- Servaes, H. and M. Zenner, "An Empirical Analysis of Foreign Acquisitions in the U.S.," *Working Paper*, University of Chicago, November 1989.
- Shapiro, A., *Multinational Financial Management*, Allyn and Bacon, Needham Heights, Mass., 1989.
- Spiegel, D. and A. Berg, "The National Security Test for Foreign Acquisitions," *Mergers and Acquisitions*, November/December 1989, 32-37.

- Stulz, R., "A Model of International Asset Pricing," *Journal of Financial Economics* 9, December 1981, 383-406.
- Summers, R. and A. Heston, "A New Set of International Comparisons of Real Product and Price Levels Estimates for 130 Countries, 1950-1985," *Review of Income and Wealth*, March 1985, 1-25.
- Thomadakis, Stavros and N. Usmen, "International Market Segmentation and the Corporate Borrowing Decision," *Financial Management*, Forthcoming, 1992.
- Tillinghast, D., "Tax Considerations in Acquiring U.S. Enterprises," in *The Handbook of International Mergers and Acquisitions*, D. Bendaniel and A. Rosenbloom (eds.), Prentice Hall, Englewood Cliffs, NJ, 1990, 197-207.
- Travlos, N., "Corporate Takeover Bids, Method of Payment and Bidding Firm's Returns," *Journal of Finance* 42, 1987, 943-963.
- United Nations, *Monthly Bulletin of Statistics*, 1980-1989.
- Weston, J., K. S. Chung and S. Hoag, *Mergers, Restructuring, and Corporate Control*, Prentice Hall, Englewood Cliffs, NJ, 1990.
- Zejan, M., "New Ventures or Acquisitions. The Choice of Swedish Multinational Enterprises," *Journal of International Economics* 38, March 1990, 349-355.