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NEW RESULTS ON THE EFFECTS OF TAX POLICY ON THE INTERNATIONAL LOCATION OF INVESTMENT

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ABSTRACT

We study the effects of tax laws on foreign direct investment (FDI) and direct investment abroad (DIA), distinguishing in each case between investment financed by retained earnings and investment financed by transfers from abroad. We find that tax policy, through its effect on the rate-of-return available in the U.S., has an important effect on the international location of investment. FDI in the U.S. is very sensitive to after-tax rates-of-return available here. U.S. direct investment abroad is also affected, although to a lesser extent.

We use these estimates to examine the effects of the 1981-82 tax changes on the international location of investment. We estimate that the tax changes lowered annual DIA by \$0.5 billion to \$1.0 billion (2% to 4% of its 1980 value), and raised annual FDI by \$2 billion to \$4 billion (11% of 20% of its 1980 value). We also discuss the welfare effects of tax policy toward international investment.

Our results suggest that the tax effects on the international location of investment are important. Tax policies, such as ACRS and the ITC, which raise the after tax rate-of-return on new investment without losing revenue from previous investment, not only stimulate domestic fixed investment, but also attract additional investment from abroad. The additional investment supplements the domestic investment impact on productivity and raises corporate tax revenue. However, our results should be taken as preliminary estimates, not as definitive statements about the long-run impacts of tax policy.

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1. Introduction

Foreign direct investment (FDI) in the United States and U.S. direct investment abroad (DIA) are important economic phenomena as well as a source of political controversy. In 1980, FDI reached $17 billion, about 22% as large as net domestic fixed investment. Correspondingly, DIA reached $19 billion, about 25% as large as net domestic investment in plant and equipment. Since 1980, substantial FDI has continued, whereas DIA has fallen precipitously. Further, the sources of finance for FDI and the uses of earnings on DIA have changed dramatically in the past few years.

These flows -- in both directions -- have become a concern of tax policy. For example, the adoption of the Accelerated Cost Recovery System (ACRS) in 1981, as amended in 1982, was expressly limited to investment in the United States. While the primary motivation behind ACRS was to increase U.S. domestic capital formation, a secondary concern, evidenced in the hearings preceding its adoption, was to stem the flow of U.S. investment abroad. Further, FDI is often seen as an important justification for continuing the U.S. corporate income tax, even by those who favor corporate and personal tax integration. Another example of revenue (and perhaps location of investment) concern is the per country limitation to the foreign tax credit in the Administration's tax reform proposal.

Multinational firms undoubtedly invest outside their home country for a wide variety of reasons: access to markets, political considerations, labor costs, proximity to suppliers, and expected economic conditions, to name a few. Often, the reasons may be industry, firm, or even product-specific. Given these other forces shaping the international location of investment, however, tax laws potentially affect the attractiveness of U.S. direct investment abroad, and foreign direct investment in the U.S., as well as the repatriation of earnings and/or capital. The major changes in U.S. domestic investment incentives enacted in 1981 and 1982 (ERTA and TEFRA, respectively) combined with the trends in FDI and DIA, as well as current tax reform proposals which might affect tax rates on DIA and FDI substantially, lead us to reexamine the question of the extent to which tax policy appears to influence the international location of investment.

We begin in Section 2 with a brief literature review, focusing on the differing effects on the location of investment of tax policy toward domestic investment and toward foreign source income. The argument in Hartman (1981, 1984, 1985) -- that foreign investment financed by retained earnings should not be influenced by the (deferred) home country tax on foreign source income -- is presented and some caveats suggested.

Section 3 presents a description of recent trends in FDI and DIA, their sources of finance and their uses, as well as their industrial composition and origin or location, respectively. It also describes the data used in our study.

Section 4 presents our empirical results. First, for the period 1965-79, we compare our results using revised data to those of Hartman. The results are fairly robust to the data revisions. Next, for both FDI and DIA we use revised data on extended sample periods and several alternative functional forms and combinations of variables to test the impact of tax policy on FDI and DIA. We conclude that tax policy can have significant effects on the international location of investment. Our results are similar to the quantitative estimates in Hartman's several studies for some of the effects, but they are only about one-third to one-half as large for others, e.g., the impact of U.S. domestic tax policy on U.S. direct investment abroad.

Section 5 presents a brief summary and conclusion, including rough estimates of the likely impacts of recent tax policy and current proposals on the international location of investment, and an analysis of the welfare effects of taxation of FDI and DIA.

2. A Brief Review of the Literature

The effects of domestic tax policy on the international location of investment occur primarily through two channels: home country tax policy towards investment in the home country, and home country tax policy towards foreign source income.[1]

Domestic tax policy towards investments made in the home country affect both FDI in the home country and DIA by home country firms. This occurs because tax policy alters the relative rates-of-return available at home and abroad. Entrepreneurs investing capital will naturally be attracted to locations where the (risk-adjusted) rate-of-return is highest.[2] Of course, this channel hinges on the substitutability of foreign and domestic investment for a firm. However, the common conception of foreign and domestic investment as alternative methods of producing the same good and/or serving the same (geographic) market suggests that there is some substitution between locations of

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1. The home country is where the parent company is based.

2. Issues concerning risk adjustment are not addressed in this paper.

investment. Moreover, as discussed in Hartman (1981), if there are financial constraints on firms, there will be a clear tradeoff between foreign and domestic opertions. Thus, there are good theoretical reasons for domestic tax policy to affect both FDI and DIA through its effects on relative rates-of-return. Empirically, this view has been supported by results in Hartman (1981, 1984) and below.

The importance of taxes on foreign source income has long been a subject of debate. There are two major approaches to taxation of foreign source income. In the "territorial" approach, the company pays no home country taxes on foreign income. In the "residence" approach, the company does pay home country taxes, but often a credit or deduction is allowed for taxes paid in the host country. The United States taxes with the residence approach, but allows a credit for taxes paid to other countries.

Research in the 1960s and 1970s focused largely on the issue of "capital export neutrality," the equivalent tax treatment of the foreign and domestic returns of multinational companies. In this regard, it was argued that, under a residential system with a credit for foreign taxes, the ability to defer taxation on foreign source income conferred a tax advantage toward investment abroad.[3]

This view has been challenged by Hartman (1981, 1984, 1985). Hartman properly draws attention to the distinction between investment

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3. See Bergsten, Horst, and Moran (1978) or Caves (1982) for a review of this position.

financed out of retained earnings abroad and investment financed by transfers from home. If the subsidiary is investing out of retained earnings, the home country tax on foreign source income does not affect the marginal investment decision, because the repatriation of earnings, not the earnings themselves, are the tax base. The home country tax on foreign source income is unavoidable, and its present value does not depend on the length of deferral. Thus, the marginal investment decision for investment out of retained earnings should depend only on net returns available in the home country or the host country. Hartman calls this "capital import neutrality", i.e., the same tax rates influence the decisions of both U.S. firms in the U.S. and foreign firms in the U.S. that finance investment by retained earnings.[4]

For firms that finance foreign investment by transfers from home, the home country tax on foreign source income does matter because no foreign earnings have accrued and thus the tax on foreign source income is avoidable. One implication of this theory is that a foreign affiliate should never simultaneously repatriate earnings and draw funds from home, since this creates a completely avoidable tax liability. Hartman defines firms that finance foreign investment by retention of earnings as "mature" firms, those that finance investment by transfers

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4. However, even when the tax on foreign source income is not a concern, it is not the case that foreign firms in the U.S. respond to the same tax rates as do U.S. firms. Foreign firms care about the tax rate paid at the corporate level. U.S. firms should respond to the total effective tax rate. These rates are developed in Feldstein, Dicks-Mireaux, and Poterba (1983) and Feldstein and Jun (1986). They do not always move in tandem. Moreover, it would be easy to design policies that affect the rates differently, e.g., the current tax reform bill HR3838.

from home as "immature". He argues that a large part of U.S. DIA is undertaken by mature firms, since approximately 70% of DIA in 1975-79 was financed by retained earnings. Thus, he concludes, "the size of the U.S. tax burden on foreign source income should be irrelevant for investment decisions." (1985, p. 119)

Several caveats apply to this conclusion. First, it should be noted that neither we nor Hartman test this proposition. Second, in recent years DIA financed by retained earnings has risen while DIA has fallen, suggesting a re-examination of the issues. Third, domestic treatment of foreign source income will not matter for timing of repatriation only if the domestic tax rate is known and thought to be permanent. If major tax policy revisions occur frequently (as has in fact occurred), then a firm will have an incentive to wait for lower rates.

3. Data

A. Introduction

Foreign direct investment refers to the infusion of funds into a U.S. subsidiary by the foreign parent or the retention of earnings by that subsidiary. The Bureau of Economic Analysis defines a U.S. affiliate as "a U.S. business enterprise in which a foreign person owns or controls, directly or indirectly, at least 10% of the voting securities if an incorporated U.S. business enterprise or an equivalent interest if an unincorporated business enterprise."[5] U.S. direct investment abroad is defined equivalently for the foreign subsidiaries of U.S. parent companies.[6]

Two aspects of this definition merit comment. First, foreign direct investment and direct investment abroad are not necessarily the dominant aspects of international capital flows. As of end-of-year 1984, foreign direct investment in the U.S. accounted for approximately 18% of all foreign assets in the United States, while U.S. direct investment abroad represented 25% of U.S. assets abroad (Scholl (1985)).

Second, foreign direct investment is not the exact counterpart to domestic net investment figures. For example, inflows of funds (or retention of earnings) are not necessarily used to purchase real capital assets, so FDI may overstate real foreign net investment. On the other hand, U.S. borrowing by the U.S. subsidiary is not part of the calculation of FDI. Hartman (1984) suggests that it is reasonable to use FDI figures as net foreign investment. Hartman (1981) shows that an equivalent proposition also holds for U.S. direct investment abroad.

B. Trends

Summary data for foreign direct investment in the U.S. and U.S. direct investment abroad are presented in Tables 1, 2, and 3.

As shown in Table 1, foreign direct investment has grown 2000% in real terms from 1950 to 1984. Large swings characterize the last third

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5. Foreign Direct Investment in the United States, 1980, p. 1. A person is defined to include any individual, associated group, estate, trust, corporation or any government.

6. U.S. Direct Investment Abroad, 1977, p. 2.

of this period, with tremendous growth from 1977 to 1981, a collapse of 50% in 1982 and 1983, and a doubling in 1984. FDI figures are also large in relative terms. In every year since 1980, FDI has been more than 20% of U.S. nonresidential net investment in plant and equipment. This is especially noteworthy for 1984, because net investment in the U.S. rose by over 100% of its 1983 level. The composition of the sources of FDI has changed over time. Since 1977, the percentage of FDI financed by retained earnings has fallen substantially. This has occurred contemporaneously with the large rise in FDI documented in column 1, thus suggesting that investment financed by intercompany debt and equity flows has dominated FDI in recent years. Finally, column 4 shows that the reinvestment ratio for FDI income has also fallen since 1982, though it was relatively stable in earlier periods.

U.S. direct investment abroad, shown in Table 2, grew steadily through 1979, but has since collapsed, representing a large and continuing repatriation of funds to the U.S. Real DIA in 1984 is only 2% higher than it was in 1950. These notions are reinforced by examination of DIA as a percentage of U.S. nonresidential net investment. DIA was consistently 20% or more of net investment in the 1960s and 1970s but has collapsed to 11% or less since 1981. The composition of DIA finance, shown in column 3, has undergone extreme gyrations in recent years. Nevertheless, the reinvestment ratio for DIA income has remained relatively stable.

Table 3 provides a snapshot of the level and composition of the U.S. positions in FDI and DIA as of the end of 1984. Both FDI and DIA have accummulated substantial positions. Approximately one-third of the FDI position is in manufacturing and one-sixth in petroleum. These two industries also account for 40% and 25% of the DIA position, respectively. Not surprisingly, European countries account for the largest share of both positions. Although Japan accounts for only 9.3% of the FDI position, it should be noted that this figure has risen from 2.1% in 1975 and 6.4% in 1979. Moreover, as noted above, capital inflows may occur predominantly in forms other than FDI.

Thus, even a cursory examination of the data suggests that both FDI and DIA can be substantial. The wide swings suggest further that international investment flows may be very sensitive to current or anticipated conditions. Before proceeding to a more formal analysis, however, issues concerning the data should be noted.

C. Sources

All data in FDI and DIA have been obtained from either Selected Data on Foreign Direct Investment in the U.S., 1950-79; Selected Data on U.S. Direct Investment Abroad, 1950-76; or the annual surveys of these topics in the Survey of Current Business, all of which are publications of the Bureau of Economic Analysis (BEA).

BEA develops these series by conducting occasional "benchmark" surveys of virtually all firms involved in FDI or DIA. They construct between year data by conducting annual sample surveys and extrapolating the total figures based on the firms in the sample surveys and the previous benchmark survey. Thus, as the time since the latest benchmark survey increases, the chance of mis-estimation would seem to increase. BEA conducted DIA benchmark surveys in 1966, 1977, and 1982. FDI surveys were undertaken in 1974 and 1980.

The 1980 FDI survey in particular generated substantial revisions in data for 1980 and later dates. For example, the direct investment position in FDI was revised upward by 21%, capital inflows (i.e., foreign direct investment) were revised upward by 24%, and FDI income was revised downward by 9% (Belli, 1984). With these revised data for 1980, the direct investment position rose 52% from its 1979 value, and FDI was 42% higher than in 1979. Note that BEA did not revise the data from the 1970s based on the 1980 benchmark survey.

There is reason to believe that a substantial part of the abrupt jumps in these series is due to underreporting during the 1970s. Specifically, BEA estimates that about 75% of the revision in the capital inflows figure was accounted for by affiliates that <u>should have reported</u> in the annual sample surveys but did not.[7]

One additional concern is that through 1979 BEA collected retained earnings for incorporated affiliates only. In 1980, unincorporated affiliates began to report retained earnings too. Thus, the series "investment financed by retained earnings" (I_{re} below) refers to incorporated affiliates only through 1979, and all affiliates in 1980 and thereafter. BEA presented separate data for incorporated and unincorporated affiliates for 1980-83, but has since discontinued the practice.

To account for the problems with the data discussed above, we have

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7. Belli, p. 34. BEA estimates that all of the revision in capital inflows was due to underreporting, but 25% of the underreporting was by exempt affiliates. For the direct investment position, two-thirds of the upward revision was due to underreporting, one-third due to revision or correction in the sample data. BEA does not state what part of the underreporting of direct investment position should have been reported, but if (as for capital inflows) 75% of the underreporting should have been reported, then one-half (2/3 x 3/4) of the upward revision in direct investment position should have been reported in the sample survey. This suggests that the position in FDI was also substantially underreported in the 1970s.

conducted a variety of alternative specifications. The alternatives are discussed with other regression results in Section 4.

All tax rate and rate-of-return data have been generously supplied by Martin Feldstein and Joosung Jun (1986). Data on U.S. gross national product, actual and middle cycle expansion path, have been taken from the Economic Report of the President, 1985 and de Leeuw and Holloway (1983). Data concerning gross domestic product in OECD countries were obtained from National Accounts of OECD Countries, 1950-68 and 1950-78, and OECD Main Economic Indicators in recent years.

4. Results

Table 4A presents FDI equations for 1965-79 estimated by us and Hartman (1984). The data that Hartman used were presented in an Appendix to that article. Our results use a revised tax rate and rate-of-return series presented in Feldstein and Jun (1986). Our results with the original data are very close to Hartman's. With the revised data, our estimates of the effects of taxes and rates-of-return are still similar to Hartman's especially for the retained earnings equations. For the equations examining I_{re}, our estimates show a decline in the elasticities with respect to foreigners' net return in the U.S., to 0.9 from 1.2 in the I_{re}/Y equation, and to 0.8 from 1.0 in the retention ratio equation. We also find a lower elasticity for the relative tax term.[8] None of the point estimates changes by more

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8. The relative tax term is meant to capture differences between domestic saving incentives and investment incentives. Thus, a savings incentive that lowered t' but not t would then increase savings, lower the pre-tax rate of return and thus lead to a fall in FDI.

than one standard deviation. We are thus heartened by the stability of the major qualitative conclusions and quantitative results for the I_{re} equations. The results hold up well with either the original or revised data. The I_t/Y equations seem to be slightly more sensitive to the data revisions. The t-statistics and relative magnitudes of the coefficients do remain stable, though.

In Table 4B, we present basic results for DIA in the 1965-79 period. Here, the data revisions have no effect on the sensitivity of DIA to its own rate-of-return. The effect is quite strong (the elasticity calculated at mean values is approximately 1.4) and statistically significant. Our estimates of the response of DIA to the net return in the U.S., however, are approximately one-third the size of Hartman's. (We estimate an elasticity of 0.2, compared to Hartman's 0.66). Our estimates, like Hartman's, found that the after-tax return is the relevant measure; the coefficients on gross return are equal and opposite in sign to the coefficients on gross return times the total effective tax rate. As with the net return, Hartman's coefficients are three times as large as ours. These basic equations appear to fit the data well. Nevertheless, the data revisions seem to have an important effect on the sensitivity of DIA to variations in the net-of-tax return in the U.S.

In summary, except for the I_t/Y equation for FDI and the elasticity of DIA with repect to net return in the U.S., we obtain results very similar to Hartman (1981, 1984), even with revised tax rate and rate-of-return data.

A. <u>New Results for Foreign Direct Investment</u>

Tables 5A and 5B present new results for FDI. In these equations we extend the sample forward to 1984, and in some cases backward to 1956, use the revised series mentioned above, and experiment with a variety of alternative explanatory variables and functional forms. Estimates can vary substantially depending on the assumptions made.

Table 5A presents regressions explaining the log of various foreign direct investment rates. The second equation shows typical results for the addition of alternative explanatory variables. In short, the basic rate-of-return and tax variables seem to contain most of the explanatory power.

For 1965-84, the elasticity of (I_{re}/Y) is estimated to be 1.0 with respect to its own rate of return, 1.9 with respect to the average foreigners' net return in the U.S., and -2.9 with respect to the relative tax term. Compared to results for 1965-79, the estimates in column 2 show a smaller response to return on FDI, and a much larger response to foreigners net return in the U.S. and relative taxes.

Results are presented for the 1956-84 period, too, in order to demonstrate the sensitivity to sample period. These results imply smaller elasticities than the results for 1965-79 or 1965-84.

The retention ratio is modelled in columns 3 and 4. We found elasticities for 1956-84 and 1965-84 that bracket the 1965-79 estimates for foreigners' net return in the U.S. and relative tax rates. In each case the elasticity for 1965-84 is largest. The estimates show a considerable degree of variation. For the return on FDI, the 1965-79 estimates show the largest elasticity.

The equations modelling investment financed by transfers fit poorly, as was the case in the 1965-79 sample period. Various modifications, including the addition of output variables, dummies for various periods and alternative functional forms do not alter this result.

Turning to other functional forms, Table 5B presents results for linear equations in the rate and level of the variables used in Table 5A. In general, these equations do not perform as well as the logarithmic equations. The coefficients have the correct signs and take on reasonable values. Using mean values over the sample period, the elasticity of I_{re}/Y with respect to the return on FDI is 2.0, with respect to foreigners' net return in the U.S. is 0.8, and with respect to the relative tax term is -2.0. Correspondingly, for the retention ratio, the elasticities for the 1965-84 period are 1.0, 2.3, -4.2, respectively. Columns 2 and 3 show that, again, regressions extending backward to 1956 do not perform as well. These coefficients imply elasticities ranging from 0.5 to 1.5 for foreigners' net return in the U.S., 0.6 to 0.7 for return on FDI, and -1.4 to -2.9 for relative taxes.

We also employed several alternative specifications including a dummy variable to capture the negative I_{re} in 1982, instrumental variables to account for potential endogeneity of the return on FDI, expanding the values of FDI (by 20%) in the late 1970's to proxy for the underreporting discussed in section 3, and alternative output terms. The overriding result of these alternative specifications is, as the Tables above would suggest, that the estimates are fairly sensitive to the specifications made.

B. New Results for Direct Investment Abroad

Table 6 presents some basic extensions of the DIA results given in Table 4B. The results are presented only for I^*_{re}/Y as the other two equations fit poorly over the entire period. The I^*_{re} equations, in rates and level, tend to confirm strongly our earlier estimates, from Table 4B. In particular, the net return in the U.S. enters with an elasticity of approximately -0.2 in each specification, while the net return abroad has an elasticity estimated at 1.2 to 1.3. Alternative specifications led to varying results, and are not reported here.

In summary, our empirical research supports the notion that domestic tax policy can have a significant impact on DIA and FDI. Our results are similar to Hartman's for 1965-79, although our elasticity estimates are somewhat smaller for the response of DIA to a change in net returns in the U.S. and for the response of FDI to changes in the return on FDI.

5. Summary and Implications

We have presented above new evidence that U.S. domestic tax policy affects the international location of investment. While the results are somewhat sensitive to sample period, functional form and other considerations, the qualitative conclusions tend to hold up well. Of particular interest are two empirical issues - the likely impact of the 1981-82 corporate tax changes on FDI and DIA and the corresponding potential effects of any corporate tax reform. Also important are the welfare aspects of international location of investment.

Our estimates of the impact on DIA of changes in the after-tax rate-of-return in the U.S. suggest that a reduction of approximately four cents of DIA occurs for every dollar of increased U.S. domestic investment. This estimate derives from a comparison of analogous coefficients on domestic investment equations estimated by Feldstein and Jun (1986)[9] This refers only to investment out of retained

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9. This estimate is obtained as follows. Feldstein and Jun (1986) regress net investment divided by GNP on several variables, including the (lagged) overall net rate-of-return. Their coefficient on the rate-of-

earnings. It is likely that transfers from domestic parent companies to foreign subsidiaries, or the establishment of such subsidiaries, is also responsive to domestic tax policy, but the data are insufficient to reach any specific conclusions on the matter.

We estimate that a tax policy which raises the after-tax rate of return enough to lead to a dollar of increased domestic investment in the U.S. brings with it between eight and twenty-seven cents of FDI.[10] These results are consistent with those found in Hartman (1981, 1984).

Several studies have attempted to study the effect of the 1981-82 investment incentives on effective marginal tax rates (e.g., see Auerbach (1983), Feldstein and Jun (1986), Gravelle (1983), and Hulten and Robertson (1983). These studies generally find that the effective corporate tax rate was reduced by about 20% to 35%.[11] With a constant before-tax rate-of-return and a pre-ERTA effective tax rate of about 33%, the tax changes increased foreigners' average net return in the U.S. by 10% to 17%. Other things equal, our estimates suggest that

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return variable is .459. When our equations are transformed into the appropriate units (i.e., when coefficients are divided by 1000; see note in Table 6), our estimate of the effect of net rate-of-return in the U.S. on U.S. Direct Investment Abroad is -.016, which is about 4% as large (in absolute value) as .459.

10. This is obtained by multiplying the elasticity of I_{re}/Y with respect to Foreigners' net return in the U.S. (shown in columns 1 and 2, Table 5A) by the average value of foreigners' net return in the U.S. (.054) and dividing by the average of the (transformed) I_{re}/Y (.00355).

11. Studies differ in their estimates because of differing assumptions about expected inflation, discount rates, debt/equity ratios, and hurdle rates, among other things.

this change in net return would bring about approximately a 2% to 4% decline in DIA and an 11% to 20% rise in FDI. This would imply capital inflows of about $0.5 billion to $1.0 billion from smaller DIA and $2 billion to $4 billion in increased FDI. Of course, these figures refer to FDI and DIA out of retained earnings only. Likewise, a tax reform such as H.R.3838, which raises (except perhaps at very high inflation rates) the effective tax rate on U.S. corporate investment, would result in an increase in direct investment abroad by U.S. firms and a decrease in foreign direct investment in the U.S. However, because these results contain no long term dynamic theory of the optimal international location of investment, they should not be taken as any final guide to the impacts of these tax changes on investment patterns.

Finally, the welfare economics of the international location of investment, described in Caves (1982), Goulder, Shoven, and Whalley (1983), and Hartman (1984) should be addressed. Domestic economic welfare rises with FDI because the U.S. receives a claim on the rate-of-return to foreign capital through the taxation of FDI income. Conversely, domestic economic welfare falls when U.S. firms substitute DIA for investment at home,[12] because the nation then receives only the net-of-foreign-tax return (and that only when it is repatriated) rather than the gross return. These welfare effects are augmented by the beneficial effects on labor productivity of greater investment - foreign or domestic - in the United States. Thus, a reduction in

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12. Of course, not all DIA comes at the expense of domestic investment.

taxation of new corporate investment improves welfare through three channels: the standard mechanism, through which lowering the effective marginal tax rate generates new domestic investment opportunities for U.S. firms; a reallocation of the location of investment by U.S. firms toward home and away from abroad; and an increase in FDI. In this paper, we have presented some new evidence that these last two effects are quantitatively important and therefore that it is necessary to consider them in any evaluation of domestic investment incentives.

The welfare effects of tax policy clearly depend on the responsiveness of FDI and DIA to net-of-tax returns. The welfare gains to a tax reduction confined to new corporate investment are positively linked to the responsiveness of DIA and negatively linked to the responsiveness of FDI with respect to net-of-tax returns in the U.S.

Our results suggest that accelerated depreciation or tax credits for new investment which decrease the effective marginal tax rate paid at the corporate level by 10% would, through its effect on the net-of-return available to FDI, raise FDI by 9%. Corporate tax revenues from taxation of FDI could be expected to rise correspondinly. Similar, though smaller, revenue effects would occur for DIA. These results refer to investment financed by retained earnings only. Note, however, that tax revenue is greater per dollar of potential DIA diverted to domestic investment than per dollar of FDI, because foreign owners of U.S. capital pay taxes only at the corporate level, while domestic owners are also responsible for state, local, and personal taxes.

Our results suggest that the tax effects on the international location of investment are important. Tax policies, such as ACRS and ITC, which raise the after tax rate-of-return on new investment without losing revenue from previous investment, not only stimulate domestic fixed investment, but also attract additional investment from abroad. The additional investment supplements the domestic investment impact on productivity and raises corporate tax revenue. However, our results should be taken as preliminary estimates, not as definitive statements about the long-run impacts of tax policy.

Table 1
Selected Data on Foreign Direct Investment in the United States, 1950-1984

Year	FDI (current $ millions)	FDI as a % of Non-residential Net Investment	% of FDI Financed by Retained Earnings[a]	Reinvestment Ratio for FDI Income[b]
1950	$270	2.8%	70.4%	52.9%
1960	315	2.6	55.2	44.2
1970	1,464	4.3	29.6	49.6
1971	367	1.2	147.7	46.6
1972	949	2.5	60.0	44.3
1973	2,800	5.3	32.5	56.6
1974	4,760	9.6	22.4	80.0
1975	2,603	8.5	45.7	53.3
1976	4,346	12.6	38.2	53.3
1977	3,728	7.3	42.5	55.9
1978	7,896	10.7	32.7	61.3
1979	11,876	13.3	33.3	62.2
1980	16,918	21.9	30.6	60.0
1981	25,195	27.8	11.7	43.8
1982	13,792	22.5	-17.2	-75.4
1983	11,946	24.0	0.7	1.6
1984	22,514	21.0	16.5	36.5

Source: Foreign Direct Investment and its components: Selected Data on Foreign Direct Investment in the U.S., 1950-79, and various issues of Survey of Current Business. Non-residential Net Investment: Economic Report of the President, 1985, Table B-15, p. 250. Values of GNP deflator are 1950:53.56, 1960:68.70, 1970:91.45, 1980:178.42, 1984:223.38.

Notes:

a. Foreign Direct Investment is financed either by retention of earnings or by intercompany flows of equity or debt. Retained earnings are negative when dividend payments to equity holders are larger than earnings. Intercompany flows are net figures and are negative when more funds flow out of the U.S. subsidary than into it. Thus, the ratio listed above may be greater than 100% or less than 0. In 1982, retained earnings were negative.

b. This ratio measures FDI financed by retained earnings divided by FDI income. It can be negative for the reasons stated in note a.

Table 2
Selected Data on Direct Investment Abroad by U.S. Firms, 1950-1984

Year	DIA (current $ millions)	DIA as a % of Non-Residential Net Investment	% of DIA Financed by Retained Earnings[a]	Reinvestment Ratios for DIA Income[b]
1950	$1,096	11.4%	43.3%	26.8%
1960	2,941	23.9	43.0	35.0
1970	7,589	22.3	41.8	38.9
1971	7,617	24.4	41.7	34.7
1972	7,746	20.9	58.5	41.4
1973	11,353	21.8	71.8	49.3
1974	9,052	18.4	85.9	40.6
1975	14,244	47.0	56.5	48.5
1976	11,949	34.8	64.4	40.5
1977	11,893	23.5	53.8	32.5
1978	16,056	21.8	70.6	44.6
1979	25,222	28.4	75.2	49.7
1980	19,222	24.9	88.5	45.8
1981	9,624	10.6	140.1	41.6
1982	-4,424	-7.2	-151.6	29.7
1983	5,394	10.8	178.0	45.1
1984	4,503	4.2	243.5	47.5

Source: Direct Investment Abroad and its components: Selected Data on U.S. Direct Investment Abroad 1950-76, and various issues of Survey of Current Business.

Notes:

a. See note a, Table 1. In 1982, DIA financed by retained earnings was positive, but DIA financed by transfers was negative and larger in absolute value.

b. See note b, Table 1.

Table 3
U.S. Direct Investment Positions, 1984
($ millions)

Position	Foreign Direct Investment	Direct Investment Abroad
Total	159,571	233,412
By Industry:		
Petroleum	24,916	63,319
Manufacturing	50,664	93,012
Wholesale Trade	24,042	-
Other	59,949	77,081
By Political Unit:		
Canada	14,001	50,467
Europe	106,567	103,663
Japan	14,817	8,374
Other	24,187	70,908

Source: Survey of Current Business, August, 1985, pp. 30,36,47.

Table 4A
Comparison of Basic Results for Foreign Direct Investment, 1965-79

Dependent Variable	$\ln(I_{re}/Y)$[a]	$\ln(I_{re}/Y)$[a]	$\ln(I_{re}/E)$[b]	$\ln(I_{re}/E)$[b]	$\ln(I_t/Y)$[c]	$\ln(I_t/Y)$[c]
	Hartman	Boskin/Gale[d]	Hartman	Boskin/Gale	Hartman	Boskin/Gale
Coefficient (s.e.) on						
constant	-6.573 (.679)	5.217 (1.102)	2.386 (.679)	1.932 (.751)	8.535 (1.635)	4.698 (2.604)
ln(return on FDI)[e]	1.436 (.118)	1.443 (.113)	.275 (.087)	.306 (.091)	.552 (.284)	.536 (.314)
ln(Foreigners' net return in U.S.)[f]	1.232 (.376)	.879 (.341)	1.045 (.277)	.810 (.232)	1.674 (.905)	1.096 (.806)
ln(relative tax term)[g]	-1.720 (.415)	-1.382 (.393)	-1.602 (.306)	-1.397 (.267)	-2.329 (.998)	-1.763 (.928)
Standard error of regression	.096	.117	.071	.070	.590	.244
Adjusted R^2	.940	.931	.750	.753	.286	.205
Durbin-Watson	1.67	1.54	2.26	2.32	1.92	1.87

Source: All data are provided in Hartman (1984). A revised series for tax rates and rates-of-return have been supplied by Martin Feldstein and Joosung Jun (1986).
Notes:
a. I_{re} is Foreign Direct Investment financed by retained earnings.This series is multiplied by 1000 and divided by GNP to obtain I_{re}/Y.
b. E represents income from Foreign Direct Investment. Income = earnings + interest(net of witholding taxes) - withholding taxes on distributed earnings.
c. I_t refers to investment financed by transfers of funds into the country. This series is also multiplied by 1000 and divided by GNP. Moreover, since I_t is negative in 1971, Hartman adds 1.676 billion to I_t before transforming. To allow comparability, we add this constant too.
d. Our results use the updated series provided by Feldstein and Jun. Our estimates using the data presented in Hartman (1984) are very close to our results in this table.
e. Return on FDI is calculated as income from Foreign Direct Investment divided by end-of-year Direct Investment Position (in FDI) for the previous year.
f. Foreigners' return in the U.S. is defined as the overall gross-rate of return times one minus the tax rate paid at the corporate level.
g. The relative tax term = (1-t')/(1-t), where t' = the total effective tax rate, t = tax rate paid at the corporate level.

Table 4B
Comparison of Basic Results for Direct Investment Abroad, 1965-79

Dependent Variable	$(I_{re}/Y)^a$	$(I_{re}/Y)^a$	$(I_{re}/Y)^a$	$(I_{re}/Y)^a$
	Hartman	Boskin/Gale	Hartman	Boskin/Gale
Coefficient (s.e.) on				
constant	.003736 (.000489)	-.000994 (.000898)	.003681 (.001758)	-.001257 (.002060)
Net return[b] in U.S.	-.0671 (.0080)	-.0207 (.0102)	-	-
Return on DIA[c]	.0412 (.0045)	.0404 (.0039)	.0411 (.0048)	.0407 (.0045)
Gross return in U.S.	- -	- -	-.0674 (.0138)	-.0224 (.0157)
Gross return x effective tax rate	- -	- -	.0684 (.0420)	.0267 (.0431)
Dummy for 1974	-.00186 (.00049)	.000991 (.000475)	-.00188 (.00064)	-.00105 (.00064)
Standard error of regression	.000405	.000399	.000424	.000418
Adusted R^2	.937	.941	.931	.954
Durbin-Watson	2.15	1.82	2.15	1.82

Source: Hartman (1981).
Notes:
a. Defined as Direct Investment Abroad financed by retained earnings divided by U.S. GNP.
b. Defined as overall gross rate of return times one minus the total effective tax rate.
c. Defined as income from Direct Investment Abroad divided by the end-of-year Direct Investment Position (in DIA) for the previous year.

Table 5A
New Results for Foreign Direct Investment

Dependent Variable	$\ln(I_{re}/Y)$[a]	$\ln(I_{re}/Y)$[a]	$\ln(I_{re}/E)$[a]	$\ln(I_{re}/E)$[a]	$\ln(I_t/Y)$[b]
Sample Period	1956-84	1965-84	1956-84	1965-84	1956-84
Coefficient (s.e.) on					
constant	4.894 (1.082)	11.848 (3.764)	2.644 (1.535)	3.968 (1.330)	.533 (1.175)
ln(return on FDI)	.978 (.130)	1.039 (.185)	.193 (.133)	.228 (.135)	.041 (.179)
ln(Foreigners' net return in U.S.)	.400 (.323)	1.906 (.643)	.475 (.331)	1.121 (.415)	-.214 (.435)
ln(relative tax term)	-.979 (.353)	-2.895 (1.265)	-1.107 (.361)	-1.633 (.411)	-.537 (.486)
Dummy for 1980's	- -	.242 (.237)	- -	- -	- -
Adjusted U.S. GNP[c]	- -	-2.713 (2.806)	- -	- -	- -
Adjusted OECD GDP[d]	-	-.903 (.879)	-	-	-
Dummy for 1974	-	-.509 (.629)	-	-	-
Standard Error of Regression	.202	.192	.209	.205	.262
Adjusted R^2	.727	.831	.345	.542	.218
Durbin-Watson	2.26	2.36	1.98	1.90	2.00

Sources: Middle Expansion Trend GNP: de Leeuw and Holloway (1983), and subsequent issues of Survey of Current Business. OECD data: National Accounts of OECD Countries, 1950-68 and 1950-79, and OECD Main Economic Indicators in subsequent years.

Notes:

a. Because I_{re} is negative in 1982, a constant was added to (I_{re} x 1000)/GNP before taking logarithms. The constant = 3,880, chosen such that the minimum (transformed) observation was roughly equivalent to the minimum (transformed) observation for I_t.

b. This variable is as defined on Table 4A.

c. Measured as U.S. GNP divided by middle expansion trend U.S. GNP.

d. Measured (GDP of all OECD countries - U.S. GDP), divided by its linear trend value.

Table 5B
New Results for Foreign Direct Investment[a]

Dependent Variable	(I_{re}/Y)	(I_{re}/E)	(I_{re}/E)	(I_{re}/E)	(I_{re})
Sample Period	1956-84	1956-84	1956-84	1965-84	1956-84
Coefficient (s.e.) on					
constant	.119 (.441)	.764 (.384)	.512 (.339)	.867 (.220)	-371 (1762)
Return on FDI	14.506 (1.891)	4.026 (1.659)	3.495 (1.320)	4.960 (.865)	10151 (5334)
Foreigners' return in U.S.	9.106 (6.237)	13.029 (5.178)	4.730 (3.633)	18.646 (2.339)	25035 (14754)
Relative tax term	-1.737 (.717)	-1.879 (.645)	-.754 (.542)	-2.747 (.349)	-4809 (1536)
Dummy for 1980's	.287 (.165)	- -	-.329 (.094)	- -	- -
Income from FDI	-	-	-	-	.718 (.089)
Standard Error Regression	.224	.196	.183	.136	449
Adjusted R^2	.714	.362	.566	.884	.904
Durbin-Watson	1.85	2.18	2.01	2.30	2.18

Notes:
a. All variables have been defined in Table 4A.

Table 6

New Results for Direct Investment Abroad

Dependent Variable	$\ln(I^*_{re}/Y)$[a]	(I^*_{re}/Y)
Sample Period	1965-84	1965-84
Coefficient (s.e.) on		
constant	3.070 (.619)	-.670 (.730)
Net return in U.S.[b]	-.196 (.103)	-15.95 (8.71)
Return on DIA[b]	1.219 (.163)	37.11 (3.33)
Standard Error of Regression	.146	.047
Adjusted R^2	.900	.938
Durbin-Watson	1.62	1.76

Notes:
a. (I^*_{re}/Y) is DIA financed by retained earnings x 1000 divided by GNP.
b. See Table 4B for definition.

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