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TAX EFFECTS ON FOREIGN DIRECT INVESTMENT IN THE U.S.:  
EVIDENCE FROM A CROSS-COUNTRY COMPARISON

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ABSTRACT

This paper investigates how the tax system of the U.S. and the capital-exporting country combine to affect the flow of foreign direct investment (FDI) into the U.S. First, using aggregate data, it corroborates earlier work suggesting that the U.S. effective tax rate does influence the amount of FDI financed by transfers of funds, but not the amount financed by retained earnings. The data are then disaggregated by major capital-exporting countries to see if, as theory would suggest, FDI from countries which exempt foreign-source income from taxation is more sensitive to U.S. tax rates than FDI from countries which attempt to tax foreign-source income. The data analysis does not reveal a clear differential responsiveness between these two groups of countries, suggesting either difficulties in accurately measuring effective tax rates or the availability of financial strategies which render the home country tax system immaterial in affecting the return on FDI.

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## 1. Introduction

The magnitude and financing of foreign direct investment in the U.S., which totalled more than \$40 billion in 1987, is potentially influenced by the tax systems of both the U.S. and the investor's country. Nevertheless, all recent studies of foreign direct investment (henceforth FDI) in the U.S. have investigated only the impact of U.S. taxation. The home country's tax system has been ignored either because the appropriate data is unavailable or, on theoretical grounds, it is deemed to be irrelevant to FDI.

This paper investigates the impact of both the U.S. and home country taxation on FDI in the U.S. It does this by first extending and updating the standard model of aggregate FDI in the U.S., and then disaggregating FDI by the country of the investing firm so as to facilitate the study of home country influences, including taxation.

The results of this new empirical approach are generally supportive of a negative impact of U.S. effective rates of taxation on total FDI and new transfers of funds, but not on retained earnings. The disaggregated analysis does not, though, provide much support for several propositions about the impact on FDI in the U.S. of foreign countries' tax rates and systems of taxing foreign-source income.

The remainder of the paper is organized as follows. Section 2 reviews the existing empirical literature, and Section 3 discusses some of the important issues regarding data on FDI in the U.S. The next two sections present the results of the data analyses--in Section 4 for aggregate FDI and in Section 5 separately for each of seven major investing countries. Section 6 concludes.

## 2. Review of the Existing Empirical Literature

It is generally accepted that foreign direct investment is primarily an issue of industrial organization. Dunning (1985, p. 6-7) has argued that FDI by firms of country A in country B is more likely if A's firms (i) possess ownership-specific advantages relative to B's firms in sourcing markets, (ii) find it profitable to use these advantages themselves rather than lease them to B's firms, and (iii) find it profitable to utilize their ownership-specific advantages in B rather than A. A large body of empirical literature has been addressed to testing this theory of international production, usually referred to as the "eclectic" theory. Much of this research has been cross-sectional, relating the extent of foreign investment in a given sector to characteristics of that sector that represent ownership-specific and location-specific comparative advantages. Several examples of this type of analysis are contained in Dunning (1985).

Studies of the effects of taxation on FDI have generally taken the perspective that whatever its benefits to firms are, they must be balanced against the tax consequences of carrying out FDI. The tax systems of both the firm's home country and potential host countries can affect the incentives concerning FDI as well as how to finance a given pattern of FDI. Theoretical treatments of these questions are presented in Alworth (1988) and Gersovitz (1987). The limited empirical literature on the impact of taxes on multinationals' behavior is summarized in Caves (1982).

Empirical study focusing on the effect of taxation on the time series of FDI in the U.S. was pioneered by Hartman (1984). Using annual data from 1965 to 1979 he estimated the response of FDI, separately for investment financed by retained earnings and transfers from abroad, to three variables: the after-tax rate of return realized by foreign investors in the U.S., the overall after-tax

rate of return on capital in the U.S., and the tax rate on U.S. capital owned by foreigners relative to the tax rate on U.S. capital owned by U.S. investors. The first two terms are meant to proxy for the prospective return to new FDI, the first term being more appropriate for firms considering expansion of current operations and the second more applicable to the acquisition of existing assets which are not expected to earn extraordinary returns based on production of differentiated products or possession of superior technology. The relative tax term is designed to capture the possibility that tax changes which apply only to U.S. investors will, by affecting the valuation of assets, alter the foreign investor's cost and therefore the return to acquiring the asset.<sup>1</sup>

Hartman does not attempt to measure either an effective withholding tax rate or the foreign income tax rate applied to the aggregate of foreign direct investment. He defends their absence by noting the likelihood that the average values of these tax rates are relatively constant over time. Furthermore, no attempt is made to measure the alternative rate of return available abroad to foreign investors.

Hartman's regression results reveal a positive association of both after-tax rate of return variables with the ratio to U.S. GNP of FDI financed by retained earnings, and a negative association of the FDI-GNP ratio with the relative tax rate on foreigners compared to domestic residents. The model does not explain transfers from abroad as well as retained earnings, although coefficients of all three variables have the expected sign and are significantly different from zero. Hartman concludes from this research that the effect of

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<sup>1</sup>Hartman argues that the variable measuring the rate of return to domestic capital, because it is based on replacement costs, will not capture these valuation effects.

taxes on FDI, both that implied by reinvestment of earnings and that accomplished by explicit transfer of funds, is quite strong.

Boskin and Gale (1986) re-estimate Hartman's equation using the updated tax rate and rate of return series from Feldstein and Jun (1986). Although the estimated elasticities of FDI to the rates of return are somewhat lower, none of the point estimates changes by more than one standard deviation. They also extend the sample forward to 1984, and in some cases backward to 1956, and experiment with a variety of alternative explanatory variables and functional forms. They conclude that although the results are somewhat sensitive to sample period and specification, the qualitative conclusions of Hartman are fairly robust.

Young (1988) uses revised data on investment, GNP and rates of return earned by foreigners to estimate similar equations. These changes increase the estimated elasticities with respect to the rate of return realized by foreigners and the relative rate of return. However, the equations for new transfers of funds estimated using the years 1956-84 yield very poor results, suggesting to Young that the simple Hartman model is inadequate for studying foreign direct investment through new funds when applied to the expanded sample period. Relaxing Hartman's assumption of a unitary income elasticity and including the lagged dependent variable as a right-hand side variable does not substantially alter the conclusions for retained earnings (although the estimated responsiveness is significantly lower), but the tax responsiveness of transfer of new funds still is not supported.

Newlon (1987) reexamines the results of Hartman as well as Boskin and Gale. During his attempt at replication, he discovered that the series measuring the rate of return on foreign direct investment, used in all earlier papers, had been miscalculated from the original Bureau of Economic Analysis

data for the years 1965 to 1973. Using the corrected series the equation explaining retained earnings does not fit as well, although the equation explaining transfers fits better. In explaining retained earnings, the estimated coefficients on the return to FDI and the tax ratio are slightly larger in absolute value and remain statistically significant, although the estimated coefficient on the net return in the U.S. is lower and is no longer statistically significant. For transfers of funds, the estimated coefficient on the return to FDI is much larger and becomes significant, although the estimated coefficient on the net return in the U.S. becomes smaller and insignificant. When the sample period is extended to range from 1956 to 1984, Newlon's results also differ from those of Hartman and those of Boskin and Gale. In particular, the equation explaining transfer of funds fits poorly, and no estimated coefficient is significant.<sup>2</sup>

It is notable that none of these studies has deviated very far from the approach taken in Hartman's 1984 paper. Although Young (1988) refers to Feldstein's (1982) dictum that, in the absence of a perfectly specified model, many alternative models should be investigated, the empirical research has been extremely one-tracked. This is a sufficient reason to explore alternative methodologies. Furthermore, there are several problems with the standard approach which bear further study.

In the previous literature, the disincentive to investment caused by the tax system is implicitly measured by an average tax rate, computed as total

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<sup>2</sup>Newlon also estimates variants of Hartman's original model with several additional variables, including a quadratic time trend, dummy variables for the years when data revisions were made, and with a definition of the return to direct investment that includes the fees and royalties that accrue to the parent from its foreign subsidiary. Most of these changes do not alter the qualitative results reported earlier.

taxes paid divided by a measure of profits. However, the incentive to undertake new investment depends on the effective marginal tax rate which, as is well known, can deviate substantially from an average tax rate concept.

None of the existing studies attempts to estimate the effect of the home country's tax system on FDI in the U.S. Of course, collecting the appropriate data is difficult and perhaps, as Hartman argued, these tax rates have not in fact varied much. The observed stability, though, applies to statutory tax rates and not necessarily to the more appropriate effective marginal tax rates. There is also a theoretical reason to focus attention on the host country tax rate. Hartman (1985) has argued that only the host country's tax system matters for investment coming from subsidiaries' earnings, even when the home country taxes its residents on the basis of worldwide income. This is because the home country's tax equally reduces the parent's return to an investment and the opportunity cost of making an investment (remitting a dividend to the parent).<sup>3</sup> Thus, for any subsidiary whose desired investment exceeds earnings, the tax due upon repatriation of earnings does matter. This situation would likely occur for newly formed subsidiaries. In any event, it is worthwhile to investigate empirically the impact of both the home country's rate of taxation and its system of taxing foreign-source income.

The interpretation of the estimated coefficient on the rate of return to FDI variable is also problematic, as stressed by Newlon. This rate of return is defined as the after-tax income from direct investment divided by the stock of direct investment. When the home country has a foreign tax credit with deferral, it is often optimal for the subsidiary to finance investment by first using retained earnings, and only when these earnings are exhausted to

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<sup>3</sup>If, however, the home country's tax system is expected to change, then there is an incentive to time repatriations appropriately.



use funds transferred from the parent firm. This hierarchy of financing implies that whenever a subsidiary's investment exceeds its retained earnings, its retained earnings will exactly equal its income. Thus for these firms we would expect a direct association between the calculated rate of return (in which after-tax income is the numerator) on FDI and retained earnings, regardless of whether the average rate of return in fact influences decisions concerning new FDI. As Newlon notes, if subsidiaries were following a fixed dividend payout rule (e.g., it pays out a fixed fraction of income), a direct association between income and retained earnings would also be observed. This argument may also apply to subsidiaries of firms residing in countries that employ territorial systems of taxation, thus rendering problematic any observed empirical association between FDI out of retained earnings and realized rate of return.

### 3. Data Issues

#### 3.1. Definition of FDI

FDI, as measured by the Bureau of Economic Analysis (henceforth BEA), consists of earnings retained by subsidiaries and branches of foreign parents and transfers of funds from the foreign parents to the U.S. firms, including both debt and equity transfers. Thus FDI does not correspond directly to any measure of real investment, as it excludes investment financed by funds raised locally (or in third countries) by the U.S. firm and includes purchases of existing assets by foreigners. It is more accurately thought of as a measure of financial flows rather than of real investment. Unfortunately, no data exists on real investment made by foreign branches and subsidiaries. Note also that the data does not distinguish between branches and subsidiaries, even though in general the tax treatment by the home country of the two forms

of organization is different. Finally, only in this decade has the data on transfers of funds been disaggregated into debt and equity transfers, rendering multivariate analysis impossible at this time.

### 3.2. Drift from Benchmark Years

The data on FDI in the U.S. is based on benchmark surveys conducted by BEA in 1959, 1974, and 1980. For nonbenchmark years, estimates for all series except equity and intercompany account inflows were constructed by extrapolating the benchmark data based on sample data from quarterly surveys. The 1959 benchmark data were extrapolated backward to construct estimates for 1950 to 1958 and were extrapolated forward to construct estimates for 1960 to 1973. The 1974 benchmark data were used to derive estimates for 1974 to 1979, and the 1980 benchmark data were used for estimates of 1980 and thereafter. Reported equity and intercompany account flows are taken directly from the quarterly sample with extrapolation, due to the unreliable relationship between the reported and unreported data.

Note that, except for 1959, the benchmark data is not used to revise the data based on the quarterly survey for earlier years. This procedure gives rise to the suspicion that data for nonbenchmark years misestimates true FDI. This suspicion has been confirmed for 1974, because the BEA has compared estimates based on the 1974 benchmark survey with estimates based on an extrapolation from the 1959 benchmark. For equity and intercompany account flows, the extrapolated total is \$2.50 billion compared to \$3.70 billion from the 1974 benchmark, an underestimate of more than one third. In contrast, for reinvested earnings the extrapolated figure is \$1.13 billion, actually higher than the benchmark figure of \$1.07 billion. The discrepancy between the two estimates varies widely by country and by industry, however.

Other important changes in concept and definition were introduced with the 1974 benchmark survey. The minimum ownership criterion in the definition of FDI was decreased from 25 to 10 percent, a change which in 1974 accounted for \$1.2 billion of the \$25.1 billion total FDI position in the U.S. Also in 1974 began major changes in the treatment of unrealized capital gains and losses, the classification of incorporated insurance affiliates, and the coverage of reverse equity ownership (U.S. affiliates' equity ownership in their foreign parents). Finally, starting in 1974 FDI was classified by the country of foreign parent - the first foreign person in the ownership chain of the U.S. affiliate. Before 1974, estimates for some affiliates were classified by the "ultimate beneficial owner," which is the person in the ownership chain, beginning with the foreign parent, that is not owned more than 50 percent by another person. This change in classification apparently affected several large affiliates so that the geographical distribution of the estimates was significantly affected.

Some of the earlier studies of FDI ignored these data definition issues, while others included a dummy variable to differentiate pre- and post- benchmark periods. However, none of the studies directly addressed the apparent problem that the further away from a benchmark year, the greater the survey-based numbers misreport actual FDI. To account for this tendency, in much of what follows I utilize a dummy variable whose value is the difference between the data year and the benchmark year from which the reported data is estimated. Thus this variable has a value of zero in the benchmark years 1959, 1974, and 1980 and a positive value in all other years since 1960 (when the benchmark data is extrapolated forward). It takes on a maximum value of 14 in 1973, when the benchmark data is extrapolated 14 years forward. This procedure allows for a constant amount of drift between benchmarks of the reported

FDI data. In addition, I consider a dummy variable for the period beginning in 1974 to account for the one-time changes in concepts, definitions, and classification of FDI by country that occurred in that year.

#### 4. Total Foreign Direct Investment in the U.S.

##### 4.1 Trends

Figure 1 shows the behavior of FDI in the U.S., as a ratio to U.S. gross national product (GNP), for the period 1953 to 1987. It also breaks down this ratio into two components - retained earnings and new transfers of funds, both as a ratio to U.S. GNP.

As Figure 1 shows, the ratio of FDI to GNP shows no clear trend until approximately 1972, when it began to grow quickly. By 1974, FDI amounted to 0.32% of GNP, or more than four times as high as the average percentage in the two decades from 1953 to 1972. A second surge of FDI began in 1978, pushing the ratio to a record 0.83% in 1981 and an average of 0.48% from 1982 to 1984, or five times higher than the 1953-1972 average and two and a half times the 1977 ratio. In 1987 FDI in the U.S. totalled nearly \$42.0 billion, or 0.94% of the GNP of \$4.49 trillion. Both the total FDI and ratio to GNP in 1987 were all-time highs.

One striking aspect of FDI is the decline within the last decade in the relative importance of retained earnings compared to new transfers of funds. Through 1980 retained earnings represented a large, stable component of total FDI, comprising 37.0% of the total. In 1977, the contribution of retained earnings relative to new transfers began to fall and by 1981 it began to decline in absolute terms as well. In the period 1981-7, retained earnings comprised only 1.4% of total FDI.

Is the rapid growth of FDI in the U.S. since 1972 part of a worldwide trend, or does it instead represent a relative shift of FDI to the U.S. from other locations? Figures 2 and 3 help to answer that question. Figure 2 shows that outward FDI from seven major investing nations to countries other than the U.S. was flat until 1969, when a large boom lasting until 1973 occurred, followed by relative stability and another surge from 1978 through 1981.<sup>4</sup> According to Figure 3, FDI in the U.S. as a fraction of the seven countries' worldwide FDI reached 40.5% in 1969, fell sharply until 1971, and then rose steadily until an all-time high of 43.7% was reached in 1981. It has remained at a high level since then. Apparently the strong growth of FDI in the U.S. starting in 1972 does indeed represent an increase in the relative strength of the U.S. as a location of FDI.

#### 4.2. Analysis

##### 4.2.1 Replication of Earlier Findings

As is ritual in this literature, I begin the analysis by trying to reproduce the aggregate time series results of a predecessor in the literature, in this case Newlon (1987). In a break from precedent, I am able to reproduce his main results to three significant digits. These results are reported in the first column of Tables 1 and 2. As discussed in Section 2, they suggest a strong positive association between the after-tax return on FDI (denoted  $r(1-t)$ ) and FDI financed by retained earnings, but not for new transfers of funds. The relative tax rate (denoted  $\frac{1-t^1}{1-t}$ ) variable and the overall

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<sup>4</sup>The seven countries, whose direct investment in the U.S. will be analyzed in more detail below, are Canada, France, Italy, Japan, the Netherlands, the United Kingdom, and West Germany.

rate of return (denoted  $r^1(1-t)$ ) have no significant effect on either component of FDI.<sup>5</sup>

Because of my uneasiness about the economic implications of a statistical association between the components of FDI and the measured average after-tax rate of return to capital, I next separate out as explanatory variables the average pre-tax rate of return earned by foreigners ( $r$ ), the average pre-tax rate of return earned on all capital in the U.S. ( $r^1$ ), and the two average tax rate terms ( $t$  for the tax rate on foreigners,  $t^1$  for the total tax rate including taxes paid by U.S. residents at the personal level).<sup>6</sup> The results are reported in the second column of Tables 1 and 2. While the pre-tax return to FDI retains a positive association with the ratio of retained earnings to GNP, neither tax term is significantly different than zero. However, this is not the case for transfers of funds. In this case the average tax rate faced by foreigners does have a statistically significant negative coefficient and, as suggested by the theory, the total tax rate faced by a U.S. investor has a positive coefficient.

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<sup>5</sup>There are several reasons for the striking differences between Hartman's results and the results reported in the first column of Tables 1 and 2. First, all the data has been corrected and updated. That procedure itself renders the coefficient on  $r^1(1-t)$  in the retained earnings equation to be insignificantly different from zero. Second, Hartman deals with the presence of a negative retained earnings value by adding a positive constant to the numerator of the dependent variable. Because the denominator (GNP) is growing with time, this is tantamount to adding a gradually declining value. Following Newlon, I add a constant to the left-hand side variable before taking the logarithm. This reduces the absolute value of most coefficients and renders  $r^1(1-t)$  insignificant in the transfers equation. Finally, the regressions of Tables 1 and 2 extend the sample period back from 1965 to 1956 and forward from 1979 to 1984. The latter eliminates the significance of  $r(1-t)$  in the transfer equation and the combination of the two renders  $(1-t^1)/(1-t)$  insignificant in both equations.

<sup>6</sup>As Hartman (1984) notes, no separate estimate of the pre-tax rate of return to FDI is available. The value used for  $r$  is obtained by assuming the average rate of corporate and property tax faced by foreigners in the U.S. ( $t$ ) is the same as that faced by U.S. residents, and solving for  $r$  using the known value of  $r(1-t)$ .

Note that these results concerning the tax rate variables reverse the conclusions of Hartman (1984), who concluded that the behavior of retained earnings was consistent with expectations, but that the estimated response of transfers of new funds did not conform to expectations. I attribute his first finding to the inevitable relationship between retained earnings and a measure of rate of return whose numerator is highly correlated with retained earnings.

I next replace the two measures of average tax rate by a measure of the marginal effective corporate tax rate on fixed investment ( $\tau$ ) in the U.S., as calculated by Auerbach and Hines (1988). This is arguably a better measure of the expected tax burden on a prospective new investment. These results, shown in column 3 of Tables 1 and 2, suggest that the U.S. marginal tax rate has had a significant effect on transfer of funds, but not on retained earnings.<sup>7</sup> The coefficient on the tax rate corresponds to a tax elasticity of transfers of -1.40, when evaluated at the average transfers to GNP ratio over the period.<sup>8</sup>

None of the previous work reports the results of equations explaining total FDI in the U.S., but considers only its component parts (retained earnings and transfer of funds). Table 3 reports the results of repeating the regressions of Tables 1 and 2 for total FDI. These results strongly support the negative association of total FDI with U.S. taxation. The elasticity of response is -1.16, slightly less than that estimated for transfers alone.

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<sup>7</sup>The conclusion does not depend on the log-linear specification. A linear version of these regressions yields the same conclusion.

<sup>8</sup>The tax elasticity is equal to  $\hat{\beta} \left( \frac{y+k}{\bar{y}} \right)$ , where  $\hat{\beta}$  is the estimated tax rate coefficient,  $\bar{y}$  is the average ratio of transfers to U.S. GNP, and  $k$  is the constant added to this ratio before taking the logarithm.

In Column 4 of Tables 1, 2, and 3, I present the results of the simplest possible formulation of this model, with only the effective marginal tax rate on new investment included as an explanatory variable. The principal reason for eliminating the rate of return variables is to investigate whether the estimated negative tax effect may be related to the definitional relationship between the dependent variable and these measures. The results do not indicate this problem is a real one. The tax variable still has no significant association with retained earnings, but does have a statistically significant negative association with transfers and total FDI.

#### 4.2.2. New Specifications

In this section the robustness of the finding that both new transfers of funds and total FDI, but not retained earnings, have a significant negative association with the effective rate of U.S. capital income taxation is tested against the kinds of specification changes suggested earlier. These changes are discussed below.

Linear Specification. The simple association between either total FDI or transfers and the effective tax rate survives the replacement of the logarithmic specification with a linear one. For both transfers and total FDI, the estimated tax rate coefficient implies an elasticity similar to what is obtained in the logarithmic specification; in both cases the estimated tax coefficient is insignificantly different from zero in explaining retained earnings.

Although there is no theoretical reason for preferring one specification to the other, because of the presence of negative dependent variables the logarithmic specification necessitates the addition to the unlogged value of an arbitrary constant. This procedure clouds the comparison of estimated



coefficients across equations, which becomes important below when home country disaggregation is done.

Including Other Explanatory Variables. The vector of explanatory variables is expanded to consider potential non-tax influences on foreign direct investment. In particular I include the following:<sup>9</sup>

RGDP: the ratio of total gross domestic product (GDP) of the seven major investing countries to U.S. GDP, where the foreign GDP's are valued at the purchasing power parity exchange rates calculated by Summers and Heston (1988). This variable is meant to capture the effect of the changing relative size of the principal investing countries compared to the U.S.

USUNEMP: the unemployment rate of prime-age males in the U.S. This variable is meant to capture potential business cycle effects on FDI.

REXC: the real exchange rate of the U.S. dollar against a GDP weighted average of the seven major investing countries' currencies. Dunning (1985) and Pugel (1985) have suggested that a low dollar reduces comparative production costs in the U.S., thus providing an incentive to FDI.

DRIFT: a dummy variable equal to the number of years elapsed since the previous benchmark survey of FDI conducted by BEA.<sup>10</sup>

Lagged Tax Rate Terms. Because of the time it takes to implement an investment decision, there may be a lag between changes in the effective tax rate and the impact on FDI. To allow for this possibility, not only the concurrent tax rate but also the tax rate lagged one year and two years are

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<sup>9</sup> See the data appendix for the definition and source of all the variables used in the analyses.

<sup>10</sup> Other potential influences on FDI, for which I was unable to obtain reasonable indices, include the extent of current and expected U.S. tariff and non-tariff barriers to imports, and the degree of quantitative restrictions, such as exchange controls, on outward foreign direct investment.

included as explanatory variables.<sup>11</sup> This procedure limits the length of the lag but imposes no structure on the time pattern of the lagged response of investment.

The results of estimating this specification are presented in the first column of Table 4. Of the non-tax explanatory variables, the estimated coefficients on USUNEMP, RGDP, and DRIFT are not significantly different than zero. The estimated coefficient on the real rate of exchange variable, REXC, is negative and significant, suggesting that a low dollar may in fact have stimulated FDI in the U.S.<sup>12</sup> Though not significant, the DRIFT parameter has the expected negative sign, suggesting that FDI may be increasingly underestimated as the time elapsed since the previous benchmark survey increases.

Of the tax rate variables, both the current value and the value lagged two years have a significant negative coefficient. There is substantial multicollinearity among the three tax variables, however. The t-statistic on the estimated sum of -13.3 of the three tax coefficients is -3.67, indicating that it is different than zero at a 95% level of confidence. The tax rate elasticity is -1.57 when evaluated at mean values for the entire period.

That this result is not robust to all reasonable specification changes is suggested by the results shown in the second column of Table 4. When a weighted average of the seven investing countries' unemployment rate is included (denoted FUNEMP), it is highly positively related to FDI and the tax

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<sup>11</sup>Of course this argument also applies to the other influences on FDI. One promising direction for future work is the investigation of more general lag structures.

<sup>12</sup>It has been argued that the strong dollar of the early 1980's was in part caused by tax incentives given to investment at that time. This suggests that an instrumental-variables estimation technique may be appropriate.

coefficients now sum to a positive rather than a negative number.<sup>13</sup> Thus a competing alternative explanation for the time series of FDI is that it has been propelled by deteriorating economic conditions in the home countries.<sup>14</sup> In order to focus on the possible tax influences on FDI, the analyses that follow do not include the foreign unemployment rate variable.

The third and fourth columns of Table 4 display the results of disaggregating FDI into retained earnings (RE) and transfers of funds (TR). The conclusion drawn from Tables 1 and 2 still holds--that transfers are associated with taxes negatively, but for retained earnings no negative association is apparent.<sup>15</sup> Finally, in the equation shown in the fifth column of Table 4 the dependent variable is FDI from manufacturing for four countries--Canada, Japan, the Netherlands, and the United Kingdom. The negative association with U.S. effective tax rates is still evident, although the estimated elasticity of response is about three-fifths of what it was for total FDI.

## 5. Foreign Direct Investment in the U.S. By Investing Country

### 5.1. Motivation and Theory of Cross-Country Comparisons

Most countries choose one of two basic options for taxing the income earned abroad by its domestic residents. Under a residence-based (or

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<sup>13</sup>Because of data availability, the sample period for this regression begins in 1969 rather than 1960. This is not, however, the source of the difference in results, because a version of the regression without FUNEMP that begins in 1969 also shows a significant negative tax effect.

<sup>14</sup>Another variable whose inclusion eliminates the tax effect is the dummy variable for the post-1974 era, justified above because the BEA definition of FDI was changed in 1974. Apparently much of the estimated tax effect reflects the simple fact that the post-1974 era is characterized by high FDI and low taxes, relative to the pre-1974 era.

<sup>15</sup>In fact, the sum of the tax coefficients has a positive sign that is significantly different from zero.

"worldwide") system, the capital-exporting country taxes its residents' income wherever it is earned. To avoid double taxation these countries as a rule allow their residents (individuals and corporations) to credit foreign taxes paid against the domestic tax owed on the foreign income. The credit is limited to the tax due under the home country's tax rules. Any home country tax liability in excess of the tax paid to foreign governments, sometimes termed the "repatriation tax," is generally deferred until dividends are remitted to the parent company. Under a source-based (also known as a "territorial" or "exemption") system, foreign-source income is exempt from home country taxation. Furthermore, no credit is given for taxes paid to foreign governments. Which principle applies for a given country may depend on the form the investment income takes (e.g., dividend, interest, capital gains), the location of the investment (e.g., treaty vs. non-treaty countries), and the extent of ownership and control exercised by the domestic owner.

The impact of a host country's tax structure on inward foreign investment depends on the tax system of the capital-exporting country. For example, when the country of capital export has an exemption tax system, the effective corporate-level rate of tax on FDI is equal to the tax rate imposed by the host country. Therefore differences among host country effective tax rates would be expected to have an impact on the location decision of investment from exemption countries. The impact of differences in host countries' tax structures would be expected to have less influence on foreign investment from countries which have worldwide tax systems with a foreign tax credit. In a simple case without deferral, unless the host country's tax rate is higher than the home country's tax rate, the effective tax rate on FDI becomes the home country's, regardless of the tax system of the host country. The effective tax rate is more complicated when there is deferral, multi-country

investment, and differing definitions of taxable income in different countries. Nevertheless, for firms based in foreign tax credit countries, the impact of the host country's tax system is filtered through the tax system of the home country, and may be substantially mitigated.

Of the major countries that make FDI in the U.S., some operate exemption systems while others operate a worldwide system with foreign tax credit. This fortuitous divergence of approach invites an investigation of whether the system of taxing foreign-source income is a factor in the responsiveness of FDI to host and home country taxation. In what follows I examine the time series of FDI in the U.S. emanating from seven countries, and investigate whether these time series are consistent with several propositions about the effect on FDI of tax rates and systems of taxing foreign-source income.

## 5.2. Trends

Figures 4A-10A and 4B-10B present the time series of FDI for each of seven major investing countries, in 4A-10A as a ratio of U.S. GNP and in 4B-10B as a ratio of total FDI in the U.S. by these seven countries. The figures generally show rapid growth in FDI beginning in the early 1970's. They also show the rise in the relative prominence of Japan, whose FDI was negligible in the 1960's but by 1985 represented nearly 20% of total FDI in the U.S., and the relative decline of FDI from Canada, which in the 1960's represented about 30% of FDI in the U.S. but by the 1980's comprised significantly less than 10% of total FDI. The largest investors for most of this period have been Canada, the Netherlands and the United Kingdom, challenged in the 1980's by Japan.

Another message that the figures convey is that FDI, while generally (i.e., except for Canada and Italy) growing as a fraction of U.S. GNP since

the early 1970's, has followed somewhat different paths in the seven countries. Therefore no single story is likely to be sufficient to explain the behavior of FDI from each of these countries.

### 5.3. Analysis

As discussed in Section 5.1, analysis of the FDI data disaggregated by the residence of the investing firms can shed further light on the impact of the host and home country's tax systems on the magnitude and location of foreign direct investment. Two empirical strategies are followed. In the first, separate FDI equations similar to those of Table 4 are estimated for each of the seven major investing countries. The differences in responsiveness in taxation are then related to the investing country's system of taxing foreign income. In particular, the response of countries with exemption systems is compared to countries with worldwide tax systems and a foreign tax credit. In the second approach, country-specific FDI equations are estimated utilizing time series data on the statutory corporate tax rates and the effective tax rates on new investment in the home country. These results are then examined for insights into several propositions relating to the effect of taxes on FDI.

Tables 5, 6, and 7 present the first set of results for country-specific FDI regressions. Ordinary least-squares is used in each case.<sup>16</sup> Table 5 contains the equations for retained earnings, Table 6 contains equations explaining transfer of funds, and Table 7 is concerned with total FDI, each expressed as a ratio to U.S. GNP. The explanatory variables used are identical to those used in the equations of Table 4, except that the overall GDP ratio and overall real exchange rate are replaced by country-specific variables.

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<sup>16</sup>I also experimented with the method of seemingly unrelated regressions to estimate the seven equations as a system. Because the results were very similar to those obtained using OLS, they are not reported here.

The countries are grouped by their system of taxing income from foreign direct investment in the U.S. In the first group are countries that effectively exempt such income from domestic taxation -- Canada, France, the Netherlands, and West Germany.<sup>17</sup> For these countries' firms it is the U.S. tax rate, unfiltered by home country tax rules, that affects the attractiveness of FDI in the U.S. compared to alternative investment locations and compared to no investment at all.

The second group of countries -- Italy, Japan, and the United Kingdom -- operate a foreign tax credit system with deferral for subsidiaries. U.S. tax is due on the income as earned. When income is repatriated to the home country, the grossed-up earnings are subject to home country taxation, but taxes paid to the U.S. government are credited against tax liability, as long as this liability does not exceed the home country liability on this income.

What the effective total tax rate on investment is in this situation has been the subject of some controversy. In the absence of deferral (and assuming that both home and host country use the same definition of income), the home country tax rate applies unless the host country tax rate exceeds the home country rate, in which case the host country rate applies. With deferral, Hartman (1985) has argued that the host country tax rate is the effective tax rate on investments which are financed by retained earnings, and the above reasoning applies to investments financed by new transfers of funds.

This brief look at received wisdom suggests the following propositions:

1. FDI from exemption countries should be at least as sensitive to U.S. tax rates as FDI from foreign tax credit countries.

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<sup>17</sup>By statute, Canada and West Germany operate foreign tax credit systems. However, both countries exempt from domestic taxation business-related income earned within the borders of its treaty partners, including the U.S.

2. The greater sensitivity of FDI from exemption countries for U.S. tax rates should be most apparent in the behavior of new transfers of funds.

The results shown in Table 6 offer strong corroboration for the negative association of U.S. tax rates and FDI financed by transfers of funds. The summed tax coefficient is negative for all seven countries, and significantly different from zero in four of these cases. The estimated tax effect on retained earnings, shown in Table 5, range from significant positive to significant negative, with no clear trend emerging. For total FDI (shown in Table 7), the tax effect is significantly negative for four of seven countries. The tax effect in these four countries sum to more than the tax effect shown in the first column of Table 4.

The regression analyses are not strongly supportive of propositions 1 and 2. The four countries which have a significant tax effect on transfers and total FDI are evenly divided between exemption countries (Netherlands and West Germany) and foreign tax credit countries (Japan and the United Kingdom). The association of tax rates with retained earnings also has no obvious pattern according to the tax system.

Table 8 displays the results of repeating the regressions explaining total FDI for manufacturing investment only. This data is fully available for only four of the seven countries--Canada, Japan, the Netherlands, and the United Kingdom. The summed tax effect for Japan and United Kingdom remains negative and significantly different from zero. The magnitude of the estimated effect shrinks substantially in the case of Japan, reducing the elasticity from -2.90 to -2.25. The estimated elasticity for the United Kingdom stays about the same as for total FDI. For Canada and the Netherlands, the summed tax effect is, as for total FDI, not significantly different from zero.



5.4. The Effect of Home Country Taxation on FDI in the U.S.

The rate of home country taxation may influence FDI in the U.S. through at least two different avenues. First, it affects the after-tax return to investment in the home country, which is presumably an alternative to FDI. For this reason we would expect the home country tax rate to be positively associated with FDI in the U.S.

A second avenue of influence applies only to home countries that operate a foreign tax credit system, and not countries which operate an exemption system. Ignoring deferral and assuming that the multinational operates only in at most the home country and the U.S., the effective tax rate on income from FDI is the maximum of the U.S. rate and the home country rate.<sup>18</sup> When the home country rate exceeds the U.S. rate, it is the effective tax rate on both home country investment and FDI, and so its level does not affect the relative after-tax returns of the alternative investments, although it does depress the return of all investment alternatives. In a more general situation, when there is deferral and multicountry operation, the home country tax rate will increase the effective tax rate on FDI, though by less than it increases the tax rate on investment in the home country. Recall, however, Hartman's demonstration that, for investment out of retained earnings, only the host country's tax rate is relevant.

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<sup>18</sup>The home country effective tax rates technically apply to domestically-located investment. If the tax law discriminates investment by location (as the U.S. tax law does), then the series on effective tax rates may not accurately capture the tax law's impact on foreign-source income. For example, French and Japanese corporations engaged in foreign investment are entitled to deduct from taxable income certain special reserves. Other details of the home country's tax system may also be important, particularly the degree of corporate and personal tax integration. For example, although by treaty dividends from U.S. subsidiaries to West German parent corporations are untaxed by the West German government, if and when exempt foreign-source income is distributed to shareholders by the parent, it is taxed differently than dividends from earnings on domestic-source income.

This review of the effects of home country taxation on FDI suggests the following propositions:

3. FDI from exemption countries should be positively related to the rate of home country taxation.

4. FDI financed by new transfers of funds from foreign tax credit countries should have a less clearly positive, or even negative, relationship to home country taxation.

5. Retained earnings from foreign tax credit countries should be unaffected by, or positively related to, home country taxation.

Statutory tax rates have an influence on multinationals' decisions, independent of their impact operating through the effective tax rates on investment. A multinational has an incentive to do its borrowing through firms operating in a country with relatively high statutory rates, so as to maximize the tax benefits of the interest deductions. This would imply a negative relationship between the volume of transfers and the difference between the U.S. statutory rate and the home country statutory rate. A multinational also has an incentive to set transfer prices so as to show lower income in countries with relatively high statutory rates. Holding other policies constant, this also implies a negative relationship between reported retained earnings and the difference between the U.S. statutory rate and the home statutory rate. These effects should be stronger for exemption countries compared to foreign tax credit countries. They should also depend only on current statutory tax rates, with no lagged effect as in the case of investment incentives. The following proposition summarizes these incentives:

6. Both retained earnings and transfers of funds should be negatively related to the current differential between the U.S. statutory corporate rate

and the home country statutory corporate rate, with the effect stronger for exemption countries.

Tables 9, 10, and 11 present the results of adding four variables to each country-specific regression equation: (i) the effective corporate-level tax rate on new investment in the home country, including the current rate and two lags and (ii) the difference between the U.S. statutory corporate tax rate and the home country statutory corporate tax rate. Note that these tax rate series are not available for the Netherlands, so that regression results for only six countries are presented.

The results do not provide much support for Propositions 3-5. According to Table 11, in no exemption country is the home country's tax rate positively related to FDI. Table 10 reveals that the effect of home country taxation on transfers is not obviously more negative for foreign tax credit countries composed to exemption countries. Table 9 does suggest that retained earnings are, as proposed, not usually affected by home country taxation in foreign tax credit countries. Proposition 6 fares slightly better, with a significant coefficient of the expected negative sign on the difference in statutory rates occurring for West Germany and Italy (for transfers of funds and total FDI), and no case of a significant positive sign occurring. Note also that the estimated negative effect of U.S. taxation on total FDI for West Germany and Japan disappears when the home country tax rates are included, although a negative effect of U.S. taxes on Canadian investment appears when it did not in the absence of home country tax rates.

There are several possible explanations for the lack of a clear difference in the tax responsiveness of FDI from exemption and foreign tax credit countries. One is that the data is simply not good enough to pick up the differences in behavior that do in fact exist. In particular, the effective tax

rate series have well-known problems as an accurate measure of the disincentives to invest. Alternatively, it may be that the ability of firms from foreign tax credit countries to defer indefinitely home country taxation and to engage in sophisticated financial transactions renders insignificant the effective rate of home country taxation. If the latter hypothesis is true, then the U.S. tax rate is the important source of investment disincentives for all capital-importing countries, regardless of their system of alleviating international double taxation.

#### 6. Conclusions

This research was undertaken in order to shed light on the role of both U.S. and investing country tax systems on foreign direct investment in the U.S. Two distinct approaches were attempted. In the first, the standard empirical model relating total FDI in the U.S. to U.S. taxation was respecified to (i) eliminate the spurious bias caused by relating retained earnings to a measure of rate of return that would be behaviorally related to retained earnings, (ii) use a measure of the marginal effective rate of tax on new investment, rather than an observed average or statutory tax rate, (iii) hold constant the influence of non-tax variables on FDI, and (iv) take account of the data collection process which introduces increasing underestimation of FDI as the time elapsed from the previous benchmark survey of FDI increases. The results of this new empirical approach are generally supportive of a negative impact of U.S. effective rates of taxation on total FDI and transfers of funds, but not on retained earnings. There is, however, at least one very successful alternative explanation of FDI in the U.S.--that it is propelled by stagnation in the home country, as measured by its unemployment rate of prime-age males--that precludes the association of U.S. tax rates with FDI.

In the second approach I examined the time series of FDI in the U.S. disaggregated by the seven major investing countries. This disaggregation allows a detailed examination of the effect on FDI in the U.S. of the rates of home country taxation and the home country's system of taxing foreign source income (i.e., exemption versus worldwide taxation with a foreign tax credit). The results of these country analyses generally corroborate the aggregate analysis of the effect of U.S. taxes on FDI. However, they are not generally supportive of several propositions about the differential tax sensitivity of FDI from countries that exempt foreign-source income from domestic taxation compared to countries that tax worldwide income and offer a foreign tax credit to mitigate double taxation. The inability to support these propositions may be due either to the difficulties in accurately measuring home country effective tax rates or may indicate that, because of deferral and the availability of sophisticated financial strategies, the home country tax rate and its system of alleviating international double taxation is not an important determinant of foreign direct investment.

Table 1

Regression Results for FDI Financed by Retained Earnings, 1956-84

<u>Independent Variables</u>					
$\tau$			-0.0068 (0.0846)		0.223 (0.141)
$t$		0.493 (0.608)			
$t^1$		-0.494 (0.835)			
$r$		0.800 (0.105)	0.788 (0.094)		
$r^1$		-0.120 (0.302)	0.062 (0.158)		
$r(1-t)$	0.766 (0.094)				
$r^1(1-t)$	0.048 (0.193)				
$\frac{1-t^1}{1-t}$	-0.154 (0.263)				
Intercept	2.602 (0.510)	2.486 (0.574)	2.71 (0.422)		0.780 (0.152)
Durbin-Watson statistic	1.82	2.04	1.92		1.47
$\overline{R^2}$	0.734	0.731	0.731		0.050

Notes:

1. Dependent variable is the logarithm of  $((1000 \cdot RE / GNP + 1.23))$ .
2. Column 1 corresponds to equation 2 of Table II.2b in Newlon (1987).
3. All independent variables are in logarithms.
4. Standard errors in parentheses.

Table 2

Regression Results for FDI Financed by Transfers of Funds, 1956-84

<u>Independent Variables</u>				
$\tau$			-0.683 (0.123)	-0.826 (0.183)
$t$		-2.790 (0.874)		
$t^1$		1.788 (1.202)		
$r$		0.167 (0.152)	0.367 (0.137)	
$r^1$		-1.112 (0.434)	-1.46 (0.231)	
$r(1-t)$	-0.070 (0.283)			
$r^1(1-t)$	-0.319 (0.582)			
$\frac{1-t^1}{1-t}$	-1.011 (0.793)			
Intercept	-0.485 (1.541)	-2.429 (0.827)	-2.07 (0.617)	0.195 (0.197)
Durbin-Watson statistic	0.34	1.67	1.80	0.68
$\overline{R^2}$	0.104	0.794	0.788	0.407

Notes:

1. Dependent variable is the logarithm of  $((1000 \cdot TR/GNP) + 1.676)$ .
2. Column 1 corresponds to equation 4 of Table II.2b in Newlon (1987).
3. All independent variables are in logarithms.
4. Standard errors in parentheses.

Table 3

Regression Results for Total FDI, 1956-84

<u>Independent Variables</u>					
$\tau$			-1.161 (0.240)		-1.281 (0.326)
$t$		-5.646 (1.696)			
$t^1$		4.476 (2.332)			
$r$		0.641 (0.294)	1.082 (0.266)		
$r^1$		-1.632 (0.843)	-2.666 (0.449)		
$r(1-t)$	0.278 (0.498)				
$r^1(1-t)$	-0.477 (1.024)				
$\frac{1-t^1}{1-t}$	-2.157 (1.396)				
Intercept	-1.215 (2.712)	-4.079 (1.603)	-4.18 (1.198)		-0.978 (0.367)
Durbin-Watson statistic	0.46	1.67	1.80		0.60
$\overline{R^2}$	0.183	0.772	0.765		0.332

Notes:

1. Dependent variable is the logarithm of (1000•FDI/GNP).
2. All independent variables are in logarithms.
3. Standard errors in parentheses.



Table 4

Further Regression Results for FDI

Sample Period	1960-87	1969-87	1960-87	1960-87	1960-87
Dependent Variable	FDI/GNP	FDI/GNP	RE/GNP	TR/GNP	FDIMF/GNP
Mean of Dependent Variable	2.85	3.91	0.54	2.31	0.61
<u>Independent Variables</u>					
$\tau$	-7.11 (7.22)	8.81 (11.35)	1.40 (1.87)	-8.51 (7.08)	0.660 (1.96)
$\tau_{-1}$	4.28 (8.35)	9.47 (9.23)	-0.199 (2.16)	4.48 (8.17)	-0.53 (2.27)
$\tau_{-2}$	-10.25 (6.25)	10.82 (10.87)	0.689 (1.61)	-10.94 (6.11)	-2.27 (1.70)
RGDP	-1.36 (6.63)	15.78 (20.29)	0.551 (1.71)	-1.91 (6.48)	-3.37 (1.80)
USUNEMP	10.24 (40.32)	-183.0 (77.92)	-14.95 (10.41)	25.19 (39.42)	13.07 (10.94)
FUNEMP		440.61 (177.41)			
REXC	-6.21 (3.30)	-4.31 (3.77)	-1.49 (0.851)	-4.72 (3.22)	-2.83 (0.894)
DRIFT	-0.036 (0.114)	-0.135 (0.148)	-0.050 (0.029)	0.014 (0.111)	0.0412 (0.0309)
Intercept	16.18 (9.66)	-23.70 (31.33)	2.00 (2.50)	14.18 (9.45)	7.77 (2.62)
$\tau + \tau_{-1} + \tau_{-2}$	-13.08 (3.46)	29.10 (18.72)	1.89 (0.89)	-14.98 (3.38)	-2.14 (0.939)
Durbin-Watson statistic	1.30	1.29	1.87	1.24	1.39
$\bar{R}^2$	0.677	0.717	0.455	0.696	0.558

Notes:

1. FDI is measured in \$ millions, and GNP is measured in \$ billions, so that the dependent variable is 1000 times the actual value of FDI divided by GNP.
2. Standard errors in parentheses.

Table 5

## Regression Equations Explaining Retained Earnings, By Investing Country

Country	<u>"Exemption" Countries</u>				<u>Foreign Tax Credit Countries</u>		
	Canada	France	Netherlands	West Germany	Italy	Japan	United Kingdom
Sample Period	1960-87	1962-87	1960-87	1962-87	1962-87	1960-87	1960-87
Mean of Dependent Variable	0.0547	-0.00561	0.212	0.0114	-0.00885	0.0677	0.160
<u>Independent Variables</u>							
$\tau$	0.692 (0.555)	0.180 (0.133)	-0.168 (0.829)	-0.010 (0.331)	0.053 (0.049)	-0.229 (0.378)	0.479 (0.266)
$\tau_{-1}$	-0.324 (0.635)	0.0076 (0.142)	0.947 (0.913)	-0.109 (0.353)	0.022 (0.053)	-0.239 (0.437)	-0.479 (0.313)
$\tau_{-2}$	0.478 (0.517)	-0.0053 (0.106)	-0.452 (0.675)	-0.189 (0.260)	-0.0013 (0.040)	0.132 (0.334)	0.384 (0.273)
RGDP	8.72 (3.85)	0.162 (0.594)	-36.04 (25.89)	5.35 (2.30)	0.116 (0.374)	1.764 (0.778)	0.200 (2.18)
USUNEMP	-5.55 (2.57)	-1.28 (0.789)	-1.34 (3.99)	-3.21 (1.74)	-0.229 (0.275)	-2.18 (2.16)	0.34 (1.17)
REXC	0.307 (0.528)	-0.026 (0.0086)	-0.283 (0.122)	0.095 (0.045)	-0.000047 (0.000019)	0.0010 (0.0006)	-0.535 (0.156)
DRIFT	-0.0127 (0.0076)	-0.0012 (0.0019)	-0.017 (0.012)	-0.0015 (0.0044)	-0.00045 (0.00065)	-0.0069 (0.0064)	0.0034 (0.0043)
Intercept	-1.07 (0.96)	0.124 (0.115)	2.76 (1.30)	-1.09 (0.50)	0.0164 (0.0567)	-0.517 (0.337)	0.401 (0.379)
$\tau + \tau_{-1} + \tau_{-2}$	0.846 (0.361)	0.183 (0.068)	0.327 (0.526)	-0.398 (0.244)	0.074 (0.027)	-0.136 (0.192)	-0.0012 (0.172)
Durbin-Watson statistic	2.08	1.05	1.44	1.87	1.25	1.26	1.95
$\bar{R}^2$	0.479	0.759	0.304	0.099	0.543	0.240	0.390

See notes to Table 4.

Table 6

## Regression Equations Explaining Transfers of Funds, By Investing Country

Country	"Exemption" Countries				Foreign Tax Credit Countries		
	Canada	France	Netherlands	West Germany	Italy	Japan	United Kingdom
Sample Period	1960-87	1962-87	1960-87	1962-87	1962-87	1960-87	1960-87
Mean of Dependent Variable	0.227	0.113	0.369	0.192	0.0233	0.263	0.597
<u>Independent Variables</u>							
$\tau$	-0.857 (1.14)	-0.931 (0.818)	-0.108 (1.32)	-1.93 (0.960)	-0.219 (0.165)	-1.59 (1.17)	0.196 (2.53)
$\tau_{-1}$	0.389 (1.31)	0.561 (0.874)	0.577 (1.45)	2.17 (1.02)	0.126 (0.178)	0.633 (1.351)	-1.69 (2.98)
$\tau_{-2}$	-0.0164 (1.065)	-0.613 (0.650)	-1.099 (1.071)	-1.57 (0.756)	0.0287 (0.132)	-1.47 (1.03)	-2.79 (2.59)
RGDP	17.7 (7.94)	0.940 (3.65)	-68.8 (41.1)	-3.72 (6.67)	2.53 (1.25)	-4.90 (2.41)	-0.879 (22.6)
USUNEMP	-4.90 (5.28)	-1.35 (4.84)	11.02 (6.33)	-1.55 (5.06)	-0.113 (0.917)	5.80 (6.67)	13.5 (11.1)
REXC	1.48 (1.09)	-0.070 (0.053)	-0.472 (0.194)	-0.229 (0.129)	0.000176 (0.0000655)	-0.00476 (0.00186)	-2.79 (1.48)
DRIFT	-0.00882 (0.0157)	-0.0018 (0.0119)	0.00992 (0.0191)	0.00265 (0.0128)	-0.00340 (0.00216)	0.0136 (0.0198)	0.0630 (0.0409)
Intercept	-2.67 (1.98)	0.765 (0.709)	4.55 (2.07)	2.11 (1.45)	-0.477 (0.189)	3.70 (1.04)	3.17 (3.60)
$\tau + \tau_{-1} + \tau_{-2}$	-0.485 (0.744)	-0.984 (0.416)	-0.639 (0.834)	-1.33 (0.651)	-0.0640 (0.0888)	-2.43 (0.593)	-4.30 (1.63)
Durbin-Watson statistic	2.07	1.20	1.30	1.32	2.09	1.76	1.12
$\overline{R^2}$	0.238	0.197	0.608	0.421	0.446	0.695	0.600

See notes to Table 4.

Table 7  
Regression Equations Explaining Total FDI, By Investing Country

Country	<u>"Exemption" Countries</u>				<u>Foreign Tax Credit Countries</u>		
	Canada	France	Netherlands	West Germany	Italy	Japan	United Kingdom
Sample Period	1960-87	1962-87	1960-87	1962-87	1962-87	1960-87	1960-87
Mean of Dependent Variable	0.282	0.112	0.581	0.203	0.0144	0.331	0.757
<u>Independent Variables</u>							
$\tau$	-0.165 (1.33)	-0.751 (0.783)	-0.276 (1.49)	-2.03 (0.965)	-0.166 (0.163)	-1.82 (1.15)	0.666 (2.64)
$\tau_{-1}$	0.0666 (1.52)	0.568 (0.834)	1.52 (1.64)	2.06 (1.03)	0.148 (0.176)	0.394 (1.33)	-2.25 (3.11)
$\tau_{-2}$	0.462 (1.24)	-0.618 (0.621)	-1.55 (1.21)	-1.76 (0.759)	0.0274 (0.130)	-1.34 (1.02)	-2.71 (2.71)
RGDP	26.4 (9.24)	1.10 (3.49)	-105 (46.4)	1.63 (6.70)	2.65 (1.23)	-3.13 (2.37)	-0.679 (23.6)
USUNEMP	-10.4 (6.15)	-2.63 (4.63)	9.67 (7.16)	-4.75 (5.08)	-0.341 (0.905)	3.63 (6.56)	14.8 (11.6)
REXC	1.78 (1.26)	-0.0960 (0.0503)	-0.755 (0.219)	-0.134 (0.130)	0.000128 (0.0000647)	-0.00373 (0.00183)	-3.32 (1.55)
DRIFT	-0.0215 (0.0183)	-0.00299 (0.0114)	-0.0068 (0.0215)	0.00119 (0.0128)	-0.00385 (0.00214)	-0.00688 (0.0195)	0.0664 (0.0408)
Intercept	-3.75 (2.31)	0.888 (0.678)	7.32 (2.33)	1.03 (1.46)	-0.461 (0.187)	3.18 (1.02)	3.57 (3.76)
$\tau + \tau_{-1} + \tau_{-2}$	0.361 (0.865)	-0.801 (0.398)	-0.302 (0.943)	-1.72 (0.654)	0.0101 (0.0877)	-2.76 (0.583)	-4.30 (1.71)
Durbin-Watson statistic	2.02	2.04	1.22	1.60	2.10	1.84	1.09
$\bar{R}^2$	0.135	0.182	0.673	0.375	0.360	0.745	0.606

See Notes to Table 4.

Table 8

Regression Equations Explaining Total FDI in Manufacturing,  
By Investing Country

Country	<u>"Exemption" Countries</u>		<u>Foreign Tax Credit Countries</u>	
	Canada	Netherlands	Japan	United Kingdom
Sample Period	1960-87	1960-87	1960-87	1960-87
Mean of Dependent Variable	0.160	0.152	0.0514	0.267
<u>Independent Variables</u>				
$\tau$	0.129 (0.477)	0.356 (0.874)	0.105 (0.312)	0.462 (1.15)
$\tau_{-1}$	0.0419 (0.546)	-0.232 (1.01)	-0.231 (0.343)	-0.723 (1.36)
$\tau_{-2}$	-0.674 (0.444)	-0.173 (0.773)	-0.207 (0.254)	-1.21 (1.18)
RGDP	9.57 (3.31)	-1.19 (1.80)	-10.3 (9.73)	0.0639 (10.31)
USUNEMP	-2.84 (2.20)	2.71 (4.99)	0.192 (1.50)	2.26 (5.07)
REXC	0.542 (0.453)	-0.00171 (0.00139)	-0.0687 (0.0459)	-1.69 (0.675)
DRIFT	-0.00707 (0.00656)	0.00322 (0.0148)	0.000990 (0.00451)	0.0301 (0.0187)
Intercept	-1.21 (0.827)	1.02 (0.779)	0.839 (0.489)	1.65 (1.64)
$\tau + \tau_{-1} + \tau_{-2}$	0.103 (0.310)	-0.369 (0.444)	-0.333 (0.198)	-1.47 (0.744)
Durbin-Watson statistic	2.14	1.96	1.46	0.711
$\bar{R}^2$	0.197	0.169	0.452	0.466

See notes to Table 4.

Table 9

Regression Equations Explaining Retained Earnings Using Home Country Tax Rates, by Investing Country

Country	<u>"Exemption" Countries</u>			<u>Foreign Tax Credit Countries</u>		
	Canada	France	West Germany	Italy	Japan	United Kingdom
Sample Period	1965-86	1962-87	1962-87	1962-87	1972-87	1962-87
Mean of Dependent Variable	0.0469	-0.00561	0.0114	-0.00885	0.105	0.162
<u>Independent Variables</u>						
$\tau$	0.873 (1.00)	0.223 (0.166)	-0.0421 (0.315)	0.0296 (0.0550)	0.239 (1.58)	0.179 (0.326)
$\tau_{-1}$	-0.242 (0.874)	-0.0230 (0.154)	0.119 (0.333)	0.0227 (0.0525)	-0.135 (0.983)	-0.530 (0.402)
$\tau_{-2}$	-0.205 (0.795)	-0.0527 (0.122)	-1.04 (0.442)	0.0542 (0.0546)	0.788 (1.09)	-0.0263 (0.422)
$T$	-0.00594 (0.916)	0.0577 (0.114)	2.37 (1.14)	-0.106 (0.0612)	-6.17 (8.59)	0.00948 (0.294)
$T_{-1}$	0.291 (0.632)	0.0793 (0.102)	-0.658 (0.804)	-0.0403 (0.0729)	7.09 (8.06)	0.0686 (0.262)
$T_{-2}$	-0.560 (0.693)	0.0195 (0.138)	0.433 (0.865)	0.0761 (0.0533)	4.73 (6.51)	0.156 (0.303)
DIFSTAT	-2.07 (3.11)	0.464 (0.373)	1.72 (1.03)	-0.0907 (0.102)	0.419 (2.58)	-0.0274 (0.535)
RGDP	16.6 (9.85)	-0.0211 (0.937)	-1.32 (3.87)	0.720 (0.632)	6.03 (10.5)	-0.464 (3.62)
USUNEMP	-5.66 (4.85)	-1.07 (0.883)	-0.301 (1.96)	-0.427 (0.394)	-13.3 (9.93)	1.11 (1.43)
REXC	0.323 (0.740)	-0.0281 (.0101)	-0.0191 (0.0707)	-0.0000549 (0.0000206)	0.00181 (0.00165)	-0.439 (0.235)
DRIFT	-0.00396 (0.0183)	0.0000356 (0.00253)	0.0115 (0.00641)	-0.00150 (0.00160)	-0.0230 (0.0244)	0.00629 (0.00735)
Intercept	-1.74 (1.43)	0.0904 (0.154)	-0.624 (0.644)	-0.0225 (0.0652)	-3.06 (2.40)	0.497 (0.587)
$\tau + \tau_{-1} + \tau_{-2}$	0.836 (1.12)	0.148 (0.0855)	-0.963 (0.427)	0.107 (0.0302)	0.891 (1.59)	-0.779 (0.254)
$T + T_{-1} + T_{-2}$	-0.263 (1.68)	0.157 (0.207)	2.15 (0.897)	-0.0704 (0.0610)	5.65 (6.57)	0.244 (0.280)
Durbin-Watson statistic	2.46	1.25	1.69	1.52	1.10	2.73
$\bar{R}^2$	0.361	0.737	0.273	0.573	-0.145	0.219

See notes to Table 4.

Table 10

Regression Equations Explaining Transfers of Funds Using Home Country Tax Data, by Investing Country

Country	<u>"Exemption" Countries</u>			<u>Foreign Tax Credit Countries</u>		
	Canada	France	West Germany	Italy	Japan	United Kingdom
Sample Period	1965-86	1962-87	1962-87	1962-87	1972-87	1962-87
Mean of Dependent Variable	0.269	0.113	0.192	0.0233	0.491	0.637
<u>Independent Variables</u>						
T	-1.70 (1.70)	-1.42 (1.05)	-1.63 (0.897)	-0.369 (0.187)	0.667 (4.50)	-0.179 (2.13)
T <sub>-1</sub>	-0.170 (1.48)	0.863 (0.965)	1.93 (0.949)	0.140 (0.179)	-0.239 (2.81)	-3.61 (2.62)
T <sub>-2</sub>	-0.235 (1.35)	-0.520 (0.769)	1.39 (1.26)	0.221 (0.186)	-0.0543 (3.12)	0.105 (2.75)
T	0.246 (1.56)	0.253 (0.716)	-6.76 (3.25)	-0.389 (0.208)	16.6 (24.6)	1.15 (1.91)
T <sub>-1</sub>	2.24 (1.07)	-0.0640 (0.639)	-1.64 (2.29)	0.123 (0.248)	-17.2 (23.0)	2.69 (1.71)
T <sub>-2</sub>	0.707 (1.18)	-0.816 (0.866)	4.79 (2.47)	-0.0671 (0.181)	16.1 (18.6)	1.55 (1.98)
DIFSTAT	-5.82 (5.28)	-2.17 (2.35)	-7.58 (2.95)	-0.562 (0.347)	5.41 (7.39)	-2.02 (3.49)
RGDP	40.1 (16.7)	-0.286 (5.89)	11.7 (11.0)	5.58 (2.15)	-32.1 (30.1)	-37.9 (23.6)
USUNEMP	-11.0 (8.24)	-1.98 (5.55)	-9.87 (5.60)	-1.56 (1.34)	26.7 (28.4)	13.0 (9.64)
REXC	1.64 (1.26)	-0.0910 (0.0635)	0.261 (0.201)	0.000159 (0.0000701)	-0.0104 (0.00472)	-3.08 (1.53)
DRIFT	-0.00938 (0.310)	-0.00668 (0.0159)	-0.0351 (0.0183)	-0.0108 (0.00544)	0.0196 (0.0697)	0.0526 (0.0479)
Intercept	-4.79 (2.43)	1.49 (0.969)	-1.43 (1.84)	-0.638 (0.222)	9.37 (6.86)	8.59 (3.83)
T <sub>-1</sub> +T <sub>-2</sub>	-1.95 (1.27)	-1.08 (0.537)	1.69 (1.22)	-0.00784 (0.103)	0.374 (4.55)	-3.69 (1.66)
T+T <sub>-1</sub> +T <sub>-2</sub>	3.19 (2.86)	-0.627 (1.30)	-3.61 (2.56)	-0.333 (0.208)	15.5 (18.8)	5.39 (1.82)
Durbin-Watson statistic	2.09	1.96	2.28	2.44	1.76	1.78
R <sup>2</sup>	0.304	0.0818	0.549	0.463	0.512	0.760

See notes to Table 4.

Table 11

Regression Equations Explaining Total FDI Using Home Country Tax Data, By Investing Country

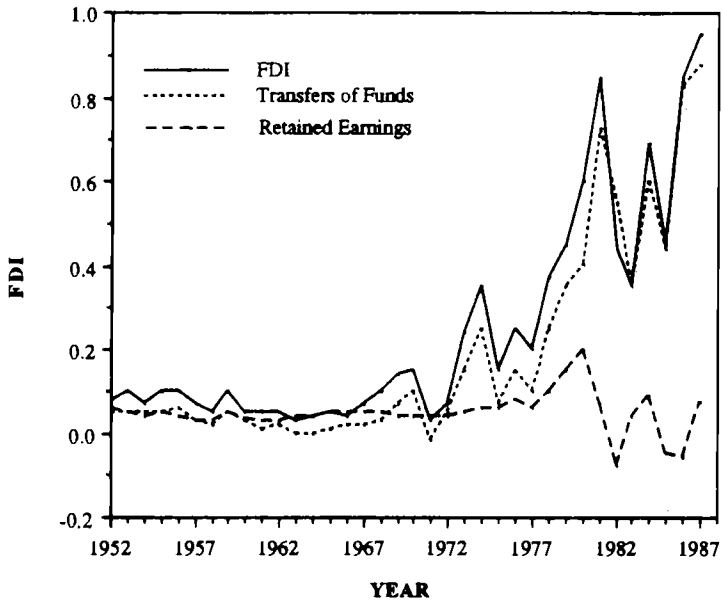
Country	<u>"Exemption" Countries</u>			<u>Foreign Tax Credit Countries</u>		
	Canada	France	West Germany	Italy	Japan	United Kingdom
Sample Period	1965-86	1962-87	1962-87	1962-87	1972-87	1962-87
Mean of Dependent Variable	0.0316	0.112	0.203	0.0144	0.596	0.799
<u>Independent Variables</u>						
T	-0.829 (2.10)	-1.20 (1.01)	-1.67 (0.982)	-0.339 (0.172)	0.906 (3.88)	0.299 (2.28)
T <sub>-1</sub>	-0.259 (1.83)	0.840 (0.928)	2.05 (1.04)	0.163 (0.164)	-0.374 (2.42)	-4.14 (2.82)
T <sub>-2</sub>	-0.0302 (1.66)	-0.572 (0.740)	0.349 (1.38)	0.275 (0.171)	0.733 (2.63)	0.0784 (2.96)
T	0.252 (1.92)	0.311 (0.689)	-4.39 (3.55)	-0.495 (0.191)	10.5 (21.1)	1.16 (2.06)
T <sub>-1</sub>	2.53 (1.32)	0.0153 (0.614)	-2.30 (2.51)	0.0828 (0.228)	-10.2 (19.8)	2.76 (1.84)
T <sub>-2</sub>	0.147 (1.45)	-0.797 (0.833)	5.22 (2.70)	0.00902 (0.166)	20.8 (16.0)	1.72 (2.12)
DIFSTAT	-7.88 (6.52)	-1.70 (2.26)	-5.86 (3.23)	-0.653 (0.318)	5.83 (6.36)	1.75 (3.75)
RGDP	56.8 (20.6)	-0.307 (5.67)	10.4 (12.1)	6.30 (1.97)	-26.0 (25.9)	-38.7 (25.4)
USUNEMP	-16.6 (10.2)	-3.06 (5.34)	-10.2 (6.13)	-1.99 (1.23)	13.3 (24.4)	14.3 (10.4)
REXC	1.97 (1.55)	-0.119 (0.0611)	0.242 (0.220)	0.000105 (0.0000643)	-0.00863 (0.00406)	-3.52 (1.64)
DRIFT	-0.0133 (0.0383)	-0.0664 (0.0153)	-0.0235 (0.0200)	-0.0123 (0.00499)	-0.00340 (0.0600)	0.0588 (0.0515)
Intercept	-6.53 (2.99)	1.58 (0.932)	-2.05 (2.01)	-0.660 (0.203)	6.31 (5.90)	9.09 (4.11)
T <sup>+</sup> T <sub>-1</sub> +T <sub>-2</sub>	-1.12 (0.716)	-0.931 (0.517)	0.723 (1.33)	0.0987 (0.0942)	1.27 (3.92)	-3.77 (1.78)
T <sup>+</sup> T <sub>-1</sub> +T <sub>-2</sub>	2.93 (3.53)	-0.470 (1.25)	-1.47 (2.80)	-0.403 (0.190)	21.1 (16.2)	5.63 (1.96)
Durbin-Watson statistic	2.34	1.96	2.16	2.43	2.36	1.71
$\bar{R}^2$	0.593	0.0547	0.422	0.464	0.661	0.750

See notes to Table 4.



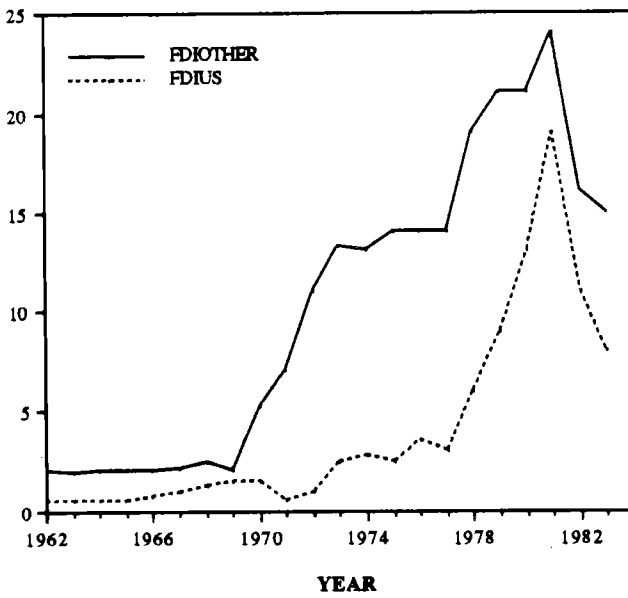
FIGURE 1

TOTAL FDI, RETAINED EARNINGS AND TRANSFERS AS A PERCENT OF U.S. GNP, 1953-87



**FIGURE 2**

**FDI to the U.S. and to the Rest of the World from Seven Countries (\$billions), 1962-83**



**FIGURE 3**  
**FDI in the U.S. as a Fraction of Worldwide FDI of Seven Countries, 1962-83**

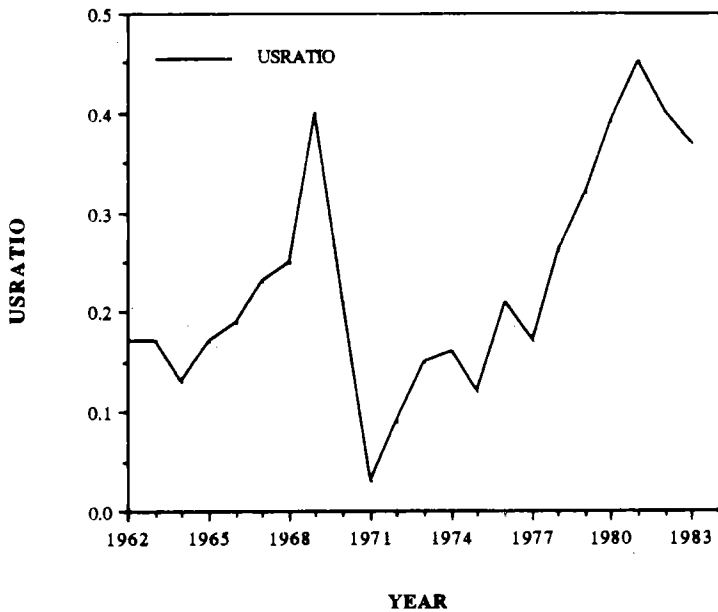


FIGURE 4A

FDI from Canada as a Percent of U.S. GNP

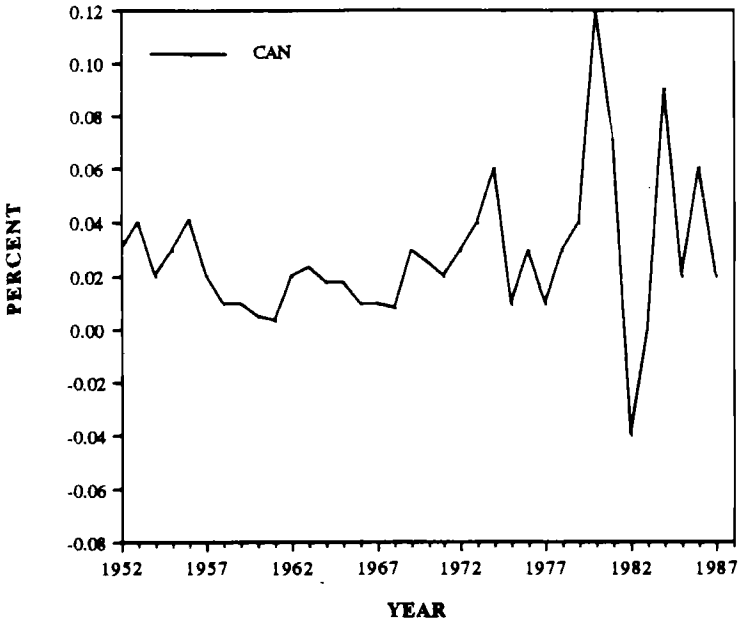
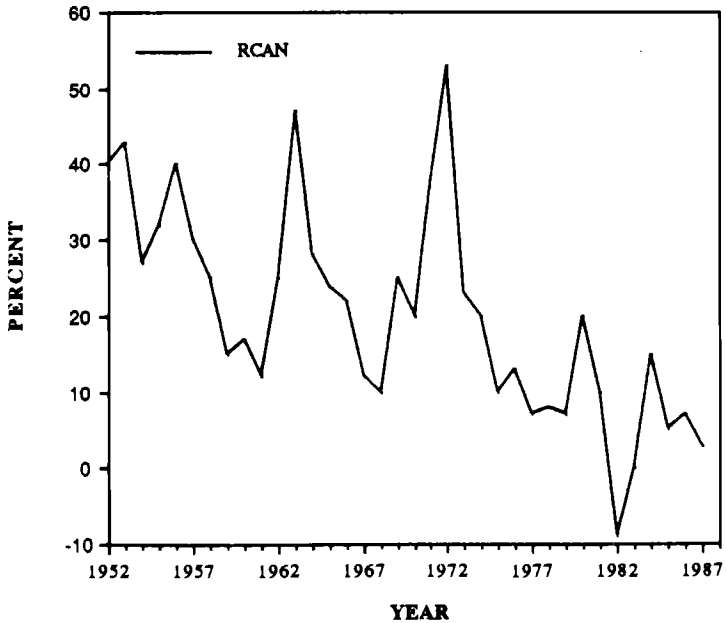
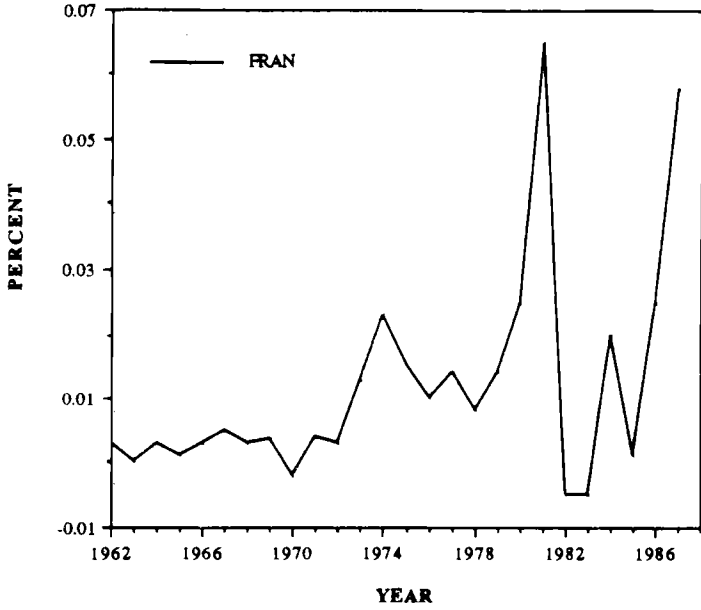


FIGURE 4B

FDI from Canada as a Percent of Total FDI in the U.S.



**FIGURE 5A**  
**FDI from France as a Percent of U.S. GNP**



**FIGURE 5B**  
**FDI from France as a Percent of Total FDI in the U.S.**

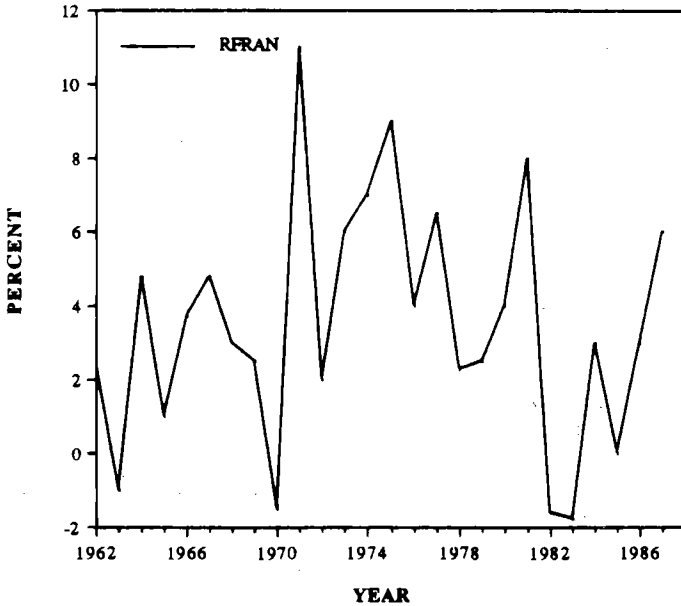


FIGURE 6A

FDI from Italy as a Percent of U.S. GNP

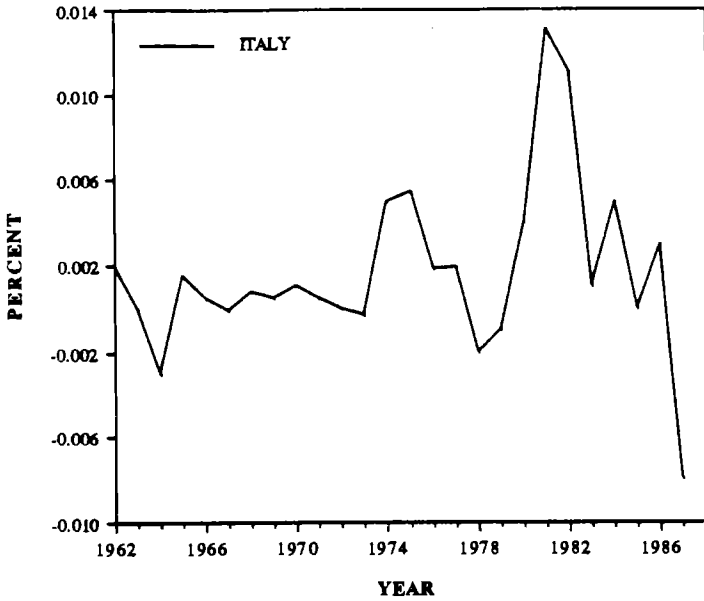
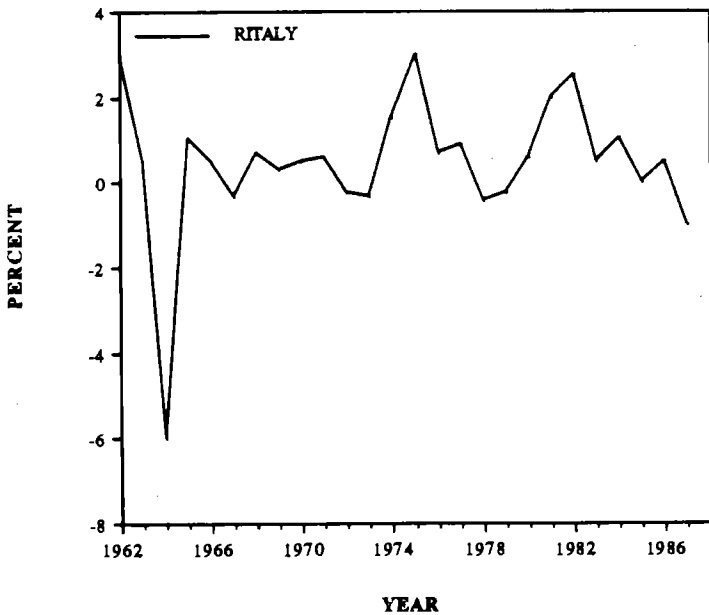
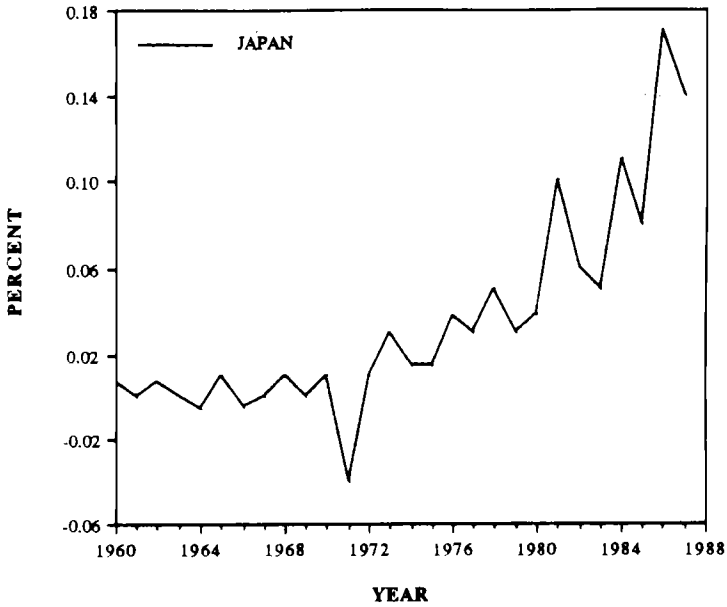


FIGURE 6B

FDI from Italy as a Percent of Total FDI in the U.S.



**FIGURE 7A**  
**FDI from Japan as a Percent of U.S. GNP**



**FIGURE 7B**  
**FDI from Japan as a Percent of Total FDI in the U.S.**

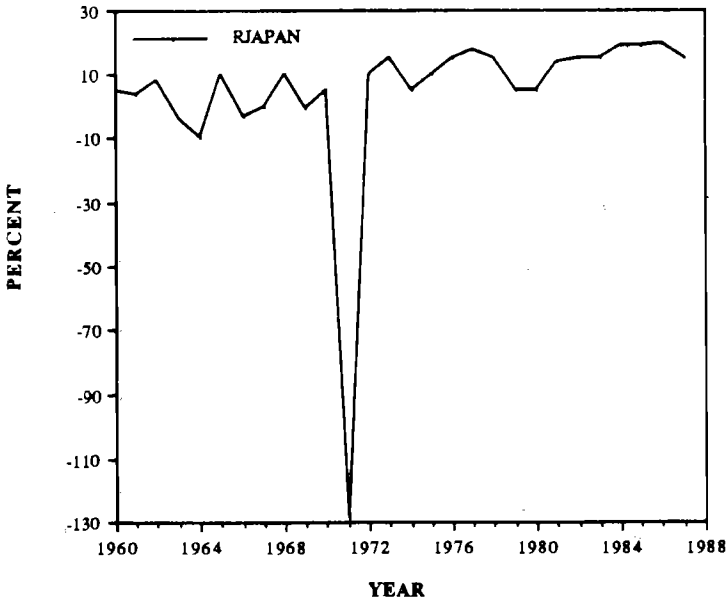


FIGURE 8A

FDI from the Netherlands as a Percent of U.S. GNP

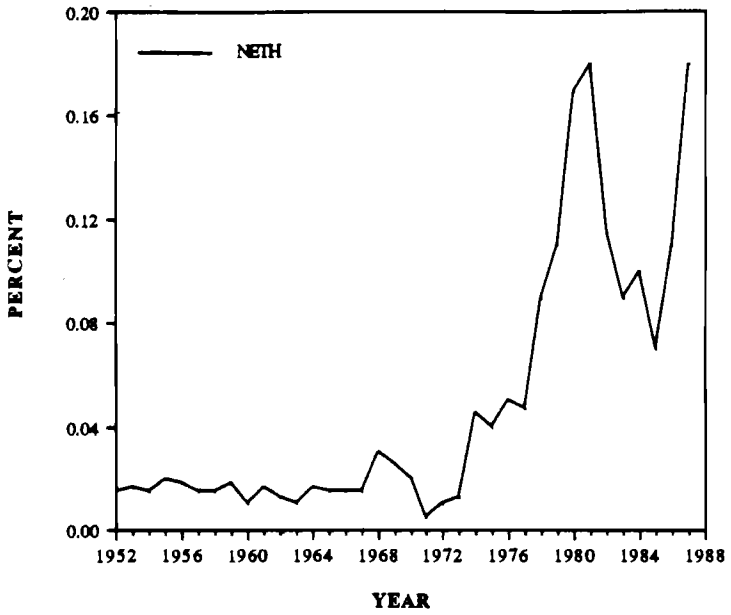


FIGURE 8B

FDI from the Netherlands as a Percent of Total FDI in the U.S.

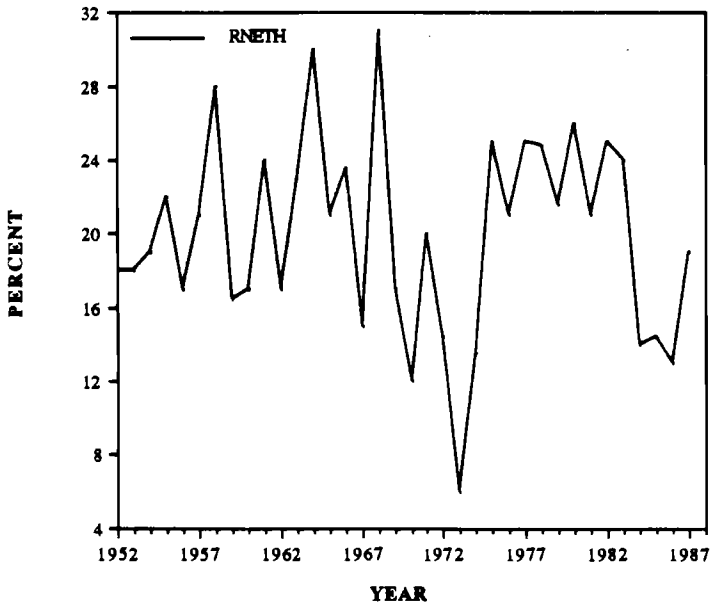




FIGURE 9A

FDI from the United Kingdom as a Percent of U.S. GNP

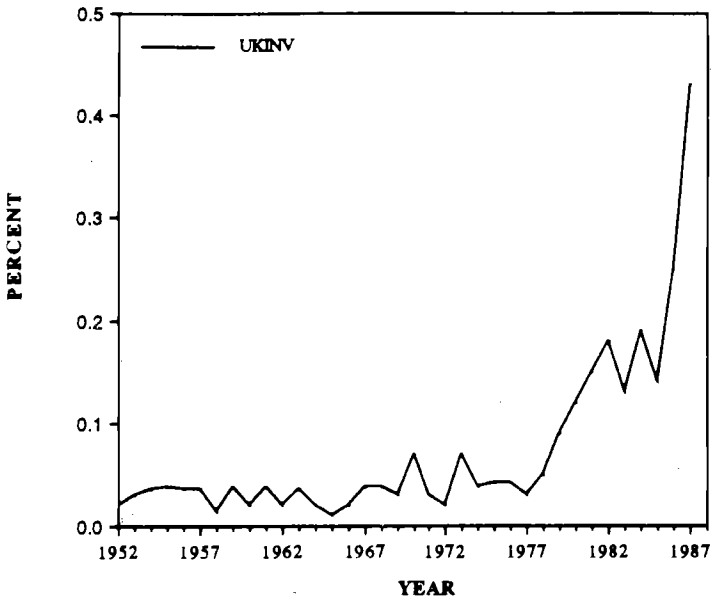


FIGURE 9B

FDI from the United Kingdom as a Percent of Total FDI in the U.S.

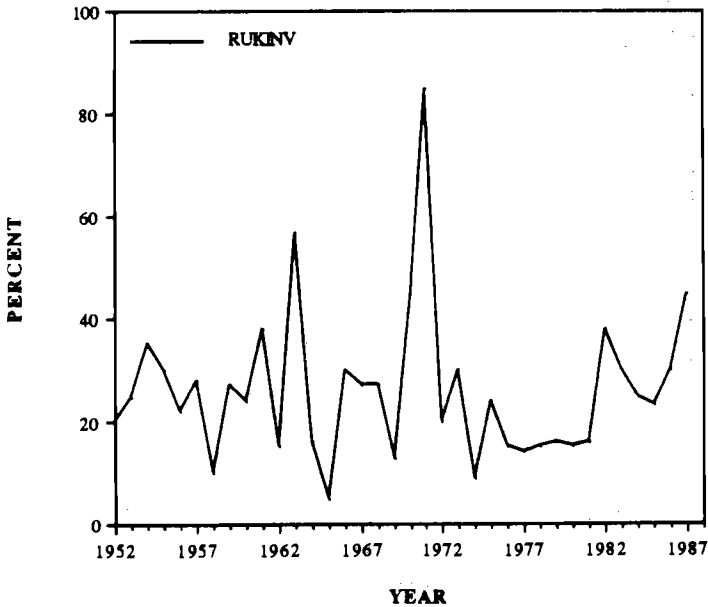


FIGURE 10A

FDI from West Germany as a Percent of U.S. GNP

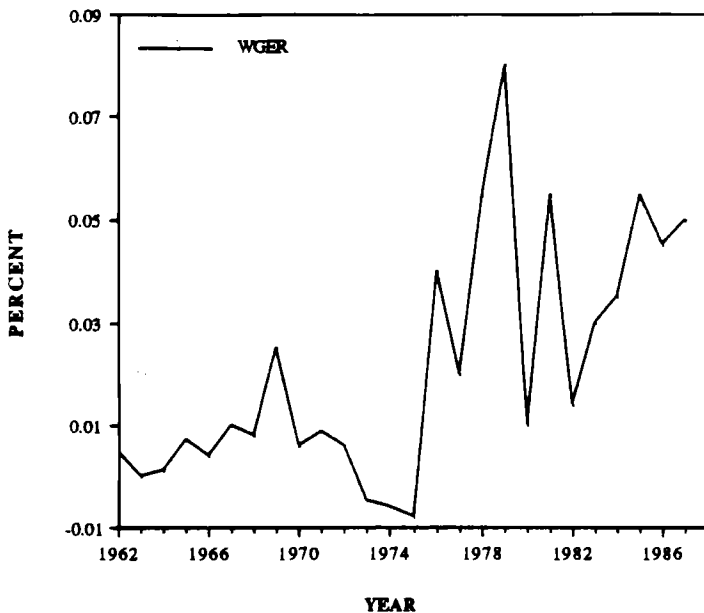
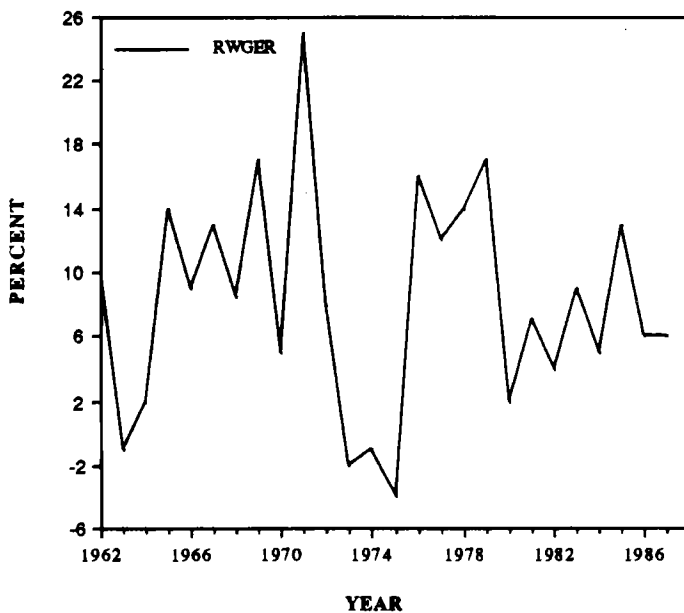


FIGURE 10B

FDI from West Germany as a Percent of Total FDI in the U.S.



APPENDIX: DATA DEFINITIONS AND SOURCES

1. Foreign Direct Investment. Taken from several issues of the Survey of Current Business. The most recent citation is August, 1988: "Foreign Direct Investment in the United States: Detail for Position and Balance of Payment Flows," Tables 12-19.
2. U.S. Marginal Effective Corporate Tax Rates ( $\tau$ ). Auerbch and Hines (1988), Table 1, Column 1. The 1987 tax rate is obtained by multiplying their 1986 figure by the ratio of the post-tax-reform and pre-tax-reform effective tax rates on capital in Fullerton and Karayannis (1987), Tables IV.5 and IV.6, Column 3.
3. Foreign Marginal Effective Tax Rates ( $T$ ). For France, Italy, the U.K. and West Germany, these are calculated from separate series on the effective tax rate equipment and structures provided by Julian Alworth. The overall effective tax rate is equal to  $[a_E t_E / (1 - t_E)] + [a_S t_S / (1 - t_S)] / [a_E / (1 - t_E) + a_S / (1 - t_S)]$ , where  $t_E$  and  $t_S$  are the effective tax rates on equipment and structures, respectively, and  $a_E$  and  $a_S$  are the fraction of the capital stock in equipment and structures, respectively. This formula is taken from King and Fullerton (1984). The value of  $a_E$  is set to be 0.585, and  $a_S$  to 0.415. This corresponds to the fraction of capital stock in equipment and structures, respectively, in manufacturing found by King and Fullerton for both the United Kingdom and West Germany, the only two European countries they investigate.

For Japan, the tax rate series is taken from Tajika and Yui (1988), Table 3, Column 4. These calculations include the effect of personal taxes. However, the personal tax parameters are either small in magnitude (the capital gains tax is zero) or unimportant (the tax on dividends is presumed to affect only the cost of capital financed by new share issues, which constitutes only 3.6% of total finance). The values for 1985 through 1987 are set equal to the 1984 rate.

For Canada, the tax rate series up to 1981 is from Boadway, Bruce and Mintz (1987), Table 3.3, Column 10. Comparable values for 1982 through 1987 were provided by Jack Mintz.

4. U.S. and Foreign Statutory Corporate Tax Rates. U.S. rate taken from Pechman (1987), Table A-8. Foreign rates taken from same sources as above. U.S. rate is federal only.
5. Relative GDP (RGDP). Up to 1985, real GDP for each country is calculated by multiplying real GDP per capita in current international prices by the population. The real GDP per capita and population measures are taken from the supplement in diskette to Summers and Heston (1988). Real GDP for 1986 for each country is calculated as the 1985 GDP calculated as above multiplied by one plus the rate of real growth as reported in OECD Main Economic Indicators (1988) pp. 37-41. 1987 real GDP is calculated in a similar manner.

6. U.S. Unemployment Rate (USUNEMP). U.S. unemployment rate for males 20 years and over taken from Economic Report of the President, 1988, Table B-39.
7. Foreign Unemployment Rate (FUNEMP). For each country, it is the unemployment rate for males ages 25 to 54 taken from OECD, Department of Economics and Statistics, Labor Force Statistics, (1966-1986), pp. 472-501 (and various back issues). The overall foreign unemployment rate is a weighted average of these rates, using 1975 real GDP's as the weights.
8. Real Exchange Rate (REXC). For each country, it is the product of the nominal exchange rate (foreign currency/US\$) and the ratio of GDP deflators (US GDP deflator/foreign GDP deflator). 1987 nominal exchange rates taken from OECD Main Economic Indicators, October 1988, p. 30. 1987 GDP deflators are calculated using the percentage change in GDP deflators from 1986 to 1987 in OECD Quarterly National Accounts (1st quarter 1988). The 1987 GDP deflator for the Netherlands was calculated using the percentage change in the CPI from OECD Main Economic Indicators, October 1988, p. 140. GDP deflators up to 1986 are from OECD National Accounts (1960-1986), Chart 31, pp. 138-9. Nominal exchange rates up to 1986 are taken from the same source, Chart 2, pp. 150-1.

The overall real exchange rate is calculated by setting real exchange rates in 1975 levels to one and then weighting the change from 1975 real exchange rate levels by their respective shares of real GDP in 1975.

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