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An Empirical Assessment of the Impact of Host Country and Home Country Corporate Tax Rates on Foreign Direct Investment in the United States

Albert Wijeweera, Brian Dollery and Don Clark **

Abstract

A significant research effort has been directed at establishing the determinants of foreign direct investment (FDI), with taxation policy identified as an important factor. However, the empirical literature has been limited in several respects, with most work focused exclusively on host country tax regimes. This paper seeks to extend the boundaries of FDI empirical inquiry by using a panel of nine investing tax exemption and tax credit countries over the period 1982-2000, constituting more than 85 percent of total US FDI inflows, and incorporating home country tax rates to analyze two as yet unanswered questions. Firstly, are corporate income tax rates an important determinant of FDI in the US? Secondly, do investors from tax credit countries differ significantly in their tax response relative to those from tax exemption countries?

JEL Classification: F21; F14; F13

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1. Introduction

Unprecedented growth in foreign direct investment (FDI) in the United States has ignited a substantial research effort aimed at identifying the determinants of this massive influx of investment finance (Mooji and Ederveen, 2001). Taxation policy has long been recognized as a crucial factor in US-bound FDI (Hartman, 1984). This paper seeks to investigate the combined effects of host-country and home-country tax regimes on the magnitude of inbound foreign direct investment (FDI) in the US.

Although several studies have investigated the impact of corporate tax rates on FDI flows, they have largely ignored home-country tax rates (see, for example, Hartman, 1984, and Young, 1988)). However, importance of home-country taxation rates has become increasingly significant given intense global rivalry in international tax competition. Competitive tax-cutting has become especially acute amongst industrialized countries. For instance, while not a single OECD country raised its corporate income tax rates in 2001, twelve members actually cut their rates (KPMG, 2002). Moreover, the dispersion between national corporate taxation rates is shrinking rapidly and converging towards a harmonized rate (Gropp and Kostial, 2001). Indeed, between 1988 and 1997, the OECD average statutory corporate tax rate declined from 44 percent to 36 percent - just one percent higher than current U.S. corporate income tax rate. One of the major reasons for this tax-cutting trend appears to be a universal desire to attract mobile capital (like FDI) and simultaneously restrain domestic investors from investing abroad. The potential interrelationship between source-country and host-country taxation rates is thus surely a key factor in determining the success of these national investment strategies.

This paper uses a panel of nine investing countries encompassing Australia, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands and the United Kingdom over the period 1982-2000 to investigate the impact of host-country home-country corporate income tax rates and various taxation systems such as tax credit and tax exemption on US-bound FDI. Whereas Australia, Canada, France, Germany and the Netherlands adopt the tax exemption system, the remaining nations follow the tax credit system. The nine countries together contributed more than 85 percent of total US FDI inflows during the sample period. Using this panel data, we analyze two pertinent and as yet unanswered questions. First, are source-country and host-country corporate income tax rates an important determinant of FDI in the US? Secondly, do investors from tax credit countries differ significantly in their tax response relative to those from tax exemption countries?

The paper itself is divided into six main sections. Section 2 provides a brief synoptic review of the theoretical and institutional background to the analysis. Section 3 provides a summary of the relevant empirical literature and outlines the contribution that this paper seeks to make to the literature. Section 4 summarizes the methodological basis for the panel estimation techniques used to estimate the model. Data definitions and sources as well as the variables employed in the model and *ex ante* theoretical expectations placed these variables are discussed in section 5, while section 6 deals with the interpretation of the empirical results of the estimation procedures. The paper ends with some brief concluding remarks in section 7.

2. Institutional Considerations

The neoclassical approach to international trade has generally assumed that trade is focused on goods and not on factors. This was not considered an unduly restrictive assumption until at least early 1970s. Moreover, Gordon and Hines (2002) have argued that the assumption of a closed economy was widely thought to have been an adequate approximation of the US economy over much of the postwar period. However, subsequent changes in the nature of international trade have meant that taxation policies based on the closed economy assumption are no longer appropriate.

This paper investigates how foreign investors take the taxation regimes of the host country and their home country into consideration in deciding where to locate their mobile capital. This is obviously a critical issue for foreign direct investors because they are typically required to pay corporate taxes in the host country and in their home country after the repatriation of profits. Needless to add, not all nations adopt the same policy of taxing their residents' foreign source income.

Typically foreign investors are subject to corporate income tax in the host country and then after-tax expatriated profits are taxed again in their home nations upon repatriation. Accordingly, the net tax effect will depend not only on the host-country tax regime, but also on how other countries tax their citizens' income from abroad. In general, most nations adopt one of two broad genre of taxation systems. In the first place, countries can impose a territorial taxation structure under which investors are completely exempted from home-country taxation. The second method is a 'worldwide taxation system' in which capital-exporting countries provide a tax credit for the taxes paid in the host country. Following generally accepted nomenclature in the literature, we

refer those countries that use a territorial system as ‘exemption countries’ and those that employ the worldwide system as ‘credit countries’. It seems reasonable to expect that investors from tax exemption countries will be relatively more sensitive to tax rate changes in the US, whereas investors from tax credit countries will be more responsive to tax rate changes in their home country rates if home country tax rates are higher than host country tax rates.

If home country adopts an exemption system, its investors have to pay only host country taxes. Accordingly, they should thus be more concerned about changes in host country corporate tax rates and less sensitive to tax rate changes in the home country. With the perfect capital mobility assumption, investors from tax exemption countries should achieve equal after-tax returns in equilibrium (Swenson, 1994).

Tax credit countries follow a worldwide system of taxing foreign-sourced income, often a residency-based taxation regime. This system allows investors to claim credit for the corporate taxes they have paid in the host country. In other words, they have to pay the difference between the host-tax rate and the home-country rate. For example, the top corporate income tax rate in Japan is 42 percent while the US has a 35 percent rate. Since both countries adopt the credit system, a Japanese firm that earns 1,000 dollars in the US pays 350 dollars corporate income tax in the US and an additional 70-dollar yen equivalent in Japan.

If the host country tax rate exceeds the home country rate, then that nation should be considered a tax exemption nation. For example, in Ireland the current top corporate tax rate is 16 percent. Accordingly, an Irish firm that operates in the US only has to pay US corporate taxes. This situation is called excess foreign tax credit. Our sample of

nations consists mainly of tax credit countries that face a deficit foreign tax credit rather than an excess foreign tax credit. Under these circumstances, a given increase in the host country corporate tax rate can have a subtle effect on FDI inflows. In terms of the earlier example centered on US and Japanese corporate tax rates, suppose that the US raises its top corporate income tax rate to 36 percent. The Japanese firm will now pay 360 dollars in the US and 60 dollars in Japan, with its total corporate tax liability remaining constant. In addition, the Japanese firm may now be in an even more favorable position relative to domestic investors as well as to investors from other tax exemption countries and may increase investments in the US as a consequence. It is thus important to gather empirical evidence on this complex relationship between international corporate tax regimes and investment decisions.

3. Empirical Approaches to FDI Determinants

The empirical literature on FDI and taxation has two main strands; research based on time series estimation techniques and work using panel estimation procedures. In this synoptic description of the relevant literature on these two approaches, we ignore the majority of earlier time series studies because they neglected home-country tax rates, with the notable exception of Slemrod (1990).[1]

Slemrod (1990) is the first time series study that controlled for the tax system of the home country. Using FDI data for 3 credit countries and 4 exemption countries, he tested the hypothesis that FDI from exemption countries should be at least as sensitive to US tax rates as FDI from tax credit countries, but found no convincing evidence. Cassou (1997) extended Slemrod (1990) using a panel approach. Drawing on a sample of six

[1] See Hines (1997) and Mooij and Ederveen (2001).

investing countries, he found a significant negative relationship between corporate income tax rate and the amount of inbound FDI, suggesting that home country corporate income tax rates have a substantial impact on investment flows. However, Cassou (1997) did not differentiate between tax credit and tax exemption countries.

Swenson (1994) questioned the purported negative relationship between corporate tax rates and FDI in the US based on the general equilibrium results derived by Scholes and Wolfson (1990), who argued that (in some cases) it is possible that foreign investors increase their investments in response to higher US corporate taxes. In the event, Swenson (1994) found a positive tax elasticity for the investments from tax credit countries.

Over the years, the empirical literature has expanded by extending the analysis of taxation and FDI in various ways. For instance, some studies have investigated the impact of state corporate income tax rates on the allocation of FDI in the US. Thus Hines (1996) established that foreign investors from tax exemption countries are considerably more responsive to US state taxes than investors from tax credit nations. Along similar lines, Agostini and Tulayasathien (2003) found that the tax rate elasticity for credit countries is not statistically different from exemption countries using a discrete choice model.

Instead of using inbound FDI data, some researchers employed outbound FDI data to evaluate tax impacts on FDI flows. For example, Cummings and Hubbard (1994) found that American investors are less tax sensitive to host country tax rates because of the tax credit system used by the US. Similarly, Desai, Foley and Hines (2002) also

established that different tax systems in different countries affected the tax sensitivity of FDI.

Most empirical work on taxation and FDI has focused on FDI inflows in a single country. Quere, Fontagne, and Revil (2001) addressed this limitation in the literature by undertaking a multi-country analysis using a panel of bilateral FDI flows across 11 OECD countries over the 1984-1996 period. They reported significant negative tax rate elasticity, with credit tax systems having reduced the fiscal incentives to relocate. Gropp and Kostial (2001) also observed that tax exemption countries experience larger outflows than credit countries. Wei (2000) made a further substantial contribution to the literature by using FDI stocks rather than flows from 12 source countries to 45 host countries. He found that one- percent increase in the top statutory marginal corporate income tax rate reduced inward FDI by 4.8 percent. However, his results yielded no significant difference in tax responses to the different taxation regimes of the various home countries. Finally, Mooij and Ederveen (2001) contend that, while it is difficult to generalize from the existing body of literature due different specifications and data sets, if various studies are placed in a uniform format, then it appears that investors from tax exemption countries are more likely to respond to changes in host country taxes than investors from tax credit countries.

The present paper seeks to contribute to this growing empirical literature in several ways. In the first place, it represents the first attempt to use panel estimation techniques to analyze the impact of home country tax systems on financial flows of FDI into the US[2]. Cassou (1997) is the only panel study that takes both home and host country tax rates into account, but he did not control for the different tax systems of the

[2] Slemrod (1990) used time series techniques to analyze this issue.

various home countries. Secondly, we employ a more comprehensive data set than Cassou (1997) who covered FDI and tax data only through 1970-1989. This limitation is critical to his findings because we have witnessed a considerable change in tax rate regimes by major investing countries as well as a remarkable increase in FDI inflows in 1990s. By contrast, we employ data for nine countries over the period 1982-2000, enabling us to capture all significant changes in tax policies over the past two decades.

A third advance on the extant empirical literature pertains to the type of corporate rate used to estimate the tax rate elasticity. In essence, there are three popular corporate income tax rates have been adopted the relevant literature; the top statutory marginal rate (SCTR), the effective marginal rate (EMCTR), and the effective average tax rate (EACTR). Both EMCTR and EACTR are based on tax codes and other variables, like interest rate and depreciation rate. However, no consensus exists among researchers on which taxes should be used for estimating the tax rate elasticity and previous work has generally used only one form of the corporate tax rate. Our paper incorporates all three forms of tax rates and thus facilitates comparative findings.

Finally, we control for other important determinants of FDI. Compared to time series work that is confined to a small data set, a panel study has the advantage of including more relevant variables. Previous studies have not made use of this feature and are almost always limited to very few explanatory variables, such as gross domestic product, exchange rate and unemployment rate. Even papers that have controlled for non-tax determinants have been unable to include them all together in a single study. This paper controls for all the explanatory variables that have been found significant in other separate studies. In addition to the commonly used variables indicated, we have

included bilateral trade, unit labor cost, interest rate, a proxy for infrastructure, and relative GDP to control for non-tax determinants.

4. Methodology

This paper uses panel estimation techniques to estimate the model. A panel approach has a number of advantages over a single time series or a cross section method of estimation. It allows researcher to use more observations and have a larger numbers of degrees of freedom. This allows for the inclusion of more explanatory variables, which may lessen omitted variable bias. It facilitates the investigation of questions not amenable to empirical pursuit under pure cross sectional or time series analysis. Moreover, it has been shown that pure time series studies have produced weaker results compared to panel studies in the area of FDI and tax regime research (Ederveen and Mooij, 2001).

There are three main methods that can be used to estimate a panel. The general form of the linear model is given in the equation (1).

$$FDI_{it} = \alpha_{it} + \beta'_{it} X_{it} + \varepsilon_{it} \qquad (1)$$
$$where, \quad i = 1,2,3.....9 \quad t = 1,2,3,.....19$$

α and β'_{it} are 1x1 and 1x k vectors of constants that vary across time and countries. X'_{it} is a 1x k vector of explanatory variables and ε_{it} is the error term[3]. Throughout this paper, we assume that parameters are constant over time. This is a readily defensible

$$FDI_{it} = \alpha_{i} + \beta'_{i} X_{it} + \varepsilon_{it} \qquad (2)$$
$$where, \quad i = 1,2,3.....9 \quad t = 1,2,3,.....19$$

[3] See Hsiao (2003) for detailed information on panel estimation techniques.

assumption because our sample uses data that spans no more than two decades. With this assumption, the general equation can be written as in the equation (2).

This general form varies according to the specific model that used to estimate the model. In constant coefficient method, all time series and cross section observations are combined and then ordinary least squares is applied to the entire data set assuming both regression slope coefficients and intercepts are identical across countries and over time.

However, if the observations are not independent and differences exist between cross sectional or time series observations, this method may lead to false inferences. This single OLS regression generally produces biased estimators. Hence, an analysis of covariance test is conducted to determine the homogeneity of regression coefficient. If the test rejects overall homogeneity we have to account for that because heterogeneity bias may lead to meaningless results. Fixed effects and random effects models make necessary changes to the intercept term to account for this heterogeneity.

In a fixed effects model, heterogeneity is taken care of by including dummies to capture cross sectional specific effects or time specific effects. This method captures systematic differences by raising or lowering the intercept term by a fixed amount for each cross sectional units. Accordingly, the fixed effects estimator allows the intercept to vary across cross sections, though each country's intercept stays constant over time. This model sometimes called least squares dummy variable model. Equation (3) displays the specific form that we use to estimate fixed effects model.

$$FDI_{it} = \alpha_i + \beta_i' X_{it} + \varepsilon_{it} \qquad (3)$$

$$where, \quad i = 1,2,3.....9 \quad t = 1,2,3,.....19$$

A fixed effects model is easy to estimate and analyze. However, it has some limitations. The major problem is that it uses a large number of dummy variables that reduce the degrees of freedom. Furthermore, results cannot be generated from sample predictions. However, these problems can be reduced by using a random effects model.

The random effects model treats omitted individual specific factors as random variables rather than constant terms. This model implies that unknown country specific factors are better explained through an error term rather than a constant. However, in the present paper we do not estimate random effects model for three obvious reasons. In the first place, in order to estimate a random effects model, it essential that the number of cross section units be higher than the number of coefficients in the model. Since we have data for only 9 investing countries, we cannot employ a random effects model unless one variable is dropped from the regression. The fixed effects model does not suffer from this limitation and allows us to make use of all theoretically relevant variables in the analysis. Second, a random model is more appropriate if the researcher is expecting to make predictions outside the sample and the sample does not contain all existing cross sectional units. Our data panel covers more than 85 percent of total FDI data into the United States. This makes it less likely that results will be used to make 'out of sample' predictions. Thirdly, when the panel contains data for many years, both fixed effects and random effects models should produce similar results. Our panel contains 19 years of annual data; very large for a panel analysis. The fixed effects model is thus more appropriate for our present purposes.

Since this paper employs three forms of corporate tax rates (i.e. statutory marginal, effective marginal, and effective average), separate equations are estimated for

each tax rate. This enables us to compare the results and determine which tax rate is most important for foreign investors. Finally, the sample is divided into tax credit and tax exemption groups and utilizes similar techniques to examine the impacts of different tax systems on foreign investor behavior.

5. Data Definitions, Data Sources and Explanatory Variables

A panel of nine countries covering the years 1982-2000 was used to estimate the model. The panel consisted of 5 tax exemption countries and 4 tax credit countries. All variables are expressed as natural logs[4].

The dependent variable is the magnitude of foreign direct investment (FDI) in the US from each investing country measured in millions of US dollars. FDI data were obtained from OECD international Direct Investment database. The requisite tax data was drawn from International Fiscal Studies (IFS) (2002) publications.[5]

The sum of the top federal corporate income tax and the average local corporate income tax rate is defined as the statutory corporate income tax rate. For example, we added an extra 4 percent to the US top federal corporate income tax rate to incorporate the influence of state corporate income taxes. Effective marginal and average tax rates have been calculated under a number of different assumptions. Both rates assume that FDI is financed by transfer funds or reinvested earnings. However, there are some rate-specific assumptions. For instance, in the literature researchers typically consider real interest rate and depreciation rates as fixed. However, they use country and time specific rate of inflation in calculating effective marginal effective corporate income tax rate.

[4] A constant is added to the FDI series to make the log transformation feasible. This strategy is very common in the literature (see, for example, Hartman, 1984, Slemrod 1990, and Cassou 1997).
[5] IFS obtained original data from Devereux, Griffith, and Klemm (2002).

Furthermore, they assume a fixed 10 percent rate of economic profit for calculating the effective average corporate income tax rate.

Data for the other explanatory variables were obtained from various sources. For example, information on GDP and telephone lines per 1000 people was taken from the IMF world economic database. We used OECD database for information on bilateral trade and unit labor costs data, whereas data for other control variables were obtained from the Federal Bank of St. Louis's FRED II database.

We now briefly describe explanatory variables employed and the economic reasoning for their inclusion as well as the expected signs for tax and non-tax coefficients. Three types of host country tax rates along with their home country counterparts were used. As far as whole sample is concerned, we expect FDI to be negatively correlated with the host country corporate tax rate and positively associated with the home country tax rate.

These results may vary once different tax systems are allowed to enter the model. For example, we anticipate a less severe negative effect, or even a positive impact, from the investors from tax credit countries for a change in the US tax rate. Conversely, investors from tax exemption countries should respond strongly to tax rate changes in the US because they pay only American taxes. As far as home country taxes are concerned, we expect an insensitive response from tax exemption group.

Both Horst's (1972) location hypothesis as well as Dunning's (1981) eclectic approach suggest that wage rate differences affect location decisions by multinational corporations. Empirical evidence largely supports this notion (see, for example, Culem

(1988) and Chakraborty and Basu (2002)). In order to control for this, we included unit labor costs (ULC) as an explanatory variable and anticipated a negative coefficient.

The market size hypothesis suggests that multinational companies always evaluate the size of the host country market when considering a location. This is particularly true for the US because it has the largest domestic market of any country. The ratio of host country GDP to the home country GDP (BGDP) is thus included to control for market size. We expected a positive coefficient for this variable.

Trade can influence FDI inflows in two different ways. International trade and FDI act as compliments or substitutes. If they are complements, then higher trade between two countries should be associated with larger amount of FDI flows. The substitution argument is based on the findings that a multinational will locate production operations close to its markets and FDI will substitute for trade if costs are not negligible (Quere, Fontagne, and REvil, (2001)). Accordingly, we included bilateral trade (BITR) as an explanatory variable, but did not hypothesize any a priori sign.

Foreign investors pay particular attention to infrastructure available in a host country when determining whether a subsidiary should be established. Good infrastructure should obviously encourage investment. However, a practical problem is what variable should represent infrastructure in the host country. Some studies have used per capita energy consumption or expenditure on road transport (see, for instance, Billington (1999)). We employed telephone line availability per 1000 customers (INFRA) as a proxy for the infrastructure and hypothesized a positive coefficient for this variable.

It has been observed that foreign investment rises as the US dollar depreciates and conversely falls as the American dollar appreciates (Swenson (1994)). Froot and Stein (1991) contend that the depreciation of the US dollar after 1985 had been the primary cause of the unprecedented increase in FDI inflows into the US. This study included the bilateral exchange rate (EXR) as an explanatory variable to control for this influence.

Differences in the cost of capital are regarded as potential determinant of FDI inflows. We used the US prime interest rate (INTR) to control for the cost of capital. This can also act as a proxy for the rate of return that investors earn. According to the differential rate of return hypothesis, international capital flows from one country to another until rate of return advantages are exhausted. We thus expected to see a negative relationship between the interest rate and FDI inflows.

6. Interpretation of Results

We began the estimation procedure by estimating a constant coefficient model. It ignored time and cross sectional dimensions by assuming that the intercept and slope coefficients are constant. We then tested the null hypothesis that intercepts are equal. Since our results convincingly reject the null we proceeded to estimate fixed effects model. For the sake of brevity, the constant coefficients results are omitted. We also found that the specification that allows for heterogeneity across cross section terms would improve the results. We thus estimated a heteroskedascity corrected fixed effects model and only analyzed findings based on GLS results.

Table 1 shows that the results confirm that foreign investors are responsive to the US corporate income tax rate. The coefficient of the statutory tax rate is negative and

statistically significant at the 5 percent level. A one percent increase in the statutory top corporate tax rate reduces FDI inflows by 1.1 percent. The coefficient on the average effective tax rate has the expected negative sign, but is not statistically significant.

As we had hypothesized, the home country corporate tax rate seems to be a significant determinant of FDI inflows into the US. Coefficients of both effective marginal tax rate and effective average tax rate are positive and statistically significant. As far as statutory tax rate is concerned, it displayed the expected positive sign, but was statistically insignificant. Hence, in general, results indicate that whenever a home country increases its corporate tax rate, investors experience a reduction in their existing after tax rate of return and start moving mobile capital from their own country and invest abroad, possibly invest in the US through FDI. On average, a 10 percent increase in the home country effective marginal corporate tax rate would increase FDI inflows of the US by about 6 percent. Our results also reveal that the response for the home country tax rate is smaller in magnitude than for the host country tax rate. For instance, the average significant tax rate elasticity is –1.1 for the host country tax rate, while it is only 0.55 for the home country tax rate.

Relative GDP also appears to be one of the most important determinants of FDI. This again demonstrates the generally accepted market size hypothesis regarding the determinants of FDI. Ample empirical evidence exists suggesting that market size is a positive and significant determinant of FDI (see, for example, Lee and Mansfield (1996)). The impact of market size is not only highly significant but also quite large in magnitude; a 1 percent increase in relative GDP would increase FDI inflows by approximately 5.5 percent.

Existing empirical evidence generally indicates that trade between host and home countries tends to be positively associated with the amount of FDI inflows implying that they are compliments rather than substitutes (see, for instance, Billington (1999)). Our results strongly support this view. The bilateral trade variable can also be considered an indicator of 'openness'. Our results imply that openness leads to more FDI flows. It is interesting to note that the trade variable is significant for the three tax rates and is similar in magnitude in every case. Specifically, this study shows that, on average, a 10-percent increase in bilateral trade would increase FDI inflows by 13 percent.

The results reveal that investors are concerned about the infrastructure in the host country. We find that infrastructure is positively related to FDI inflows. This relationship is significant only on effective marginal tax rate. As far as magnitude is concerned, infrastructure is not as strong as other macroeconomic variables, such as market size and trade. Since all the countries in our sample have excellent infrastructure, it is hardly surprising that investors do not consider infrastructure as a critical factor when investing in the US.

Turning to other non-tax variables, the exchange rate exerts a statistically significant negative effect on the amount of FDI inflows. This implies the intuitively plausible hypothesis that a cheap dollar is an attractive factor for the foreign investors. Statistically significant relationships hold for all three types of tax rates. As the statistics in Table 1 demonstrate, our study generates an inelastic coefficient for the exchange rate regardless of the type of tax rate in the model. The results thus suggest that the interest rate is not a significant determinant of FDI inflows into the US.

As we argued earlier, a change in the corporate income tax rate could generate varying impacts on foreign investments depending on whether investors are from a tax credit or a tax exemption country. Since capital exporting countries differ in their treatment of foreign source income, investors from those countries may also differ in their response to the US corporate tax rate changes.

In order to analyze this question, we split the sample into tax credit and tax exemption groups. We then estimated each pool using the fixed effects model. It was not possible to estimate the random effects model because it required the number of cross section units to be higher than the number of coefficients to be estimated. We did not focus on the GLS results for the following reason: Since we split the sample into two relatively homogeneous groups, this procedure alleviated any heteroskedasticity problem that might otherwise have appeared in the whole sample. Given that there is no serious heteroskedasticity problem, the OLS is thus the best estimator and not the GLS. Our preliminary estimation showed that GLS results are inconsistent and produced weaker results compared to those of OLS.

Table 2 and Table 3 display the OLS results of fixed effects model for the tax credit panel and tax exemption pool respectively. Table 2 provides some support for our hypothesis that tax credit countries are less responsive to the US corporate tax rate changes. None of the host country tax coefficients are statistically significant for the tax credit panel implying that foreign investors are more concerned about the home country taxes than about the US corporate tax rate. This is intuitively plausible because investors can deduct the corporate taxes they paid in the host country when calculating home country corporate tax liability.

Unlike the credit group, the statutory tax rate exerts a significantly negative effect on investors from tax exemption countries. Table 3 illustrates that if the US statutory corporate income tax rate decreases by 1 percent, then FDI inflows from tax exemption countries would go up by 1.9 percent. Investors from exemption countries have no corporate tax obligations in their home country. It should thus not be surprising to find that they are very sensitive to the host country tax rate. Host country tax coefficients are not only significant, but also are larger in magnitude than those for the tax credit group. To illustrate, statutory corporate tax rate elasticity is a little more than twice the size for the exemption group than the one for the credit group.

Finally, we discuss whether home country taxes could affect differently on tax credit countries and exemption countries. As previously stated, we expected a negative response from credit countries and no response from exemption countries. Table 3 shows that none of the tax coefficients is statistically significant suggesting that exemption countries in fact are not sensitive to their home country tax rate changes. This is intuitively appealing since if they have no tax obligations in their home country, there should be no reason to be concerned about home country tax policy changes.

Results for the tax credit countries are rather ambiguous. We had hypothesized a significantly negative coefficient on the home country tax rate for the credit panel. Although effective marginal tax rate elasticity is statistically significant at the 1- percent level, the positive sign contradicts theoretical intuition. On the other hand, the statutory tax rate and the effective average tax rate both have the expected negative sign, but both are statistically insignificant. There are several reasons that might have accounted for this ambiguity. Firstly, a tax credit system is complicated compared to an exemption system.

For instance, some countries (like the US and Japan) allow for the deference of home country tax liabilities until they have been repatriated through dividends. However, the possibility of indefinite deferring can turn a credit country to an exemption country. Another complication arises if a home country reduces its corporate income tax rate such that the tax position of its investors changes from an excess tax credit to a deficit credit situation. By way of illustration, the UK has reduced its top corporate tax rates several times transforming it in practice into an exemption country from a credit nation. Although the UK still remains as a credit country, its residents who invest in the US currently have no home country tax obligations since they are now in a deficit credit situation because current US tax rate is higher than the UK tax rate.

Concluding Remarks

In this paper we have used a panel of nine capital-exporting countries to investigate the impacts of corporate income taxes on FDI in the US. In contrast to previous empirical work, both host country and home country tax rates have been considered. Various measures of corporate tax rates have been employed and different methods of pool estimations estimated.

The empirical results presented in this paper lead to the following conclusions. In the first place, the US corporate income tax rate exerts a significantly negative impact on inbound American FDI. This finding is generally consistent with different pool specifications as well as different tax rates used in the model. However, results are more robust for statutory tax rates than for effective rates. Investors are probably more knowledgeable about host country statutory tax rates than effective rates, an thus this finding is not too surprising. A heteroskedasticity corrected fixed effects model

established an approximately unitary elasticity for the statutory tax rate, suggesting that a one percent increase in the US corporate income tax rate would decrease FDI inflows by one percent. Conversely, the home country tax rate share a positive association with FDI inflows. The coefficient for the home country tax rate is inelastic for every tax rate specification, which implies that the US should not expect considerable FDI inflows in an event of a tax increase in a capital exporting country.

Secondly, host country tax rate elasticities for exemption countries are systematically different from those of credit countries. This suggests that investors from exemption countries are more responsive to taxes than investors from credit countries. Compared to whole panel, the host country tax elasticity is larger in absolute value for exemption countries than for credit countries. However, the two groups are not systematically different in their response to changes in home country tax rates. For example, we hypothesized a zero or very small response from tax exemption countries and a stronger negative response from credit countries. Though results for exemption countries are in line with our a priori expectations, inconsistency is apparent for tax credit countries. Complexities in the credit system, such as tax deferral and excess foreign tax credit, may account for anomaly.

Thirdly, even though our results strongly indicate that the corporate tax rate is an important determinant of FDI in the US, we should not underestimate the role of other non-tax determinants. We find that non-tax determinants, including market size, labor costs, bilateral trade and exchange rates, consistently exert a statistically significant impact on FDI inflows. It follows that our results emphasize the importance of a

combination of fiscal policy and macroeconomic policy to stimulate FDI inflows into the US.

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Appendix A

Table 1
Fixed Effects Specification: GLS Results

Variable	Statutory Tax Rate	Effective Marginal Tax Rate	Effective Average Tax Rate
Host Tax	-1.100[b]	0.724	-0.912
	(0.485)	(0.570)	(0.638)
Home Tax	0.069	0.626[a]	0.512[c]
	(0.293)	(0.102)	(0.289)
ULC	-6.117[a]	-7.070[a]	-5.862[a]
	(1.206)	(1.263)	(1.197)
RGDP	5.947[a]	7.035[a]	4.891[a]
	(1.575)	(1.220)	(1.485)
BITR	1.313[b]	1.311[a]	1.371[a]
	(0.509)	(0.425)	(0.510)
TPLUS	1.631	2.570[c]	1.662
	(1.524)	(1.328)	(1.504)
INT	-0.071	-0.281	-0.051
	(0.190)	(0.187)	(0.191)
EXR	-0.432[b]	-0.900[a]	-0.401[b]
	(0.217)	(0.192)	(0.201)
Adjusted R^2	0.958	0.971	0.957

Note: Standard errors are in parentheses. a, b, c indicate significance at the 1%, 5%, and 10% levels respectively. Variables are in natural logs.

Table 2
Fixed Effects Specification OLS Results: Credit Countries

Variable	Statutory Tax Rate	Effective Marginal Tax Rate	Effective Average Tax Rate
Host Tax	-0.867	0.320	-1.512
	(1.005)	(1.178)	(1.379)
Home Tax	-0.516	0.931[a]	-0.783
	(0.653)	(0.261)	(0.882)
ULC	-8.914[a]	-10.269[a]	-9.471[a]
	(2.955)	(2.857)	(3.089)
RGDP	0.240	3.903	1.251
	(3.882)	(3.597)	(4.029)
BITR	1.846[b]	2.245[a]	1.790[b]
	(0.722)	(0.694)	(0.738)
TPLUS	-1.366	-0.144	-0.419
	(1.973)	(1.886)	(2.090)
INT	0.471	0.400	0.505
	(0.401)	(0.450)	(0.410)
EXR	-0.175	-0.254	0.013
	(0.449)	(0.447)	(0.510)
Adjusted R^2	0.662	0.662	0.625

Note: Standard errors are in parentheses. a, b, c indicate significance at the 1%, 5%, and 10% levels respectively. Variables are in natural logs.

Table 3

Fixed Effects Specification OLS Results: Exemption Countries

Variable	Statutory Tax Rate	Effective Marginal Tax Rate	Effective Average Tax Rate
Host Tax	-1.911[c]	1.599	-1.816
	(0.966)	(1.265)	(1.157)
Home Tax	0.513	0.402	0.582
	(0.712)	(0.326)	0.623)
ULC	-6.950[a]	-8.298[a]	-6.787[a]
	(2.384)	(2.323)	(2.049)
BGDP	7.542[b]	7.795[a]	7.141[a]
	(3.063)	(2.231)	(2.654)
BITR	0.417	0.548	0.492
	(0.392)	(0.367)	(0.398)
INFRA	5.306[a]	5.618[a]	5.226[a]
	(1.229)	(1.303)	(1.240)
INT	-0.209	-0.567	-0.194
	(0.297)	(0.372)	(0.294)
EXR	-0.440	-1.028[a]	-0.564
	(0.384)	(0.356)	(0.350)
Adjusted R^2	0.563	0.559	0.561

Note: Standard errors are in parentheses. a, b, c indicate significance at the 1%, 5%, and 10% levels respectively. Variables are in natural logs.