Senior Project
Department of Economics

"The Effect of Corruption and Corporate Taxes on FDI"

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Abstract

This paper analyzes how an average effective corporate tax rate and a country's corruption score affect Foreign Direct Investment (FDI). The data for the tax rates comes from a survey conducted jointly by PricewaterhouseCoopers and Djankov, Ganser, McLiesh, Ramalho, and Schleifer (2010). The data contains all taxes that are imposed on "the same" mid-size domestic firm. This data makes it possible to include factors such as depreciation by looking at one standardized firm operating in many different countries and thus creating an "effective" tax rate that is able to be compared for all 85 countries in the study. This paper looks to add to the current literature by including an indirect tax, "corruption" while using this detailed tax data on low, middle and high income countries. It will then determine if the average effective tax rates and corruption variable are still as robust as past literature shows while including many controls. Finally it will assess if the impact of corruption and corporate taxes on FDI is more pronounced in lower and middle income countries than in higher income countries. [1]

[1] I would like to thank Dr. Francesco Renna and Dr. Mike Nelson for their guidance in writing this research paper.

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I. Introduction, Hypothesis, and Motivation

All governments try to attract FDI because it can create new jobs, bring in new technologies, and promote growth and employment. Romer (1993), argues that important "idea gaps" between rich and poor countries exist and that foreign investment can ease the transfer of technological and business knowledge to poorer countries. From this point of view FDI would boost the productivity of all firms in the host country and not only the ones receiving foreign capital. Corruption and corporate taxes are two measures that have been found to deter FDI. (See Djankov, Ganser, McLiesh, Ramalho and Shleifer (2010), King, Fullerton and Alworth (1984), Desai, Foley and Hines (2004), Al-Sadig (2009) and Wei (2000)). Governments should be very interested in controlling its tax policies as well as making sure it is not involved in any corrupt activities, such as bribery, in order to increase FDI.

This paper merges data on effective corporate tax rates for 85 countries (see Djankov et al 2010) with data on corruption. Corporate taxes and corruption have both been found in previous literature to negatively affect FDI. The theory behind why corporate taxes affect FDI is relatively straightforward. As the tax rate rises, the investor will receive a lower return because of the higher costs that taxes cause. Lower returns therefore lead to less investment. Corruption can be viewed in a similar light as that of the corporate taxes; as corruption in a country increases so does the amount of bribes and other costs to the investor. As costs to invest increase, return decreases, leading to less investment. Corruption has also been argued to be efficiency enhancing. In a paper written by Dreher and Gassebner (2012), they make the argument that corruption promotes efficiency by allowing private sector agents to bypass certain regulations. This paper hypothesizes that including the corruption variable in the data will explain some of the deterrence of foreign investment (see Al Sadig (2009) and Wei (2000)), along with what is

explained by the average effective tax rates. This paper will then go one step further and assess if the impact of corruption and corporate taxes on FDI is more pronounced in lower and middle income countries than in higher income countries.

The next section of the paper is a literature review of past applicable research. The paper then proceeds into the other sections: the data sources and descriptions, the model, the findings of the research, and the limitations and conclusion.

II. Literature Review

The study of the determinants of FDI is one that has long attracted economists. In the literature many factors have been shown to have an effect on FDI. Chakrabarti (2001) examines the robustness of the independent variables most commonly used in the literature on the determinants of FDI. He ranks the country's GDP per capita as the most likely to be correlated with FDI, followed by a country's openness to trade, wages, net exports, GDP growth rates, tax rates, tariffs and exchange rates.

King and Fullerton (1984) compared the effect of a marginal effective tax rate versus an average effective tax rate to better understand the effects of each tax on investment. This analysis is important because one can make two separate economic arguments for how taxes affect FDI. The argument for using an average effective tax rate is that it takes into account your average return on investment for the entire investment, defined as actual tax liability divided by pretax earnings. The argument for using a marginal effective tax rate is that it is more relevant if you are looking at incentives to save or invest at the present time period. This is because the marginal rate is only looking at the next dollar to be invested, defined as the change in the actual tax

liability divided by the change in pretax earnings. This paper uses tax data created by Djankov et al (2010) who remained agnostic about which tax rates to use, as does this paper.

The primary government finance independent variable in previous tax literature was corporate income taxes. The literature had less to say about the association between FDI and non-corporate income taxes, even though these taxes are large and have potential to affect FDI. Desai, Foley, and Hines (2003) were among the first to focus on indirect (non-income) taxes and their effects on FDI. They find evidence that indirect business taxes have an effect on FDI that is similar to the effect of corporate income taxes. Their data is from the Bureau of Economic Analysis (BEA). The data for the indirect tax rates is limited in the sense that the indirect tax rates are all mixed together. They have no way to identify whether the effect on FDI is the sales tax, property tax, labor tax or some other indirect tax. Djankov et al (2010) has the ability with their data set to separate the effect of these indirect taxes from one another. They also include these other tax variables in their paper but find that even with these variables as controls, corporate taxes remain significant. This paper uses the Djankov et al (2010) tax database and therefore also has the advantage of being able to separate the effect of the indirect tax rates.

Djankov et al (2010) collects their data from Pricewaterhouse Coopers accountants and tax lawyers. They describe a standardized business, "Taxpayer Co.", through an income statement and balance sheet and ask them to fill out the tax return. The income statement and balance sheet is developed by taking simple multiples of the country's gross national income (GNI) that Taxpayer Co will operate in. This process will be explained in greater detail in the data section below[2]. These multiples were chosen to be typical for a mid-size manufacturing firm. In the real world it is difficult to compare tax rates among firms because one could be more labor intensive than another and hence pays a higher payroll tax, for example. Conversely, a firm

[2] See Data Sources and Descriptions page 8

could have more machinery than another and therefore have a greater tax shield in the form of capital depreciation, lowering their overall taxable income. Additionally, a firm could be in an industry that has tax exemptions for the product that they are manufacturing and therefore lower their overall income tax. These examples all show the difficulty in trying to determine which factors are really influencing FDI since comparisons would not be equal from firm to firm based on industry alone. Since Djankov et al (2010) created this fictional company Taxpayer Co., and it operates with an identical business model in the ceramic flowerpots industry (an industry with no tax breaks in any country in the research), these concerns are eliminated. Djankov et al (2010) focuses on 85 different countries with wide ranges of income, providing a more informative look at the developing world.

Djankov et al. reports that most of the control variables have not made much of a dent into the effects of corporate taxes on FDI. The inclusion of all the control variables at once eliminates the statistical significance of the corporate tax variable, but the economic significance remains. None of the control variables appear to be as important as the corporate tax rates. Their empirical design cannot completely eliminate the concern that some other factor correlated with the corporate tax rate influences FDI (omitted variable bias). However they do find that corporate taxes have a substantial adverse effect on FDI, and one that persists with the wide range of controls that they used.

Other papers look at measures of corruption as a primary variable for FDI (see Wei (2000) and Al-Sadig (2009)). Al-Sadig (2009) finds that corruption deters foreign investors because it acts as an additional cost or a tax on profits. He uses a cross sectional and a panel data set on 117 countries to determine whether or not a corrupt host country receives less or more FDI inflows after controlling for other determinates of FDI. He argues that corruption is an

endogenous variable and that one must control for country-specific effects that are correlated with the level of corruption. In order to control for these effects, he uses a Fixed Effects (FE) model on the panel data set. Initially he starts with a cross-sectional analysis and has similar findings as past literature; corruption has a negative impact on FDI and is significant. Next, when he runs the Fixed Effects model he finds corruption to be significant but not as robust as using the cross sectional data with an Ordinary Least Squares (OLS) model. He explains this may be because of the correction for unobserved country-specific effects that the Fixed Effects model controls for. Al-Sadig does not use any tax rates in his model.

Wei (2000) examines the effects of corruption and taxation on FDI using bilateral FDI flow data from 12 source countries to 45 host countries. Using three different corruption variables, he finds that an increase in either the tax on multinational firms or the level of corruption in the host countries would reduce inward FDI. Wei finds that an increase in either corporate taxes or corruption would have a negative impact on FDI. Since Wei uses bilateral FDI, he can only look at the higher income OECD countries. This paper uses FDI inflows as the dependent variable which gives the opportunity to include low and middle income countries in the research, giving a better look at how corruption and taxes affect FDI in the developing world as well.

This paper will add to the current literature by using the detailed tax data from Djankov et al. and including it in the Al-Sadig model. This paper also looks to expand on the issue of corruption as not necessarily being an independent variable but an endogenous variable, similar to Al-Sadig's view. This is done by controlling for the collinearity between corruption and the log of GDP per capita. The log of GDP per capita is replaced in the model with a variable that excludes the influence of corruption. This will thus allow one to analyze the influence of

corruption without the effect of GDP per capita. Also, by removing the high income countries from the sample this paper will look to assess if the impact of corruption and corporate taxes on FDI is more pronounced in lower and middle income countries than in higher income countries.

III. Data Sources and Descriptions

The tax data for this paper has been provided by Djankov et al, (2010). This paper uses data covering the tax system effective in fiscal year 2004 and the sample consists of 85 countries including 27 high income countries, 19 upper-middle income, 21 lower-middle income, and 18 low income countries.

The data are constructed using a standardized case study of a business called TaxpayerCo (as mentioned previously). TaxpayerCo is a corporation operating in the city with the greatest population in each country. It is liable for taxes at all levels; national, state and local. TaxpayerCo makes ceramic flower pots. This is chosen because there is no industry-specific tax, making the data as comparable as possible between countries.

For labor tax purposes it is important to understand that TaxpayerCo employs 60 people: 4 managers, 8 assistants, and 48 workers. This number of employees is chosen because it is the worldwide average employment for firms in the World Bank's Enterprise Survey. For depreciation purposes TaxpayerCo bought all its assets on January 1st, 2004, the same day it started operations.

All the variables in the financial statements (i.e. sales, liabilities, etc.) were created by multiplying the country's income per capita (from the World Bank) times a factor. The factors were chosen as typical for a mid-size manufacturing firm. For instance, when creating the income statement for Taxpayer Co operating in the U.S., one would start with sales. The factor

chosen for sales is 1,050. The U.S. income per capita was $37,780. One would take the factor of 1,050 and multiply it by the U.S. income per capita of $37,780 to get a Sales figure of $39,669,000.

Once these pre-tax financial statements were created they were sent to PricewaterhouseCoopers office in Washington, D.C. and then distributed to the foreign country offices. The respondents in each country provided the full tax schedules for corporate income taxes, labor taxes, VAT and sales taxes, and other taxes. They also included data on the number of tax payments and how long it took to prepare, file, and pay the taxes. The offices also included all applicable deductions and exemptions including full depreciation schedules for TaxpayerCo's assets. Though this paper focuses on corporate income taxes, this data allows for the use of additional taxes and compliance cost data for robustness checks. Inflation is used as a control and data is gathered from the World Bank.

The data for this paper's other main variable of interest, corruption, was gathered by Transparency International (TI), an agency dedicated to fighting corruption worldwide. The index is scaled from 1 (most corrupt) to 10 (least corrupt). It is an average of different surveys and assessments from 10 independent institutions perceptions on the country's corruption. By averaging the surveys, it could potentially reduce types of measurement error. Each country has a different number of surveys that are used to calculate the country's corruption score. The control variables for corruption are motivated by the related existing literature and the availability of data. These variables include GDP, growth rate of population, degree of openness (measured by the sum of exports and imports as a percentage of GDP), a proxy for political risk, secondary school enrollment rates, and inflation. The data for these variables was gathered by the World Bank. Explanations of why these control variables were selected and what they are a proxy for

will be given in the model section below.[3]

IV. Model

Using the Djankov et al. (2010) and Al-Sadig (2009) papers and models as guidelines, this paper will estimate models on the effect of the average effective tax rates and corruption on FDI. Djankov et al. uses four measures of investment and entrepreneurship as dependent variables, while this paper is primarily only interested in one, FDI. They also use three different tax rates; a statutory corporate tax rate, a 1st year effective corporate tax rate, and a 5 year effective corporate tax rate as independent variables which are run separately do to the high correlation between these rates. They remain agnostic as to which rate to use, but find the 1st year effective corporate tax rate (ETR) as the most robust when including the control variables. This paper will use this finding and primarily focus on using the 1st year effective corporate tax rate (ETR) as the main corporate tax variable while including corruption as another variable of interest.

Other models that are used by Djankov et al use the same dependent variables but additional control variables are added as robustness checks. This paper uses a different dependent variable than Djankov et al but uses the same dependent variable used by Al-Sadig, FDI per Capita (FDIpc).

Since this paper estimates simple cross-country regressions, there is a risk that the results are deceitful. This is because of unobserved country-specific effects that would be controlled by a fixed effects model or omitted variables that could potentially bias the results. To partially address this risk this paper controls for many factors in the regressions. The control variables and methodology used by Djankov et al that this paper will also use in its model are below. First are

[3] Refer to Table 3 for data sources and Table 4 for descriptive statistics

the additional tax rates; VAT and sales tax (VAT_Sales_Tax), personal income tax- top marginal rate (PIT_Top_Rate), and Other_Taxes. These additional tax rates are important control variables because they help isolate the effect of the corporate tax rate, versus the corporate tax rate potentially picking up the effect of these other taxes if they are not included in the model. Second, theory predicts that inflation may influence investment because inflation is a proxy for economic stability. For instance, if inflation is extremely high or constantly changing, then the purchasing power of currency differs from one day to the next, causing uncertainty. In order to control for this issue, this paper uses the 10 year average inflation rate as a measure of long-run inflation.

The main controls used for the Corruption (Corrupt02) variable and the reasoning are below. Corruption and the controls are all lagged by one year to address the concern of endogeneity with FDI per capita. This paper uses the log of per capita GDP (lnGDPpc02), the growth rate of population (POP_Growth), and the growth rate of GDP (GDPGrowth) to control for the host country's market size and market potential. If a country's population is growing quickly, this may act as a spark for FDI inflows. The degree of openness variable (OPEN) is included in this paper and is expected to be positive. How open a country is to trade could be a proxy for how easy it is to do business with a country. Inflation (AVG_Inflation) is used to control for the country's economic stability as explained earlier in the paper. Secondary school enrollment ((SCHE) (% gross)) is used to control for the quality of human capital. As the school enrollment rate increases, one would assume a higher quality of human capital, making the expected coefficient positive. The stock of prior FDI as a percentage of GDP is used as a proxy for agglomeration effects (AGGLOM). Agglomeration literally means a "jumbled collection or mass". In this context agglomeration is alluding to all of the existing FDI stock in a country.

Foreign investors may be attracted to a country with large existing FDI stock; it could be used as a signal of a good investment environment. Finally, to control for political risk, a variable is used from the World Bank governance indicators (RISK). It reflects the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.

Basic regression of Foreign Direct Investment (FDI) on First Year Effective Corporate Tax Rate (1ETR), Corruption (lnCorrupt02) and other-potential control variables (X):

$$\text{lnFDIpc} = \beta_0 + \beta_1\, 1\text{ETR} + \beta_2\, \text{Corrupt02} + \beta_3\, \boldsymbol{X} + \mu$$

V. Results

Table 1 shows the most basic regression of the 1st year effective corporate tax rate and corruption on FDI with no controls.[4] The effect of both corruption and the1st year effective corporate tax rate are statistically significant and large. The estimates indicate that raising the 1st year effective tax rate by 1 percentage point reduces FDI per capita by 10 percent. While a 1 unit increase in a country's corruption score would reduce FDI per capita by 56 percent. These results suggest that both the corporate tax rate and corruption effect FDI.

The large parameter estimate in Table 1 raises a concern about spuriousness. This is most likely due to omitted variable bias. To address this problem and verify the robustness of the results, control variables are included in Table 2.[5] First this section will briefly discuss the effect that the controls have on FDI and whether it is in the expected direction. Then the robustness of the results for the two variables of interest (the effective corporate tax rate and corruption) will

[4] Table 1 is on page 15, located in the Appendix
[5] Table 2 is on page 16, located in the Appendix

be discussed. Finally the paper will explain potential two-way causality issues with corruption and the log of GDP per capita and how this paper attempts to control this issue.

LnGDPpc02- The parameter estimate for the variable is hypothesized to be positive. As GDP per capita in a country increases, there would be an expected increase in FDI per capita. For one reason, more GDP per person in a country would lead investors to believe there are more opportunities. The log of GDP per capita is statistically significant and as it increases by 10 percent, FDI per capita increases by 6.56 percent.

Other_Taxes- This variable would be hypothesized to be negative. One would expect that as any type of tax rate increases, FDI per capita would decrease. The other tax variable is statistically significant and as it increases by 10 percentage points, FDI decreases by 9 percent.

Agglom- This variable would be hypothesized to be positive. One would expect that as a country's FDI stock increases, FDI per capita would increase. FDI stock as a percent of GDP is statistically significant and as it increases by 10 percent, FDI increases by 1 percent.

From Table 2-Model 1, adding the control variables to the model caused a significant decrease in both corruption and the effective corporate tax rate. A 1 unit increase in a countries corruption now results in only a 5.6 percent decrease in FDI per capita, as opposed to a 56 percent decrease without the controls. Moreover the coefficient is no longer significant when including the control variables and makes it appear that corruption does not matter. However Marro in an IMF article titled, "Why Worry About Corruption?"[6] stated that, "it is not always clear whether corruption causes certain factors, or whether these factors or lack of them cause corruption. Although some attempts have been made to establish the correct direction of causal links, the issue of causality remains unresolved, and it is possible that variables may occasionally act simultaneously as both cause and effect." This leads to the belief that corruption may be a

[6] This article was part of an economic issues series and was "Economic Issues- No. 6"

function of per capita GDP, as well as per capita GDP possibly being a function of corruption. To control for the collinearity between these variables, Table 2- Model 2 uses the log of GDP per capita without the influence of corruption. This causes everything in the model to remain the same except for the corruption variable. It is increased by the amount that was being explained by GDP per capita and is now economically and statistically significant. An increase in corruption by one unit causes FDI per capita to decrease by 42.5 percent.

The 1st year effective tax rate on the other hand remains statistically significant. The control variables reduce the economic significance of this variable, but only slightly. A 1 percentage point increase in the 1st year effective tax rate decreases FDI per capita by 4.1 percent as opposed to the previous result of 10 percent.

Table 2-Model 3 looks includes only the low and middle-income countries in the model. The effect of corruption and corporate taxes both increase in this model. A one unit increase in corruption leads to a 68.1 percent decrease in FDI per capita as compared to a 42.2 percent decrease when the high income countries were included. While a one percentage point increase in the 1st year effective corporate tax rate leads to a 5.6 percent decrease in FDI per capita as compared to a 4.1 percent decrease when the high income countries were included.

VI. Limitations and Conclusions

This paper presents a basic relationship of corporate taxes and corruption on FDI for 85 countries. This paper has findings similar to past research in that corruption and corporate taxes both deter FDI. Though the data used is very detailed for the corporate tax rates and has many possible controls, a cross sectional data set is not the best indicator of how corruption affects FDI because it cannot account for the unobserved country specific effects with which the corruption

level is correlated. A panel data set would allow for a fixed effects model to be used to control for these unobservable effects. In addition, a 2 stage least squared model will be a better choice to correct for reverse causality between corruption and its controls. This paper adds to the past literature by showing the impact of corruption and corporate taxes on FDI as being more pronounced in lower and middle income countries than higher income countries while including a wide range of controls. Lower and middle income countries should be more aware of their tax rates as well as their countries levels of corruption in the future in order to attract FDI.

VII. Appendix

TABLE 1: REGRESSION RESULTS FOR 1st YEAR EFECTIVE CORPORATE TAX RATE and CORRUPTION
DEPENDENT VARIABLE: lnFDI per capita - 2003-2005

	Model 1 OLS		
Variab	Param Estim	Stnd error	
Intercept	3.83	.4018	
Corrupt_02	0.56	.0493	***
ETR	-0.10	.0158	***
Adjusted R-sq	**.6391**		
F Statistic (Model)	**71.84**		
# of observations used	**81**		

Note: Asterisks indicate significance:* 1% Level, **5% Level, *10% Level**

TABLE 2: REGRESSION RESULTS FOR 1st YEAR EFECTIVE CORPORATE TAX RATE and CORRUPTION with CONTROL VARIABLES
DEPENDENT VARIABLE: lnFDI per capita 2003-2005

	Model 1 OLS			Model 2 OLS- (residual lnGDPpc02)			Model 3 OLS- (Low-Middle Income Countries)		
Variab	Param Estim	Stnd error		Param Estim	Stnd error		Param Estim	Stnd error	
Intercept	-0.637	1.260		2.950	0.747		3.034	0.750	
ETR	-0.041	0.019	**	-0.041	0.019	**	-0.056	0.020	***
Corrupt02	0.056	0.110		0.422	0.118	***	0.681	0.079	***
lnGDPpc02	0.656	0.190	***						
rlnGDPpc02				0.656	0.190	***	1.067	0.099	***
Agglom	0.010	0.006	*	0.010	0.006	*	0.017	0.005	*
Risk	-0.110	0.146		-0.110	0.146		-0.035	0.156	
GDPGrowth	-0.028	0.030		-0.028	0.029		0.004	0.026	
OPEN	0.004	0.003		0.004	0.003		-0.001	0.003	
AVG_Inflation	0.003	0.005		0.003	0.004		0.007	0.003	**
SCHE	0.005	0.008		0.005	0.008		-0.009	0.005	*
POP_Growth	-0.215	0.149		-0.215	0.149		-0.265	0.137	*
Other_Taxes	-0.096	0.044	**	-0.096	0.044	**	-0.078	0.049	
Proc_Bus	-0.026	0.040		-0.026	0.040		0.020	0.031	
VAT_Sales_Tax	0.018	0.011		0.018	0.011		0.001	0.006	
Adjusted R-sq	.8011			.8009			.8368		
F Statistic (Model)	21.44			19.97			18.75		
# of observations read	67			67			46		

Note: Asterisks indicate significance:* 1% Level, **5% Level, *10% Level**

Table 3

Variable Definitions and Sources

Variable Name	Source	Definition
First-year effective tax rate (percent)	Calculation Djankov et al.	The tax rate obtained by dividing the total corporate tax TaxpayerCo pays by its pretax earnings
Five-year effective tax rate (percent)	Calculation Djankov et al.	The tax rate obtained by dividing the present-discounted value of the total corporate tax TaxpayerCo pays over five years by the present-discounted value of the pretax earnings in these five years.
Labor tax (percent)	Calculation Djankov et al.	The sum of all labor-related taxes payable by TaxpayerCo, including payroll taxes, mandatory social security contributions, mandatory health insurance, mandatory unemployment insurance, worker's compensation insurance contributions, and any local contributions that are proportional to payroll or number of employees. It is expressed as a percentage of pretax earnings.
Other taxes (percent)	Calculation Djankov et al.	The sum of all taxes payable TaxpayerCo other than corporate income taxes and labor taxes where the statutory incidence is on the firm. It is the sum of all property tax, business license tax, financial transactions tax, turnover tax, and asset and capital tax payable by TaxpayerCo. It is expressed as a percentage of pretax earnings.
VAT and sales tax	Calculation Djankov et al.	The sum of all consumption tax rates payable or collected by TaxpayerCo, including value added tax rate, sales tax rate, and turnover tax rate, and related surtaxes.
PIT top marginal rate	World Bank (World Development Indicators), PricewaterhouseCoopers and IBFD	The tax rate for the highest bracket of tax on personal income. Only taxes at the national level are included.\
Number of tax payments	World Bank (Doing Business data)	The tax payments indicator reflects the total number of taxes paid, the method of payment, the frequency of payment, and the number of agencies involved for this standardized case during the second year of operation. It includes payments made by the company on consumption taxes, such as sales tax or value added tax.
Corruption (CPI Score) 2002	Transparency International	CPI Score relates to perceptions of the degree of corruption as seen by business people and country analysts and ranges between 10 (highly clean) and 0 (highly corrupt).
FDI 2003-2005 per capita	World Bank (World Development Indicators)	Foreign direct investment is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor, divided by total population of the

		country.
CONTROL VARIABLES		
Tax Evasion	World Economic Forum (Global Competitiveness Report 2001-2002)	Executives' assessment of how important tax evasion is in their country (the lower the measure the more rampant is tax evasion). Based on table 6.11.
GDP per capita 2002	World Bank (World Development Indicators)	GDP per capita is gross domestic product divided by midyear population. Data are in constant U.S. dollars.
Procedures to start a business	World Bank (Doing Business data) Updates of Djankov et al. (2002)	This variable includes all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercial business.
Political Risk 2002	World Bank (Governance Indicators)	Reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
Average inflation 1995-2004	World Bank (World Development Indicators)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole, averaged over the period 1995-2004. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. World Bank national accounts data and OECD national accounts data files.
GDP Growth Rate (2002)	World Bank (World Development Indicators)	
Population Growth 2002	World Bank (World Development Indicators)	Change in the population over time, measured in percent form.
Openness 2002 (Trade % of GDP)	World Bank (World Development Indicators)	Sum of Exports and Imports as a % of GPD
School Enrollment, Secondary (% Gross)	World Bank (World Development Indicators)	Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown.
Agglomeration		

Table 4- Table of Descriptive Statistics

Variable	Brief Description	N	Mean	Std	Min	Max
lnFDIpc	Log FDI per capita 2002	83	4.63	1.90	0.18	8.29
ETR	Effective Tax Rate	85	17.44	6.71	0	39.87
Corrupt02	Corruption 2002	83	4.57	2.37	1.6	9.7
SCHE	School Enrollment %	76	84.20	30.82	7.36	158.27
Other_Taxes	Other Taxes	85	1.71	2.78	0	17.58
VAT_Sales_Tax	VAT and Sales Tax	85	17.10	8.32	0	73.54
Proc_Bus	Procedures to start a business	84	9.19	3.52	2	17
AVG_Inflation	Average Inflation (1995-2004)	84	13.01	20.51	-0.89	118.33
Risk	Political Satability	83	2.59	0.95	0.49	4.16
POP_Growth	Population Growth % (2002)	84	1.04	1.05	-1.50	3.19
lnGDPpc02	Log GDP per capita 2002	84	8.05	1.59	5.39	10.65
OPEN	Trade as a % of GDP	83	80.30	51.96	21.42	360.58
GDPGrowth	GDP Growth Rate	84	2.84	4.12	-12.67	13.19
Rlngdppc02	Residual	81	2.2 E-15	0.86	-2.13	1.69
Agglom	Agglomeration	83	35.53	33.62	0.71	205.32

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IX. SAS Code

```
data tax_data;
set dare.tax_data;
data corruption;
set dare.corruption;
data WBank2002;
set dare.WBank2002;
proc sort data=tax_data;
by code;
proc sort data=corruption;
by code;
proc sort data=WBank2002;
by code;

data Wbank2002_tax_corruption;
merge tax_data corruption Wbank2002;
by code;

rename FDI_Per_Capita__2003_2005_=FDIpc;
rename _st_Year_Effective_Tax_Rate=ETR;
rename Corruption__2003_=Corrupt_03;
rename Statutory_Corporate_Tax_Rate=Statutory_TR;
rename __Year_Effective_Tax_Rate=Five_yr_ETR;
rename FDI_2003_2005_as___of_GDP=FDI_GDP;
rename Number_of_tax_payments=Number_Payments;
rename Procedures_to_start_a_business=Proc_Bus;
rename VAT_and_Sales_Tax=VAT_Sales_Tax;
rename PIT_top_marginal_rate=PIT_Top_Rate;
rename IEF_Property_Rights_Index=IEE_Index;
rename GDP_pc_2003=GDPpc03;
rename GDP_per_capita__2002_=GDPpc02;
rename Employment_rigidity_index=Empl_Rigid_Index;
rename EFW_Freedom_to_Trade_Internation=Freedom_Trade_Index;
rename Average_inflation__1995_2004_=AVG_Inflation;
rename POP_Growth____2002_=POP_GROWTH;
rename Heritage_Openness_Measure__2002_=Heritage_Open;
rename Corruption__2002_=Corrupt02;
rename Trade___of_GDP=OPEN;
rename GDP_Growth_Rate__2002_=GDPGrowth;
rename School_Enrollment__2002_=SCHE;
rename GDP__2002_=GDP02;
rename Political_Stability__2002_=Risk;
rename AGGLO=AGGLOM;


lnFDIpc=log(FDI_Per_Capita__2003_2005_);
lnGDPpc02=log(GDP_per_capita__2002_);
lnGDP02=log(GDP__2002_);
lnCorrupt02=log(Corruption__2002_);
lnNumber_Payments=log(Number_of_tax_payments);
```

```
lnFreedom_Trade_Index=log(EFW_Freedom_to_Trade_Internation);

run;

proc reg;
   model lngdppc02=corrupt02;
   output out=a2 r=rlngdppc02;
   run;

data dare.a3;
      set dare.a3;
      if Income_group="High income" then delete;
      run;

proc means;
var sche lngdppc02 Corrupt02 Risk GDPGrowth OPEN AVG_Inflation SCHE
POP_Growth ETR Other_Taxes Proc_Bus VAT_Sales_Tax PIT_TOp_Rate rlngdppc02
agglom;
run;

proc corr;
var sche lngdppc02 Corrupt02 Risk GDPGrowth OPEN AVG_Inflation SCHE
POP_Growth ETR Other_Taxes Proc_Bus VAT_Sales_Tax PIT_TOp_Rate rlngdppc02
agglom;
run;

proc univariate data = Wbank2002_tax_corruption;
var corrupt02 lncorrupt02 GDP02 lnGDP02;
histogram;
run;

proc reg;
model lnFDIpc=Statutory_TR;
model lnFDIpc=Five_yr_ETR;
model lnFDIpc=ETR;
model lnFDIpc=Corrupt02;
model lnFDIpc=Corrupt02 ETR /white;

run;

proc reg data=dare.a2;
model lnFDIpc=lnCorrupt02 OPEN ETR lnGDPpc02 Other_Taxes POP_Growth Proc_Bus
VAT_Sales_Tax Pit_Top_rate AVG_Inflation;
model lnFDIpc=lnCorrupt02 Freedom_Trade_Index ETR lnGDPpc02 Other_Taxes
POP_Growth Proc_Bus VAT_Sales_Tax Pit_Top_rate AVG_Inflation;
model lnFDIpc=lnCorrupt02 OPEN lnFreedom_Trade_Index ETR lnGDP02 Other_Taxes
POP_Growth Proc_Bus VAT_Sales_Tax Pit_Top_rate AVG_Inflation;

model lnFDIpc=ETR Corrupt02 lngdppc02 agglo Risk GDPG OPEN AVG_Inflation SCH
POP_Growth Other_Taxes Proc_Bus VAT_Sales_Tax /white;
model lnFDIpc=ETR Corrupt02 rlngdppc02 agglo Risk GDPG OPEN AVG_Inflation SCH
POP_Growth Other_Taxes Proc_Bus VAT_Sales_Tax /white;

proc reg data=dare.a3;
model lnFDIpc=ETR Corrupt02 lngdppc02 agglom Risk GDPGrowth OPEN
AVG_Inflation SCHE POP_Growth Other_Taxes Proc_Bus VAT_Sales_Tax /white;
```

```
model lnFDIpc=ETR Corrupt02 rlngdppc02 agglom Risk GDPGrowth OPEN
AVG_Inflation SCHE POP_Growth Other_Taxes Proc_Bus VAT_Sales_Tax /white;


run;
quit;
```