

Public Policies and FDI Location: Differences between Developing and Developed Countries[#]

Timothy Goodspeed*
Hunter College and CUNY Graduate Center
timothy.goodspeed@hunter.cuny.edu

Jorge Martinez-Vazquez**
Georgia State University and rede, Universidad de Vigo
jorgemartinez@gsu.edu

Li Zhang***
Central University of Finance and Economics, China
zhangl@cufe.edu.cn

September 28, 2010

Abstract: Host country government officials in developing and developed countries alike would like to know the impact of their public policies on foreign investment in their countries. Unfortunately, the literature does not provide a single view, and there are likely to be differences in the correct answer between developing and developed countries. This paper examines the impact of three host country government policies on the host's FDI stock: taxation, good governance, and infrastructure. We focus on whether the impact of these factors on FDI differs depending on the level of development of the host country. The regression results indicate that FDI is sensitive to host country taxation in developed countries, but not in developing countries; FDI is sensitive to host country governance measures and corruption in both developing countries and developed, with a somewhat larger impact for developing countries; and FDI shows sensitivity to host country infrastructure quality in both developed and developing host countries.

* Mailing Address: Hunter College, Department of Economics, 695 Park Avenue, NY, NY, 10021 USA

** Mailing Address: Georgia State University, Andrew Young School of Policy Studies, 14 Marietta Street, Suite 557, Atlanta, Georgia 30303-3083.

*** Mailing address: Central University of Finance and Economics, China Academy of Public Finance and Public Policy, 39 South College Road, Haidian District, Beijing, 100081, China.

[#]We gratefully acknowledge the comments of participants in the 7th Bundesbank MiDi Workshop, October 6, 2009, the Oxford CBT 2010 Summer Symposium, the 2010 IIPF Meetings and particularly Serena Fatica, two referees, Alfons Weichenrieder; we also thank Partha Deb for useful discussions. All errors are our own. Goodspeed gratefully acknowledges support from PSC-CUNY grant # 63707-00 41.

I. Introduction

Foreign direct investment (FDI) can provide a number of benefits to countries that need capital including higher growth, greater exports, higher wages, and greater productivity through technology spillovers to local firms. While the evidence of the impact of FDI is somewhat mixed,¹ government officials in developing and developed countries alike would like to know the impact of their public policies on foreign investment in their countries. Unfortunately for government officials, the literature does not provide a single view. This is in part because the literature on the impact of policies on FDI has taken place in at least four sub-disciplines within economics (public finance, international economics, development economics, and regional economics), but perhaps more importantly because previous studies have generally not differentiated between developing and developed countries. Our contribution is to differentiate the impact of public policies for developing host countries from the impact of public policies for developed host countries.²

We examine the impact of three public policies on FDI in developing and developed countries: taxation, infrastructure, and a good business environment. While these public policies have been studied separately, few if any studies that we are aware of consider the possibility that developing and developed host country public policies impact FDI differently. We find some striking results that sometimes contradict the perceived wisdom for developing countries. For instance, with respect to taxes, Gordon

¹ Lipsey (2002) surveys this literature and finds that the evidence indicates that FDI increases exports, sometimes increases growth (especially in developing countries with export promotion policies), has a somewhat ambiguous impact on local wages, and also has an unclear impact on technology spillovers to local firms.

² Blonigen and Wang (2004) suggest that even factors other than public policies could affect FDI differently for developing and developed countries.

and Hines (2002) find that “econometric work of the last fifteen years provides ample evidence of the sensitivity of the level and location of FDI to its tax treatment.” We find a more nuanced result: host country taxes negatively affect FDI for developed countries, but have no impact in developing countries. Madies and Dethier (2010, p. 20) interpret the previous literature in a way that is even more at odds with our result when they say “Most empirical studies ... conclude that FDI inflows into developing countries are sensitive, to various degrees, to corporate income taxation and fiscal incentives.”

We think that there are good reasons to suspect that the impact on FDI of the three public policies we examine might differ between developing and developed countries. Perhaps most obvious is the case of good governance.³ While most developed countries already have a high level of laws, customs and institutions that create a good governance environment, the same cannot be said for most developing countries. Thus, if one accepts the premise that good governance attracts FDI, diminishing marginal returns to governance suggests that a marginal improvement for developing countries would have a bigger impact on FDI than for developed countries. A similar argument can be made for infrastructure.⁴ Developed countries often have good infrastructure while developing

³ The level of corruption is one measure of the business environment and Wei (2000a, 2000b) has carefully studied this aspect. He finds significant negative effects using several definitions of corruption. Dharmapala and Hines (2009) document the importance of good governance for tax havens, and find that taxes affect US FDI in well governed but not poorly governed countries, a result that is strikingly similar to our results with respect to taxes. Fatica (2009) uses a cross-section of countries and finds that the sensitivity of foreign investment to the tax rate varies with the level of host country institutional quality. A recent OECD working paper, Hajkova, Nicoletti, Vartia, and Yoo (2006) finds that government policies other than taxes are important determinants of FDI location in OECD countries.

⁴ In the international literature, Wheeler and Mody (1992) conducted an early and influential study of foreign investment determinants and found that agglomeration – measured by infrastructure quality – is an important determinant while taxes are not a significant determinant. A more recent study by Cheng and Kwan (2000) examines FDI in China and finds a positive impact of infrastructure, but they do not include a tax measure. The idea that government spending and investment decisions as well as taxes influence location decisions is a central theme of studies that examine regional or within-country location of mobile factors and is embodied in Tiebout (1956) models of location. Other papers in public finance have started to incorporate spending as well as taxes in examining FDI location (e.g. Buettner (2002) and Bénassy-

economies do not. Again, if one accepts the premise that good infrastructure attracts FDI, diminishing marginal returns to infrastructure suggests that additional investment in infrastructure might have a bigger impact in developing countries than developed countries.

The case of taxation is perhaps the most complex.⁵ Taxes can be avoided on a variety of margins from changing the level of FDI directly to other more subtle methods such as transfer pricing and routing repatriations through several countries. In addition, the tax regime of the source country can also impact the effect of taxes; for instance a worldwide taxation system for the source country generally implies little impact for destination countries with tax rates lower than the source country. One reason that taxes might not be so important in developing countries is that tax administration is weaker in developing countries. If taxes are easier to avoid, the tax rate might have little impact on FDI. Thus, differences in tax enforcement abilities of developing and developed countries could lead to differences along one or more margins and hence to differences in the impact of taxes on FDI. Our goal is not to investigate the validity of tax avoidance arguments per se (though this would be an interesting topic for future research); our goal is the more modest one of testing whether FDI responds differently to tax and other public policies in developing and developed countries. As noted in the above quotes

Quéré et al. (2007)) Mutti and Grubert (2004) examine multinational affiliate production and find that sensitivity to taxes is more pronounced in high-income countries, suggesting that “they offer better infrastructure, agglomeration benefits, or a uniquely attractive market opportunity.” (p. 357)

⁵ The tax literature is voluminous but begins from the 1980s, including Hartman (1984), Boskin and Gale (1987), and Young (1988). These papers use a time series of aggregate BEA data. Others, such as Swenson (1994) find significant effects when disaggregating the data by industry. Others, such as Hines and Rice (1994) and Grubert and Mutti (1991), use the cross-sectional breadth of the BEA data to examine FDI across countries for a given year. Firm level studies include Auerbach and Hassett (1993), Cummins and Hubbard (1995), Ondrich and Wayslenko (1993), and Altshuler, Grubert, Newlon (2001). Hines (1996) uses a panel, but exploits state-level tax differences using BEA data. All these studies find significant effects of taxation, but with a wide range of elasticity estimates.

from surveys of the literature in this area, researchers have made some generalizations that may be valid for developed countries, but not for developing countries according to the results we present here.

To summarize, in this paper we empirically examine the impact of a country's public policies on the stock of its FDI. Our focus is on differences between developing and developed countries. We test for those differences along three public policy dimensions: taxation, infrastructure, and good governance. Our findings indicate that the stock of FDI is sensitive to host country taxation in developed countries, but not in developing countries; FDI is sensitive to host country governance measures and corruption in developing and developed countries with changes in corruption having a somewhat larger impact in developing countries; and FDI shows sensitivity to host country infrastructure quality in both developed and developing countries.

The rest of the paper is organized as follows. In section II we present our data. In section III we discuss our estimation results. Section IV concludes.

II. Data Description

Our main objective is to estimate and compare the impact of a host country's taxation, infrastructure quality, and governance quality on its stock of FDI, testing for differences between developing and developed countries. To do this we will use a panel data set with a dummy for the type of country (developing or developed). The dummy is interacted with our main variables of interest (taxation, infrastructure, and good governance) to test whether there are marginal differences between developed and

developing countries. We, of course, will control for other well-known determinants of FDI.

We will use two different measures of FDI for our dependent variable. Our first measure is an aggregate measure of the stock of FDI of country i in year t , and comes from UNCTAD (United Nations Conference on Trade and Development). This measure aggregates together the FDI stock coming from all countries. Our second measure uses OECD bilateral data on the FDI stock of destination country i in year t coming from OECD source country j . This disaggregates substantially the aggregate measure of UNCTAD and gives us a much larger number of observations and degrees of freedom. In both cases we use the log of the relevant FDI stock measure in our regression analysis. The independent variables, described below, are the same for both datasets (except for a dummy variable for the source country and a distance indicator that we use in our analysis of the bilateral OECD data).⁶

For our control variables, we follow the previous literature and include variables that have been consistently found in the past to be determinants of FDI: population, GDP, the unemployment rate, and exports; this last variable, exports, is lagged to try to correct for potential endogeneity. The unemployment rate controls for business cycle effects. Population is a proxy for market size, which other things equal should attract more FDI. Exports control for the openness of an economy. Holding population constant, GDP is a measure of wealth and can be roughly interpreted as controlling for the return on investment or marginal product of capital. Generally, poorer countries lack capital and hence should be expected to have a higher return on investment than wealthier countries, other things equal, which implies an inverse relationship between GDP and

⁶ The distance indicator that we use is computed from the geographic coordinates of capital cities by CEPIL.

FDI. There has been a recent surge of papers that use distance between countries (suggested by the gravity equation as a determinant of FDI), and we include this when possible (specifically in our bilateral OECD data specifications). We also include a source country dummy in these bilateral specifications to control for any observable or unobservable source country factors that affect FDI and that do not vary over time.

Our three main policy variables are taxes, infrastructure quality, and governance quality. These variables present some measurement challenges. Our tax variable is computed as the minimum of: (i) the effective tax rate faced by the firm calculated using data from the Bureau of Economic Analysis (BEA),⁷ and (ii) the statutory tax rate from data from the Office of Tax Policy Research (OTPR).⁸ The idea of this variable is that the statutory tax rate may be too high because of depreciation allowances, tax holidays, and so forth that are granted by the host country. The effective tax rate we use – (i) above – is a simple measure of foreign taxes paid in country *i* divided by profits; if it is lower than the statutory rate, we take this measure which helps to more accurately reflect the true tax burden. This measure is also used by Hines and Rice (1994) and Dharmapala and Hines (2009). We also lag our tax variable to try to correct for any endogeneity.

For our second main policy variable, the quality of infrastructure, we present the results from two measures. The first measure that we use for infrastructure quality is a general ranking computed by the World Competitiveness Center and it is based on data from the IMD World Competitiveness Yearbook. It is one of the four main factors used

⁷ The effective tax rate is calculated as the ratio ((foreign income taxes)/(foreign income taxes + net income)) of all affiliates for U.S. firms operating in each country abroad and for each year. This is a proxy variable as we do not expect that the taxes paid abroad by the U.S. multinationals to be identical to the taxes paid by other multinationals.

⁸ We have the statutory tax rate only from 1995. Consequently we use the effective rate from 1982-1995 and the minimum of the statutory and effective rates for years from 1995 on. We have run some preliminary regressions using only the statutory rate and the results are similar. King-Fullerton effective rates are another possible measure but are unavailable for most developing countries.

in constructing the overall world competitiveness ranking indices from the IMD World Competitiveness Yearbook. The infrastructure ranking is a consolidation of five sub-factors (which are constructed from 110 relevant criteria) and highlight every facet of overall infrastructure condition, including basic infrastructure (roads, other transportation infrastructure, health infrastructure, and others), technological infrastructure (telecommunications, computers, and so forth), energy self-sufficiency, and environmental infrastructure (waste treatment and so forth). The ranking is such that a higher number implies a lower infrastructure quality. To ease interpretation, we subtract the actual ranking from 50 in our regressions so that a higher number implies better infrastructure.

Though constructed with care, some might object to the fact that this measure of infrastructure is a ranking. We therefore also use a second measure of infrastructure, the number of telephone mainlines (telephone lines connecting a customer's equipment to the public switched telephone network) per 1,000 people for the entire country. This measure is obtained from the World Development Indicators (WDI) of the World Bank.

Our third policy variable of interest is a measure of good governance. We again present results from two measures of good governance.⁹ The first is a measure of corruption, the “Corruption Perception Index” from Transparency International. This index is one that is commonly used (one of the measures used by Wei (2000a, 2000b) for instance) and is the measure that we can find that has the most coverage for the countries in our sample. This index ranges in value between 0 and 10. It uses a higher number for

⁹ We also have run regressions using the “rule of law” measure of Kaufmann et al (2009). The results are similar to the results using the broader good governance measure.

less corruption so in our empirical work we subtract the index from 10 in order to ease the interpretation.

We also analyze a second broader measure of good governance, a ranking of government efficiency from the IMD Competitiveness Yearbook. This is a very broad measure that includes information on five areas: public finance, fiscal policy, institutional framework, business legislation, and societal framework. Among the variables used to analyze the institutional framework part of the measure is corruption.

We should note that observations for the three main policy variables (the tax rate, the infrastructure index, and the corruption index) are available for varying numbers of years and countries. In all, 53 (25 developing and 28 developed) countries are covered for the tax rate for the years 1984 to 2002. The time span is shorter for our other variables. The corruption index covers 46 countries from 1995 to 2002 and the infrastructure index 37 countries from 1996 to 2002. We limit our regressions to include countries and years for which all relevant information is available. The list of the countries covered, missing data, definition of the variables, data sources, and summary statistics are presented in Tables A-1, A-2, and A-3 in the Appendix.

III. Empirical Analysis and Estimation Results

This section analyzes the correlation between the pattern of host country FDI stocks and host country policy variables.¹⁰ As mentioned above, we have two measures of FDI stock, one an aggregate measure from UNCTAD, and the other the bilateral stock

¹⁰ As FDI is observed only in countries where there is some institutional quality and the tax rate is not prohibitively high, there could be some selection effects – in our sample of countries, most of the developing ones are relatively wealthy. Missing observations are dropped.

from the OECD.¹¹ As this is our dependent variable, we have constructed two datasets which we will analyze sequentially. We begin by analyzing the aggregate FDI data from UNCTAD.

A. Analysis of UNCTAD aggregate FDI data

A very rough way to begin our examination is to divide our host countries into developing and developed groups, then divide each of these groups in two again according to whether the relevant policy variable (tax rate, infrastructure index, corruption index) is high or low (defined relative to the median of each group). We can then compare the average FDI stock for high and low values of our policy variables within the developing country category, and similarly for developed countries.

The results of this exercise are shown in Charts 1, 2, and 3 for the year 1996. Chart 1 shows average host country FDI stocks for high- and low-tax developed countries, and average host country FDI stocks for high- and low-tax developing countries. A clear inverse relationship emerges for each group: low-tax developed countries have on average greater FDI stocks than high-tax developed countries. Similarly, low-tax developing countries have on average greater FDI stocks than high-tax developing countries. Chart 2 shows average host country FDI stocks for high- and low-corruption developed countries, and average host country FDI stocks for high- and low-corruption developing countries. Again a clear inverse pattern is observed: low-corruption developed countries have on average greater FDI stocks than high-corruption countries, and similarly for developing countries. Chart 3 presents average host country FDI stocks for high- and low-infrastructure quality for developed and developing countries. The inverse relationship is evident for developed country hosts – high-

¹¹ The set of host countries (both developed and developing) is the same in both data sets.

infrastructure quality hosts have higher FDI stocks than low-infrastructure hosts for developed countries. The relationship for developing countries appears flat for 1996.

The results in the charts above are suggestive and we next move to our regression analysis. Our general specification is:

$$(1) \quad \text{Log FDI}_{it} = \alpha_0 + \alpha_1 \text{Dev_Dum}_i + \alpha_2 \text{Year_Dum}_t + \sum \beta_m \text{PolicyVar}_{mit} + \sum \gamma_m \text{PolicyVar} * \text{Dev_Dum}_{mit} + \sum \phi_n \text{Controls}_{nit} + u_{it}$$

where FDI_{it} is the stock of FDI in country i in year t , Dev_Dum_i represents a developing/developed country dummy, Year_Dum_t represents a year dummy, PolicyVar_{mit} represents policy variable m (where $m =$ tax variable, governance variable, infrastructure variable as discussed above), and Controls_{nit} represents control variable n . The semi-log specification implies a non-linear, exponential relationship between the stock of FDI and the explanatory variables. We should mention here that the pooled nature of the data can create a downward bias in the standard errors due to repeated cross-sections (and leading to unwarranted significance of coefficients). We therefore present clustered standard errors, which allows for an arbitrary correlation in the errors of the cluster (countries in our case) for all our regressions.

Table 1 presents results using the UNCTAD data set. The first column of Table 1 presents a regression without any policy variables. While the R^2 is a respectable .49, the main control variables (besides the year dummies) that are significant are the developing country dummy (indicating less FDI in developing countries) and population (suggesting a larger market leads to more FDI). The next two columns of Table 1 add the tax rate interacted with the developing dummy to allow for different coefficients of the tax rate for developing and developed countries. Column 2 shows the interaction term when the developing country takes a value of zero for the dummy variable and column 3

show the results when the developed country takes a value of zero. We use this presentation method to emphasize the differences between developing and developed countries at times throughout the paper because it eases interpretation, and we offer a short explanation here. Obviously the coefficient of the interaction term in column 3 will be the negative of the interaction term in column 2. We show the results in this way in order to present the correct standard error along with the coefficient of the tax rate for developing countries (in column 2) and the correct coefficient and standard error for developed countries (in column 3). Since the developing country dummy is zero in column 2, the coefficient on the policy variable of column 2 presents the correct estimate and standard error for developing countries. The developed country dummy takes on a value of zero in column 3. Hence, the coefficient of the policy variable in column 3 presents the correct estimate and standard error for the developed country.¹²

The remaining columns of Table 1 give somewhat mixed results for our other public policy measures. Column 4 indicates a negative but insignificant coefficient for our corruption measure, but column 5 indicates that the broader efficient governance measure is both negative and significant. The last two columns indicate significance for our infrastructure ranking measure but insignificance for our mainland telephone measure of infrastructure. When we try to distinguish between developing and developed countries for the policy variables other than tax (in unreported regressions), we do not find significance for the interaction term, although there is some significance for the broader governance measure for developed countries. We also note that when our developing/developed dummy is significant our corruption measure loses significance

¹² Obviously the developed country tax coefficient can be arrived at by the addition of the tax and interaction coefficients from column 2. However, the correct standard error for the developed country coefficient is not shown in column 2. This is only easily obtained from column 3.

and when the dummy is insignificant our governance and infrastructure measures are significant; this may suggest that we are having difficulty distinguishing between certain policy variables and being a developing country. This might be improved with more disaggregated data, to which we turn in the following sub-section.

To summarize, the results thus far indicate that taxes are an important determinant of FDI for developed countries, but have little or no effect on the location of FDI for developing countries. The evidence is mixed with respect to governance and infrastructure. There is some evidence that bad governance or bad infrastructure reduces FDI in Table 1. We will leave further interpretation of the coefficients for the regressions using the OECD bilateral FDI data, where we are also able to improve our specification by including distance, a variable suggested by the well-known gravity equation.

B. Analysis of bilateral OECD FDI data

We next turn to our more disaggregated dataset. We will follow the format of our analysis above for the aggregate UNCTAD data. Our general specification for the bilateral data is almost identical to (1) above:

$$(2) \quad \begin{aligned} \text{Log FDI}_{ijt} = & \alpha_0 + \alpha_1 \text{Dev_Dum}_i + \alpha_2 \text{Year_Dum}_t + \alpha_3 \text{Source_Dum}_j \\ & + \sum \beta_m \text{PolicyVar}_{mijt} + \sum \gamma_m \text{PolicyVar} * \text{Dev_Dum}_{mijt} + \sum \phi_n \text{Controls}_{nijt} + u_{ijt} \end{aligned}$$

where FDI_{ijt} is the stock of FDI in destination country i coming from source country j in year t , Dev_Dum_i represents a developing/developed country dummy, Year_Dum_t represents a year dummy, Source_Dum_j represents a dummy for the source country, PolicyVar_{mijt} represents policy variable m (where $m =$ tax variable, governance variable, infrastructure variable as discussed above), and Controls_{nijt} represents control variable n .

The only differences with our earlier specification is that we include a source country dummy for FDI and we are also able to include a distance measure (as suggested by the gravity equation) among our controls since we are using bilateral data here. The semi-log specification implies a non-linear, exponential relationship between the stock of FDI and the explanatory variables. Again the pooled nature of the data can create a downward bias in the standard errors due to repeated cross-sections (leading to unwarranted significance of coefficients). We therefore present clustered standard errors, which allows for an arbitrary correlation in the errors of the cluster (source-destination pair in our case) for all our regressions.

Tables 2 and 3 present the results using the OECD bilateral data. We follow our previous Table 1 analysis of the UNCTAD data in Table 2. The first column of Table 2 presents the results without any policy variables. All of our control variables except unemployment are significant, and with the expected sign. The distance variable is negative indicating that the greater the distance between two countries, the lower is FDI. Population is again positive as before indicating that a bigger market is an attraction for FDI. Exports are also positively related to FDI. The negative sign on GDP is usually interpreted in the literature as reflecting a diminishing return to capital in wealthier countries.

The next two columns of Table 2 add the tax coefficient and a tax interaction term and indicate that our tax variable is significant and negatively related to FDI location for developed countries but not developing countries. The coefficient for developing countries is both very low and insignificant. This mirrors the interesting asymmetry between developing and developed countries with respect to the tax variable that we

documented for the UNCTAD data. The fourth column indicates that greater corruption significantly lowers FDI. The fifth column finds significance for our broader measure of governance: the less well governed is a country, the lower is a country's FDI stock. The sixth column finds that a higher infrastructure quality rating is a significant determinant of a higher FDI stock. The seventh column indicates a significant and positive relationship between our mainland telephone measure of infrastructure and a country's FDI stock. The bilateral OECD data thus shows results similar to the UNCTAD data with respect to the tax variable, but indicate significant impacts of our corruption variable, our broader measure of governance, the infrastructure quality measure, and the narrower measure of infrastructure, telephone mainlines. All of the reported standard errors of the regressions are clustered by source-destination country pair.

A useful interpretation of the tax coefficient is to calculate an elasticity. The coefficient with respect to developed countries from Table 2 is $-.0304$ (the coefficient for developing countries is not significantly different from zero). Converting this to an elasticity (and evaluating at the mean value of the developed countries in the sample) yields -0.78 . Thus, a one percent increase in the tax rate lowers FDI stock by 0.78 percent for developed countries (a result within the range of estimates from other studies), but is not significantly different from zero for developing countries.

Given the high significance of our nontax variables using the OECD bilateral data, we investigate further whether these measures suggest any marginal differences between developing and developed countries. The interaction terms for the mainland telephone measure and the infrastructure quality index are insignificant and to save space,

we will not report those results.¹³ The interpretation for those variables can be drawn from Table 2. The infrastructure ranking coefficient is 0.0214. Converting this to an elasticity evaluated at the mean yields 0.57. Thus a ten percent increase in the infrastructure ranking from the mean of 26.5 to 29 (or from a country like Ireland to one like Japan) increases FDI by about 5.7 percent. The telephone mainline coefficient from Table 2 is 0.00147; converting this to an elasticity evaluated at the mean yields 0.49. Thus, an increase of ten percent in telephone mainlines is estimated to increase FDI by about 4.9 percent.

For our other policy variables, we report our results concerning differences between developed and developing countries in Table 3. We follow our previous presentation method: we define our dummy variable to be zero for developing countries in the first column of the pair and zero for developed countries in the second column of the pair. Thus, the coefficient for the relevant policy variable (with the correct standard error) is that of developing countries in the first column and developed countries in the second column of the pair.

Beginning with the corruption variable, we can see from columns 1 and 2 that the corruption index is negative and significant for both developing and developed countries, with slightly different coefficients. In order to interpret the coefficients for corruption, it is useful to calculate elasticities for developed and developing countries. To do this, we multiply the coefficient and the mean of corruption for the group (developed or developing as the case may be). The result is that a point estimate of the elasticity of FDI with respect to corruption is 0.33 for developed countries and 0.65 for developing

¹³ We should note that the significance of the infrastructure quality index is due mainly to significance for developed countries.

countries. Thus, a small decrease in corruption leads to a greater percentage increase in FDI for developing countries vis-à-vis developed countries. For developing countries, an increase in the corruption perception index by ten percent, from the developing country mean of 6.5 to 7.1 (or from a country with a corruption index like Costa Rica to a country with a corruption index like Colombia), implies a reduction in FDI of about 6.5 percent; for developed countries, the decrease in FDI resulting from a similar percentage increase in corruption is about 3.3 percent.

Columns 3 and 4 of Table 3 present the results for the more general governance indicator. This indicator shows significance for both developing and developed countries, and in fact the computed elasticity is somewhat higher for developed than developing countries (0.41 for developing and 0.76 for developed). Thus, an increase of ten percent in the governance efficiency ranking (a worsening of governance), from the developing country mean of 28 to 31 (or from a country like Mexico to one like Brazil) implies a reduction in FDI of about 4.1 percent. A similar percentage change in the governance efficiency ranking of a developed country implies a reduction in FDI of about 7.6 percent. This is probably attributable to the fact that this governance measure is very broad, and thus is not really focused on the factors that differentiate developing countries.

IV. Conclusion

Being able to attract foreign direct investment is an important part of the growth strategies of developed and developing countries alike. There are various policies that governments may implement to become more attractive to foreign investors ranging from granting a more favorable tax regime to building new infrastructure capacity to

improving governance institutions. A fundamental motivation for this paper is that country government officials everywhere would like to know the answer to this basic question: what are the most effective policy measures I can take to attract foreign investment to my country? The answer to this question may not be the same for developing and developed countries. The literature to date has not directly addressed this question and has not always considered that the answers can be different for developing and developed countries.

In this paper we examine the impact of a country's public policies in the areas of taxation, infrastructure, and good governance on the stock of its FDI. In the analysis we allow for differences in the response of FDI between developing and developed countries, something other papers in the area do not do. Our findings indicate first that the stock of FDI is sensitive to host country taxation in developed countries, but not in developing countries. This is an important and provocative result that contradicts recent surveys of the literature cited in the introduction, and it could be due to weak tax administration in developing countries. It is similar to a result in Dharmapala and Hines (2009) who find that taxes affect US FDI in well governed but not badly governed countries. While beyond the scope of our current study, this is an issue well worth investigating further in future studies. Second, both our governance measures (the corruption index and the broader efficient governance ranking) indicate that FDI is sensitive to the host country measure in both developing and developed countries. A change in the corruption index is found to have a larger impact in developing countries while a change in the broader governance index is found to have a somewhat larger impact in developed countries. Third, the infrastructure ranking and mainland telephone

lines measures indicate that FDI is sensitive to the host country measure in both developing and developed countries.

Thus, an important implication of our findings is that in order to be more effective in attracting FDI, government officials in developing countries should pay more attention to policy programs aimed at improving governance institutions and public infrastructure and, at the same time, de-emphasize imitating the taxation policies of developed countries regarding FDI. These countries would do better to address the more fundamental institutional governance and infrastructure issues. Developed countries on the other hand should pay more attention to taxation issues and also provide good infrastructure and maintain good governance to attract FDI.

Chart 1 Tax Rates and FDI Stocks, 1996

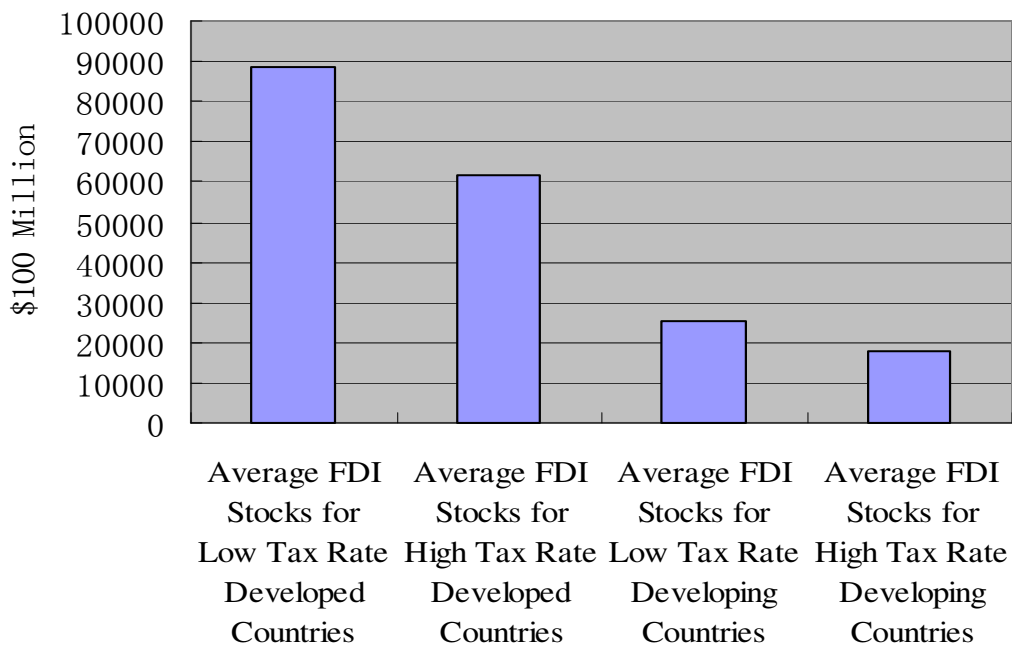


Chart 2 Corruption Index and FDI Stocks, 1996

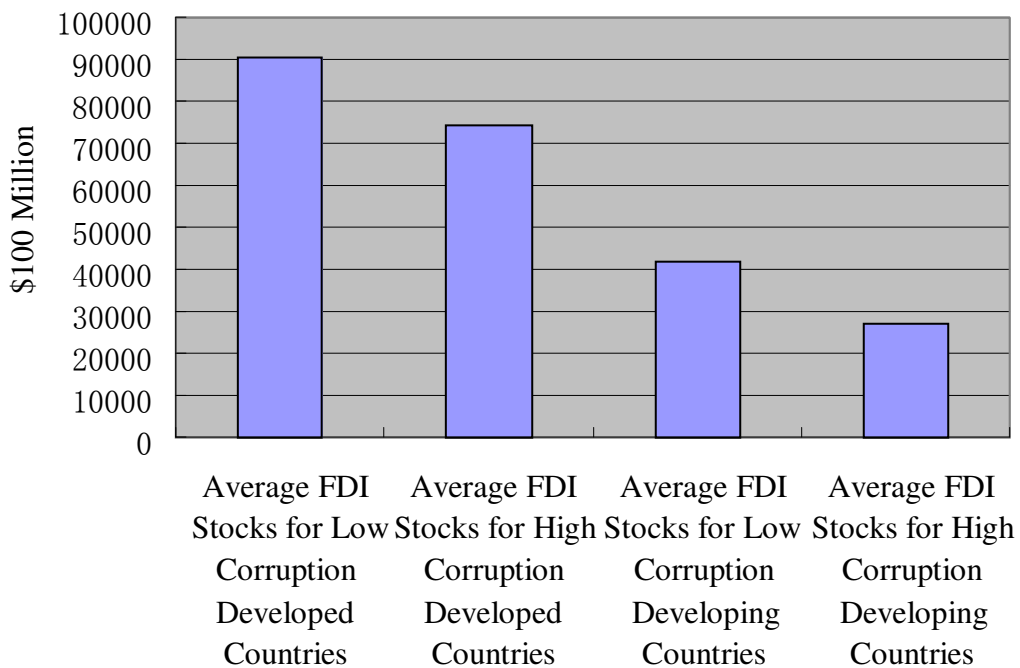


Chart 3 Infrastructure Ranking and FDI Stocks, 1996

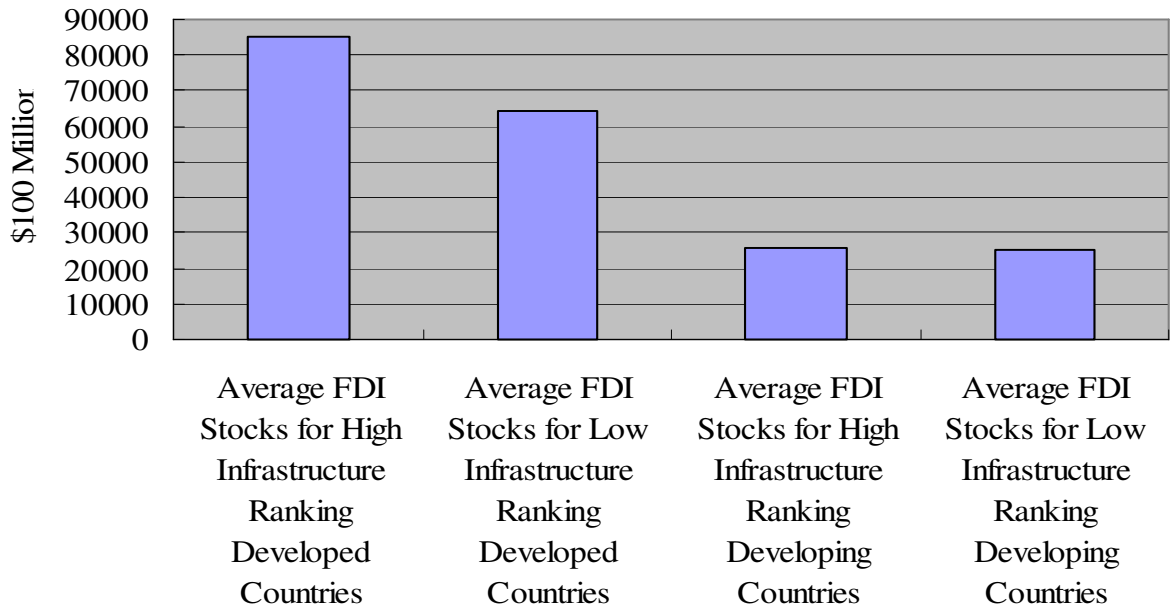


Table 1: Multiple Regressions with UNCTAD data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: Log of FDI Stock							
Constant	9.648*** (0.504)	10.58*** (0.606)	10.58*** (0.606)	10.42*** (0.444)	10.56*** (0.374)	9.281*** (0.554)	9.655*** (1.384)
Tax Rate		0.00870 (0.0139)	-0.0290*** (0.00873)				
Tax rate * Dummy (developing = 0)		-0.0377** (0.0158)					
Tax rate * Dummy (developed = 0)			0.0377** (0.0158)				
Corruption Perception Index Governance Measure				-0.0967 (0.0753)	-0.0192** (0.00903)		
Infrastructure Ranking						0.0253* (0.0130)	
Mainland telephone lines							-1.50e-05 (0.00243)
Developing Dummy	-1.646*** (0.378)	-2.736*** (0.641)	-2.736*** (0.641)	-0.686* (0.374)	-0.448 (0.306)	-0.0889 (0.328)	-1.651 (1.090)
Unemployment Rate	-0.0196 (0.0341)	-0.0183 (0.0302)	-0.0183 (0.0302)	0.0366 (0.0287)	0.0373 (0.0274)	0.0299 (0.0271)	-0.0196 (0.0339)
Population	2.51e-05*** (6.20e-06)	2.44e-05*** (6.13e-06)	2.44e-05*** (6.13e-06)	2.59e-05*** (5.34e-06)	1.85e-05*** (4.14e-06)	2.08e-05*** (4.25e-06)	2.51e-05*** (6.46e-06)
GDP	3.98e-07 (4.43e-07)	4.90e-07 (4.28e-07)	4.90e-07 (4.28e-07)	4.26e-07 (3.50e-07)	4.59e-07 (3.72e-07)	4.32e-07 (3.49e-07)	3.98e-07 (4.44e-07)
Lagged Exports	0.00564 (0.00913)	0.00304 (0.00855)	0.00304 (0.00855)	0.0140*** (0.00404)	0.0120*** (0.00394)	0.0142*** (0.00429)	0.00564 (0.00887)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	716	716	716	293	238	238	716
R-squared	0.499	0.530	0.530	0.472	0.448	0.454	0.499

Clustered and robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Multiple Regressions with OECD Bilateral Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable: Log of FDI Stock							
Constant	7.712*** (0.267)	8.434*** (0.283)	8.434*** (0.283)	8.710*** (0.270)	8.512*** (0.253)	7.444*** (0.331)	7.712*** (0.267)
Tax Rate		-0.00929 (0.00881)	-0.0304*** (0.00553)				
Tax rate * Dummy (developing = 0)		-0.0211** (0.0103)					
Tax rate * Dummy (developed = 0)			0.0211** (0.0103)				
Corruption Perception Index				-0.135*** (0.0336)			
Governance Measure					-0.0308*** (0.00460)		
Infrastructure Ranking						0.0214*** (0.00681)	
Mainland telephone lines							0.00147** (0.000721)
Developing Dummy	-0.513*** (0.157)	-1.067*** (0.334)	-1.067*** (0.334)	0.118 (0.196)	0.144 (0.161)	0.235 (0.186)	0.0469 (0.312)
Unemployment Rate	-0.00520 (0.0126)	0.0121 (0.0128)	0.0121 (0.0128)	0.00253 (0.0137)	0.0278* (0.0151)	-0.00390 (0.0135)	0.000560 (0.0126)
Population	4.46e-06* (2.55e-06)	4.32e-06 (2.64e-06)	4.32e-06 (2.64e-06)	5.27e-06** (2.60e-06)	1.57e-06 (2.57e-06)	3.54e-06 (2.68e-06)	5.76e-06** (2.61e-06)
GDP	-5.00e-07*** (1.07e-07)	-3.36e-07*** (1.13e-07)	-3.36e-07*** (1.13e-07)	-4.66e-07*** (1.13e-07)	-3.81e-07*** (1.22e-07)	-4.50e-07*** (1.22e-07)	-4.82e-07*** (1.08e-07)
Lagged Exports	6.78e-06*** (6.83e-07)	6.39e-06*** (6.80e-07)	6.39e-06*** (6.80e-07)	6.46e-06*** (6.90e-07)	6.35e-06*** (6.86e-07)	6.09e-06*** (7.30e-07)	6.58e-06*** (6.97e-07)
Distance	-0.000116*** (1.54e-05)	-0.000110*** (1.56e-05)	-0.000110*** (1.56e-05)	-0.000123*** (1.55e-05)	-0.000141*** (1.53e-05)	-0.000126*** (1.51e-05)	-0.000113*** (1.55e-05)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Source Country Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4448	4448	4448	3834	3457	3457	4448
R-squared	0.660	0.668	0.668	0.681	0.700	0.691	0.662

Clustered and robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Testing for Different Developing/Developed Coefficients for Corruption and Governance with OECD Bilateral Data

	(1)	(2)	(3)	(4)
Dependent Variable: Log of FDI Stock				
Constant	8.729*** (0.275)	8.729*** (0.275)	8.721*** (0.267)	8.721*** (0.267)
Corruption Perception Index	-0.0999* (0.0590)	-0.143*** (0.00380)		
CPI * Dummy (developing = 0)	-0.0435 (0.0670)			
CPI * Dummy (developed = 0)		0.0435 (0.0670)		
Governance measure			-0.0145** (0.00668)	-0.0380*** (0.00550)
Governance * Dummy (developing = 0)			-0.0235*** (0.00804)	
Governance * Dummy (developed = 0)				0.0235*** (0.00804)
Developing Dummy	-0.121 (0.410)	-0.121 (0.410)	-0.431* (0.251)	-0.431* (0.251)
Unemployment Rate	0.00244 (0.0137)	0.00244 (0.0137)	0.0231 (0.0152)	0.0231 (0.0152)
Population	5.06e-06* (2.62e-06)	5.06e-06* (2.62e-06)	2.12e-06 (2.56e-06)	2.12e-06 (2.56e-06)
GDP	-4.64e-07*** (1.13e-07)	-4.64e-07*** (1.13e-07)	-3.74e-07*** (1.23e-07)	-3.74e-07*** (1.23e-07)
Lagged Exports	6.47e-06*** (6.90e-07)	6.47e-06*** (6.90e-07)	6.47e-06*** (6.88e-07)	6.47e-06*** (6.88e-07)
Distance	-0.000123*** (1.55e-05)	-0.000123*** (1.55e-05)	-0.000142*** (1.51e-05)	-0.000142*** (1.51e-05)
Year Dummies	Yes	Yes	Yes	Yes
Source Country Dummy	Yes	Yes	Yes	Yes
Observations	3834	3834	3457	3457
R-squared	0.681	0.681	0.702	0.702

Clustered and robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A-1: Countries (* indicates developing) and missing data¹⁴

Corruption Index 1995-2002		Infrastructure Index 1996-2002	
1	Argentina*	1	Argentina*
2	Australia	2	Australia
3	Austria	3	Austria
4	Belgium	4	Belgium
5	Brazil*	5	Brazil*
6	Canada	6	Canada
7	Chile*	7	Chile*
8	China*	8	China*
9	Colombia*	9	Colombia*
10	Costa Rica* ¹⁵		
11	Denmark	10	Denmark
12	Ecuador* ¹⁶		
13	Egypt* ⁷		
14	Finland	11	Finland
15	France	12	France
16	Germany	13	Germany
17	Greece	14	Greece
18	Guatemala* ¹⁷		
19	Honduras* ⁸		
20	Hong Kong	15	Hong Kong
21	Indonesia*	16	Indonesia*
22	Ireland	17	Ireland
23	Israel ¹⁸	18	Israel
24	Italy	19	Italy
25	Jamaica* ¹⁹		
26	Japan	20	Japan
		21	Korea, Republic
27	Luxembourg ⁶	22	Luxembourg
28	Malaysia*	23	Malaysia*
29	Mexico*	24	Mexico*
30	Netherlands	25	Netherlands
31	New Zealand	26	New Zealand
32	Nigeria* ⁹		
33	Norway	27	Norway
34	Panama* ²⁰		
35	Peru* ⁷		
36	Philippines*	28	Philippines*
37	Portugal	29	Portugal
38	South Africa*	30	South Africa*
39	Spain	31	Spain
40	Sweden	32	Sweden
41	Switzerland	33	Switzerland
42	Thailand*	34	Thailand*
43	Trinidad and Tobago* ¹¹		
44	Turkey*	35	Turkey*
45	United Kingdom	36	United Kingdom
46	Venezuela* ⁹	37	Venezuela*

¹⁴ Stocks of FDI are missing for Belgium and Luxembourg, therefore were not included in the tables above.

¹⁵ CPI is missing for 1995-1996.

¹⁶ CPI is missing for 1995-1997.

¹⁷ CPI is missing for 1995-1997, and 2000.

¹⁸ CPI is missing for 1995.

¹⁹ CPI is missing for 1995-1997, 2000-2001.

²⁰ CPI is missing for 1995-2000.

Table A-2
Data Sources

Variable	Further explanation	Source	Years
FDI ²¹	See footnote	UNCTAD; Bilateral OECD Data	1984-2002
Population	In 10,000s	World Development Indicator (WDI) 2006	1984-2002
GDP	In Current Dollars	World Development Indicator (WDI) 2006	1984-2002
Exports	Goods and services	World Bank	1984-2002
Tax Rate	The minimum of the BEA tax rate and statutory tax rate, where BEA tax rate= foreign income taxes/(foreign income tax + net income) of all affiliates for U.S. firms operating abroad in each country and year	Calculated with data from Bureau of Economic Analysis (BEA) and OTPR for statutory rate	1984-2002
Corruption Perception Index	Ranges from 0-10, with 10 denoting least corrupt	Transparency International	1995-2002
Government efficiency ranking	Broad ranking based on information from five areas: public finance, fiscal policy, institutional framework, business legislation, and societal framework.	IMD World Competitiveness Yearbook	1995-2002
Infrastructure Ranking	Broad ranking based on several factors including basic infrastructure (roads, other transportation infrastructure, health infrastructure, and others), technological infrastructure (telecommunications, computers, and so forth), energy self-sufficiency, and environmental infrastructure (waste treatment, etc).	IMD World Competitiveness Yearbook	1996-2002
Mainland telephone lines	Telephone lines connecting a customer's equipment to the public switched telephone network per 1,000 people.	World Development Indicator (WDI) 2006	1996-2002
Unemployment Rate	Total unemployment rate, % of total unemployed in total labor force	World Development Indicator (WDI) 2006	1984-2002
Distance	Geographic coordinates of capital cities	CEPII	

²¹ According to the UNCTAD definition, for associate and subsidiary enterprises, FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise (this is equal to total assets minus total liabilities), plus the net indebtedness of the associate or subsidiary to the parent firm. For branches, it is the value of fixed assets and the value of current assets and investments, excluding amounts due from the parent, less liabilities to third parties.

References

- Altshuler, Rosanne, Harry Grubert, and T. Scott Newlon, 2001, "Has U.S. Investment Become More Sensitive to Tax Rates?" in: James R. Hines, Jr. (editor), International Taxation and Multinational Activity, University of Chicago Press, 9-32.
- Asiedu, Elizabeth. 2002. "On the Determinants of Foreign Direct Investment in Developing Countries: Is Africa Different?" *World Development* 30:1, pp. 107-119.
- Auerbach, Alan J. and Kevin Hassett. (1993) "Taxation and Foreign Direct Investment in the United States: A Reconsideration of the Evidence," in Alberto Giovannini, R. Glenn Hubbard, and Joel Slemrod (eds.) Studies in International Taxation. Chicago: University of Chicago Press, 119-44.
- Bénassy-Quéré, Agnes, Nicolas Gobalraja, and Alain Trannoy. 2007. "Tax and Public Input Competition." *Economic Policy*. April 2007 pp. 385–430.
- Blonigen, Bruce and Miao Wang. 2004. "Inappropriate pooling of wealthy and poor countries in empirical FDI studies." NBER Working paper 10378.
- Boskin, Michael J. and William G. Gale. 1987. "New Results on the Effects of Tax Policy on the International Location of Investment." In The effects of taxation on capital accumulation, 1987, pp. 201-19, A National Bureau of Economic Research Project Report Chicago and London: University of Chicago Press.
- Buettner, T. 2002. "The Impact of Taxes and Public Spending on the Location of FDI: Evidence from FDI-flows within Europe." ZEW Discussion Paper No. 02-17, Mannheim.
- Cheng, Leonard and Yum Kwan. 2000. "What are the determinants of the location of foreign direct investment? The Chinese experience." *Journal of International Economics*. 51: 379-400.
- Cummins, Jason G. and R. Glenn Hubbard. 1995. "The Tax Sensitivity of Foreign Direct Investment: Evidence from Firm-Level Panel Data." In Martin Feldstein, James R. Hines Jr., and R. Glenn Hubbard eds. The Effect of Taxation on Multinational Corporations. Chicago: University of Chicago Press.
- Dharmapala, Dhammika and James Hines. 2009. "Which Countries Become Tax Havens?" *Journal of Public Economics*, Volume 93, Issues 9-10, Pages 1058-1068.
- Dollar, David, Mary Hallward-Driemeier, and Taye Mengistae. 2004. "Investment Climate and International Integration." Development Economics, World Bank. The World Bank, Policy Research Working Paper Series: 3323.
<http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN019818.pdf>
- Fatica, Serena. 2009. "Taxation and the quality of institutions: Asymmetric effects on

FDI.” EU Taxation Paper Number 21.

Gordon, Roger and James R. Hines, Jr. 2002. "International taxation," Handbook of Public Economics, in: A. J. Auerbach & M. Feldstein (ed.), Handbook of Public Economics, edition 1, volume 4, chapter 28, pages 1935-1995 Elsevier.

Grubert, Harry and John Mutti. 1991. "Taxes, Tariffs, and Transfer Pricing in Multinational Corporate Decision Making." *Review of Economics and Statistics*, 73, 285-293.

Hajkova, Dana, G. Nicoletti, L. Vartia, and K. Yoo. 2006. "Taxation, Business Environment, and FDI Location in OECD Countries." OECD Economics Department Working Paper No. 502.

Hartman, David G. 1984. "Tax Policy and Foreign Direct Investment in the United States." *National Tax Journal*, 37, 475-87.

Hines, James R., Jr. 1996. "Altered States: Taxes and the Location of Foreign Direct Investment In America." *American Economic Review* 86: 1076-1094.

Hines, James R., Jr. and Eric M. Rice. 1994. "Fiscal Paradise: Foreign Tax Havens and American Business." *Quarterly Journal of Economics*, February 1994, pp. 149-82.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi, 2009. "Governance Matters VIII: Aggregate and Individual Governance Indicators 1996–2008." World Bank Policy Research Working Paper #4978.

Kumar, Nagesh. 2001. "Infrastructure Availability, Foreign Direct Investment Inflows and Their Export-orientation: A Cross-Country Exploration." Research and Information System for Developing Countries, New Delhi, November 2001

Lipsey, Robert. 2002. "Home and Host Country Effects of FDI." NBER Working Paper #9293.

Loree, David W. and Stephen E. Guisinger. 1995. "Policy and non-policy determinants of U.S. equity foreign direct investments." *Journal of International Business Studies*. 26:2, pp. 281-299.

Madies, Thierry and Jean-Jacques Dethier, 2010. "Fiscal Competition in Developing Countries: A Survey of the Theoretical and Empirical Literature." World Bank Policy Research Working paper 5311.

Mutti, Jack and Harry Grubert, 2004. "Empirical asymmetries in foreign direct investment and taxation." *Journal of International Economics* 62 (2004) 337– 358.

Oates, Wallace. 1999. "An Essay on Fiscal Federalism." 1999. *Journal of Economic Literature*, Vol. 37, No. 3., pp. 1120-1149.

Ondrich, Jan, and Michael Wasilenko. 1993. "Foreign Direct Investment in the United States: Issues, Magnitudes, and Location Choice of New Manufacturing Plants." Kalamazoo, Mich.: W. E. Upjohn Institute for Employment Research, pp. ix, 159.

Swenson, Deborah. 1994. "The Impact of US Tax Reform on Foreign Direct Investment in the United States." *Journal of Public Economics*. 54 (2), 243–266.

Tiebout, Charles. 1956. "A pure theory of local expenditures." *Journal of Political Economy*. 64: 416-424.

Wei, Shang-Jin. 2000a. "How Taxing is Corruption on International Investors?" *Review of Economics and Statistics*. 82 (1): 1-11.

Wei, Shang-Jin. 2000b. "Local Corruption and Global Capital Flows." *Brookings Paper on Economic Activity*. 2: 303-354.

Wheeler, David and Ashoka Mody. 1992. "International Investment Location Decisions: The Case of U.S. Firms." *Journal of International Economics*. 33: 57-76.

Young, Kan H. 1988. "The Effects of Taxes and Rates of Return on Foreign Direct Investment in the United States." *National Tax Journal*, March 1988, v. 41, iss. 1, pp. 109-21.