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Bureaucratic Corruption, MNEs and FDI

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Abstract

This paper adds to the limited number of studies analysing the relationship between host country corruption and FDI inflows. A model describes the incentives foreign MNEs and host country bureaucrats have for engaging in corruption and shows how corruption increases the MNE costs of operations in the host country. The model predicts that the costs caused by corruption reduce FDI inflows. Regression analysis using panel data finds that host country corruption has a significant negative effect on FDI inflows to developing economies but not for developed economies.

Keywords: corruption, foreign direct investment, multinational enterprises

JEL classifications: F21, F23, D73

1. Introduction

When a good or a service changes ownership from one economic agent to another there is always a possibility that either part will try to benefit by breaking the contract between buyer and seller. What can be done to minimise the risk of such opportunistic behaviour? The developed economies have responded to this fundamental problem through developing complex institutional frameworks during a long historical process. North (1991) claims that ‘institutions are the humanely devised constraints that structure political, economic and social interaction’. Institutions in the form of property rights, codes of conduct, laws, traditions and the like have been devised in order to decrease the uncertainty of exchange and allow for individuals, firms and organisations to interact efficiently. The transition and the developing economies have generally not come as far as the developed economies in building efficient market economy institutions. In this paper we start by arguing that the existence of wide spread corruption in many developing and transition economies is a result of the lack of functioning market economy institutions. Corruption is an informal institution that can develop when other institutions such as property rights are weak. While many sources point to the existence of corruption in developing economies, reliable figures for the cost of corruption are less common. However, it has been suggested that corruption and government inefficiency cost Bangladesh 450 million USD a year, truly a tremendous amount of money for an economy that the UN has classified as one of the least developed (Transparency International, 2004a).

Multinational enterprises (MNEs) that contemplate foreign direct investment (FDI) have to take the host country characteristics into account, including the quality of institutions and the existence of corruption. Corruption can take many different forms but for the purposes of this paper we focus on corruption that affects the costs of MNE activity in a host country. We use the term *bureaucratic corruption* to describe a form of corruption where corrupt behaviour among government bureaucrats results in increased costs for MNE operations. Bureaucratic corruption should result in high transaction

costs that increase the MNEs' costs of doing business in the host country. An example of corruption imposed costs is when corrupt government bureaucrats demand side payments to provide an export license. Such expenses decrease the expected profitability of MNE entry and tend to deter foreign investors from starting activities in the host country. Host country corruption should therefore have a negative effect on the size of FDI inflows.

The aim of this paper is to add to the limited number of studies of the relationship between MNE operations as reflected by FDI inflows and host country corruption. Firstly, the relationship between FDI and corruption is analysed in a model that describes the interaction between MNEs and host country bureaucrats. The contribution of the model is that it describes the incentives for engaging in corruption and how corruption increases the cost of MNE activity. The increase in costs is expected to have a negative effect on FDI inflows. Secondly, an empirical analysis using panel data is performed in order to determine whether the predictions of the model can be verified and that host country bureaucratic corruption indeed tends to reduce the volume of FDI inflows that the host country receives. The empirical analysis also investigates whether there is a difference in the effect of host country corruption on FDI inflows between developed and developing economies.

The number of papers investigating the relationship between host country corruption and FDI inflows is quite limited. Furthermore, the results are not conclusive. Mody and Wheeler (1992) failed to find a significant relationship between corruption and FDI using data for U.S. FDI flows. Similarly, Hines (1995) did not find a significant negative relationship between total FDI inflows and host country corruption. However, Hines found that the growth rate of FDI inflows to corruption prone economies fell after U.S. legislation was introduced which imposed criminal penalties for corrupt payments. Henisz (2000) uses firm-level data for U.S. MNEs to analyse market entry and finds some evidence that corruption actually increases the likeliness of MNE entry.

However, there are also studies that suggest that host country corruption reduces FDI inflows. Firm-level data for firms investing in Eastern Europe and the former Soviet Union is used by Smarzynska and

Wei (2000). They find that host country corruption lowers the probability of investment. Wei (2000a) studies whether host country corruption affects the ability to attract FDI. Using three different indices to measure corruption Wei finds that corruption has a significantly negative effect on FDI inflows. Wei (2000b) investigates the link between corruption and the composition of capital inflows. The study controls for host country policies toward FDI and finds that corruption substantially reduces foreign direct investment because the composition of capital inflows is distorted away from FDI. Hakkala et al. (2005) use firm-level data on Swedish MNEs to investigate the effects of corruption on FDI. The paper concludes that corruption decreases the probability of investment. However, Hakkala et al. (2005) also find that the effects of corruption are asymmetric. Corruption decreases MNE affiliate sales to the local market as a result of a smaller cost increase for local firms but increases exports to the home market when corruption can reduce taxation or costs of regulation.

The structure of this paper is as follows: Section 2 provides a background discussion of the relationship between MNEs and institutions and our definition of bureaucratic corruption. The section also describes the chosen measure of corruption that is used in the empirical analysis and provides some descriptive data for the level of corruption in different regions. Section 3 develops the theoretical model that serves as a microeconomic foundation for the empirical analysis. Section 4 presents the empirical work. Section 5 concludes.

2. Bureaucratic corruption and MNEs

2.1 Institutions and corruption

What is the link between institutions and corruption? The exchange of goods and services gives rise to transaction costs. Transaction costs come in many forms and include negotiation costs, search costs, surveillance costs and enforcement costs. The cost of information is fundamental for the existence of

transaction costs. North (1990) claims that the main function of institutions is to reduce the transaction costs in the economy. The advantage of institutions is that they put constraints on the behaviour of economic agents and reduce the risk of opportunistic behaviour. Institutions can be formal or informal. Formal institutions include laws and regulations that should help to reduce the costs of surveillance and enforcements of contracts as well as negotiation costs. Informal institutions are restrictions that economic agents put on their own behaviour and that have developed in order to structure human interaction. The business culture in an economy is an example of an informal institution. Both formal and informal institutions are important for restricting the behaviour of agents.

North (1990) argues that while the purpose of institutions is to reduce transaction costs, there are also institutions that in fact cause transaction costs to increase. When a well-developed institutional framework is lacking, the void is instead filled by informal institutions. Following this line of reasoning, we claim that corruption is an informal institution that arises as a result of a lack of functioning market economy institutions and that corruption affects the transaction costs in the economy. Accordingly, corruption is a result of, rather than a cause for, an underdeveloped institutional framework. Using Putnam's (1993) reasoning that absence of social capital tends to be self-reinforcing, it is possible to argue that a vicious circle could develop as corruption leads to distrust between economic agents and increases in exploitation and uncertainty.

Several different definitions of corruption are possible. In this paper, we exclude political corruption where the gain of the corrupt behaviour is political power. For the purposes of this paper, we are primarily interested in corruption that affects the profitability of MNE operations in a host country and hence influences the MNE decisions about possible foreign direct investment. MNEs need to interact with various host country organisations, including the government and its bureaucracy. Government bureaucrats have the opportunity of trying to bend or even break rules and regulations for personal gain. They can use their bureaucratic influence to collect side-payments from individuals or firms. It is this type of corruption rather than political corruption that should have the strongest effect on MNE activities in the

host country. We claim that it is this form of corruption that primarily affects the operations of an MNE. We name such behaviour *bureaucratic corruption* and define it as ‘bureaucratic behaviour in order to extract personal monetary gain resulting in an increase in the costs of government services that MNEs need to start operations in the host country’. Bureaucratic corruption also creates uncertainty that tends to increase the costs of MNE activities. The fact that an MNE pays a bribe is not a guarantee that it actually receives the government service it needs. For an MNE, the result is that the costs of operating in the host economy increases. We argue that when market economy institutions are underdeveloped, they fail to fulfil their function of reducing uncertainty and arbitrariness, and the existence of uncertainty increases the power of bureaucrats and the probability that they will engage in corrupt behaviour.

How can opportunities for bureaucratic corruption be exemplified and explained? For example, the lack of developed formal institutions creates arbitrariness for the interaction between bureaucrats and MNEs. When formal institutions are underdeveloped or cannot be enforced, the influence of government bureaucrats increases. When institutions fail to restrict the behaviour of bureaucrats, these individuals have the opportunity to develop informal institutions that include corrupt behaviour. Arbitrariness in interpreting and enforcing laws and regulations creates an uncertainty that bureaucrats can take advantage of in order to extract monetary gains for themselves. Arbitrariness allows bureaucrats to interpret regulations and laws in a way that put MNEs as well as domestic firms at a disadvantage when interacting with bureaucrats. Opportunities for bureaucratic corruption may even be the very reason for establishing arbitrary and confusing regulations in the first place, an idea put forth by Bardhan (1997) as well as Rose-Ackerman (1978) and Tanzi (1998). Flatters and Macleod (1995) provide empirical evidence from Indonesia.

Furthermore, it can be assumed that both developing and transition economies have institutions that are less market-economy oriented than developed economies. The developing economies are still to a large extent based on a traditional economic system, while the transition economies are in the process of replacing a system based on planned economy by a market economy. Therefore, bureaucratic corruption

should be particularly severe in developing and transition economies.¹ Section 2.3 presents data that support this argument.

2.2 How to measure corruption: the Corruption Perceptions Index

Since corruption is illegal in most economies, it is very difficult to find data that directly measure this phenomenon. Objective data such as the number of corruption convictions raise many questions about validity and can be misleading. The fact that a country has few or no convictions of corruption could have several explanations. One explanation is that corruption indeed is a minor problem. However, it can also be the case that the number of convictions is low due to an inefficient law administration or a forgiving attitude towards corruption. Therefore, in order to provide a more correct picture, corruption has to be measured indirectly using subjective rather than objective data.

There are several different indices of corruption available.² The existing indices are highly correlated; Wei (2000a) reports a correlation coefficient of 0.89 for two of the indices. The corruption indices are based either on surveys of business people or on studies by country analysts or a combination of both. The advantage of surveying business people is that these individuals have a first-hand experience of how corruption affects actual business operations. A potential problem of corruption measures is that these might rather work as indicators of general host country institutional quality. However, as we have argued earlier, there should indeed be a strong link between the lack of market economy institutions and the existence of corruption.

In this paper, we have chosen to use Transparency International's³ Corruption Perceptions Index (henceforth, TI) as our measure of host country corruption. The difficulties in measuring corruption discussed above merit a description of the TI. The TI has been reported since 1995 and the number of countries covered has gradually increased. In the 2004 survey, 146 countries were included. The TI ranges

¹The fact that many bureaucrats in developing economies have very low salaries would tend to increase the severity of corruption.

²Wei (2000a) describes the Business International corruption measure and the International Country Risk Group (ICRG) measure of corruption.

³Transparency International is a non-governmental organisation with the aim of curbing corruption. It was founded in 1993 and has over 90 offices globally.

from 0 to 10, where 10 equals a perfectly clean country while 0 indicates a country where business transactions are entirely dominated by corruption. The TI is a composite index and is constructed from several different sources in the form of surveys of business people as well as assessments by country analysts. 18 different sources were used for the 2004 survey. Assessments from the three previous years are combined to reduce variations.

We believe that the TI is a reasonable proxy for the extent of bureaucratic corruption in a country. The inclusion of surveys of business people in the TI should imply that corruption effects on business operations are taken into account. It is also important to remember that the TI is a measure of *perceived* rather than real corruption. Transparency International and the University of Passau (2004) describe the construction of the TI in detail.

2.3 Perceived corruption

It might be instructive to try to give a general description of the extent of corruption in different regions. Table 1 presents the Corruption Perceptions Index as well as the inward stock of FDI for regions and country groups. In Section 2.1, we argue that bureaucratic corruption develops when there is a lack of functioning market economy institutions. If this argument has any truth to it, developing economies and transition economies should score low on the TI. We have also argued that host country corruption increases MNE costs. Therefore, those country groups and regions that score low on the TI should only attract limited MNE activity in the form of FDI inflows.

Table 1 Transparency International's Corruption Perceptions Index

Region / country	TI score averages 2004	Inward stock of FDI per capita 2000, USD
<i>Region</i>		
Scandinavia ^a	9.28	10 065
EU-15	7.69	5 927
Central and Eastern Europe ^b	4.51	1 200
South East Asia ^c	3.93	375
South America ^d	3.61	1 102
Africa ^e	2.87	215
CIS ^f	2.36	140
<i>Country groups</i>		
Developed ^g	7.94	4 675
Transition ^h	3.28	387
Developing ⁱ	3.26	421
Least developed ^j	2.62	26

Source: TI score averages are based on Transparency International (2004b). FDI stocks per capita are based on FDI data from UNCTAD (2003) and population data from Penn World Tables.

Notes:

a: Denmark, Iceland, Norway and Sweden.

b: Includes Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

c: Includes Bangladesh, China, Hong Kong, India, Indonesia, South Korea, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka and Thailand.

d: Excluding Guyana and Suriname.

e: Includes Algeria, Benin, Cameroon, Chad, Congo (rep.), Egypt, Ethiopia, Gambia, Ghana, Ivory Coast, Kenya, Madagascar, Malawi, Mali, Morocco, Mozambique, Niger, Nigeria, Seychelles, Senegal, South Africa, Tunisia, Uganda and Zimbabwe.

f: Includes Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

g: Includes the countries in the EU-15 group and Australia, Canada, Iceland, Israel, Japan, New Zealand, Norway, Switzerland and the U.S.

h: Includes the countries in the Central and Eastern Europe and CIS groups.

i: Includes the countries in the South East Asia, South America and Africa groups and the Dominican Republic, El Salvador, Guatemala, Honduras, Iran, Lebanon, Mexico, Nicaragua, Panama, Syria and Yemen.

j: Includes Bangladesh, Benin, Chad, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Senegal and Uganda.

The data in Table 1 seem to support our arguments. The developing, transition and least developed economies have a much higher perceived corruption than the developed economies. As far as the different regions are concerned, Table 1 suggests that corruption in Africa and the CIS is perceived to be higher than in Asia, South America and Eastern Europe. Scandinavia has the lowest perceived corruption.

The inclusion of inward stocks of FDI in the table provides an indication of the relationship between FDI and corruption. Regions and country groups which have more severe problems of corruption also tend to have smaller stocks of inward FDI possibly resulting from high MNE operation costs caused by

corruption. Our hypothesis is that host country corruption tends to deter FDI inflows. The data presented in Table 1 provide some tentative evidence that this hypothesis is correct. In Section 4 a formal test of this hypothesis is performed. In the following section we develop a model to allow for a more formal analysis of the link between host country corruption and FDI inflows.

3. Modelling MNEs, bureaucrats and bureaucratic corruption

The objective of this section is to develop a model that provides a microeconomic foundation for an analysis of the relationship between bureaucratic corruption and FDI inflows. The model provides hypotheses that are tested in Section 4.

3.1 Bureaucrats and MNEs

Corruption affects economies in several different ways, but in this paper we are primarily interested in the effect of corruption on direct investments. Therefore, in order to further investigate this relationship, we try to develop a theoretical model that focuses on the effect of host country bureaucratic corruption on MNEs' willingness to invest. It is possible to compare corruption with a tax and thus analyse the costs. However, a difference between the two is that the 'rules' of corruption normally are assumed to be less transparent than tax laws and therefore also results in an extra cost due to uncertainty. It is impossible to legally enforce the agreement between briber and bribed. Corruption is arbitrary and causes uncertainty. The amount of uncertainty probably differs on an individual basis but perhaps more importantly on the country level. The East-Asian economies have managed to achieve very high rates of economic growth despite high levels of corruption. An explanation for this may be that different types of corruption have different effects on growth. A study by Campos et al. (1999) suggests that due to the predictability of corruption in the East Asian economies, the negative effects of corruption on investments have been smaller than could be expected. Wei (1997) finds a similar result with the uncertainty resulting from corruption being more damaging than the actual level of corruption for the inflow of foreign direct investments.

We proceed to model the existence of bureaucratic corruption and the resulting cost. Our model has two types of agents, bureaucrats and MNEs. We also assume that the bureaucrat has a monopoly in providing government services that the MNE needs in order to operate in the host country. This can be done without personal costs for the government bureaucrat. Equations (1i) and (1ii) simply state that there will only be corruption if the expected revenue is higher than the expected costs for both agents involved.

$$\text{Corruption if} \quad \chi \geq c \quad (1i)$$

$$\text{No corruption if} \quad \chi < c \quad (1ii)$$

where χ is an agent's revenue payoff from corruption and c is the expected cost. For corruption to take place $\chi \geq c$ for all involved agents. Equations (2i) and (2ii) present revenue functions for the two types of agents.

$$\text{Revenue for MNE} \quad \chi_{MNE} = \beta\phi \quad (2i)$$

$$\text{Revenue for bureaucrat} \quad \chi_{BUR} = \eta \quad (2ii)$$

where β is the probability that the bureaucrat indeed delivers the government service, ϕ signifies the value of the government service for the MNE and η is the monetary value of the bribe. The revenue of corruption is simply the monetary value an agent can earn by realising the action. An example of the payoff for an MNE that engages in corruption could be the future cash flow connected to a building contract granted by the bureaucrat. For a bureaucrat, the revenue of corruption is the size of the bribe. The probability variable β has been discussed by Shleifer and Vishny (1993), among others and can be used to distinguish bribes from taxes. Shleifer and Vishny (1993) distinguish between centralised and decentralised corruption. Centralised corruption implies that only a single agent in the economy collect bribes. Decentralised corruption can be a result of a weak central government. Bureaucrats and agencies can, therefore, collect bribes independently from each other.

Therefore, even when having paid a bribe, there is still a possibility that the MNE does not get access to the government service that it wants, which forces the MNE to pay yet another bribe to receive the government service. This explains how corruption introduces an element of uncertainty for the MNE. For an economy where centralised corruption dominates, we would expect β to be close to one while decentralised corruption would imply a value of β that is closer to zero.

3.2 The costs of corruption

What costs of engaging in corruption are the two types of agents exposed to? In our model, we introduce three different costs that are related to corruption activities. To begin with, the briber obviously incurs the bribe as a cost for engaging in corruption. This cost only appears for one of the agents in the corruption process. However, there is also a probability that both agents are revealed as being corrupt. This fact gives rise to two further costs. Firstly, we assume that being revealed as dealing with corruption implies that the agent is exposed to a cost for legal punishment. Secondly, the culture in the host country can be assumed to be more or less hostile towards corrupt practices. This implies that in addition to the legal cost there also exists a ‘social’ cost of being revealed as engaging in corruption.⁴ In economies where corruption is frowned upon the social cost should be higher and, consequently, there should exist less corruption than in an economy where corruption is more accepted as a part of the existing business culture.

The general cost function for an agent that engages in corruption is represented by Equation (3) and tries to take the discussion above into account. The general cost function is:

$$c_j = ((\delta + \alpha)\mu) + \eta \quad (3)$$

⁴For example, the public may perceive an MNE in a different way after it has been revealed as using corrupt practices.

where c_j is the cost of the j :th bribe with j going from 1 to n , μ signifies the probability of being caught going from 0 to 1, the legal punishment cost is denoted δ , while α represents the ‘social cost’ of being revealed as engaging in corrupt behaviour and η is the monetary value of the bribe.

As described above, for the bribed $\eta = 0$ while $\eta > 0$ for the briber. The legal punishment cost, δ , increases along with a hostile attitude towards corruption in the legal system. The social cost of corruption, α , goes from 0 to infinity where a low value signifies that corrupt behaviour is widely accepted and a high value signifies a culture with a strong aversion against corruption. Similar cost components of corruption for the individuals can be found in Sen (2001).

Equation (3) can be used to provide an explanation for the large differences in severity of corruption between developed and developing economies as indicated by Table 1. It can be argued that the legal punishment cost, the social cost of corruption and the probability of being caught are all positively correlated. In the developed economies corruption is frowned upon and not accepted as a normal part of the business culture. Accordingly, in developed economies the legal cost of punishment should be high to discourage behaviour that is unacceptable to society. In line with this argument, the probability of getting caught should also be high. The positive relationship between these variables implies that the cost for an agent that engages in corruption as described by Equation (3) is likely to be high in a developed economy. However, in developing economies we have the opposite situation: corruption is more acceptable as a part of the business culture. Consequently, the legal punishment cost and the probability of getting caught should be lower, decreasing the costs of engaging in corruption.

The social cost of corruption may be lower in countries with more hierarchal religions such as Islam since it is less accepted to challenge those above you in the hierarchy (Triesman, 1999). Furthermore, countries with hierarchical religions tend to have stronger family ties (Triesman, 1999). It can also be the case that in cultures where the distinction between bureaucrats’ private and official power is blurred, bribery may have lower social costs.

The probability of being caught, μ , is determined by the effectiveness of the police and the legal system. La Porta et al. (1998) argue that countries with common law as the origin of the legal system are better protected against corruption, since the legal system has stronger property rights. But the enforcement of the laws is equally important. Triesman (1999) finds that common law should have had a stronger influence for countries that have been under British rule. By taking the first derivative of Equation (3) with respect to δ we get the sensitivity of punishment. The legal punishment should be highly dependent on surveillance and enforcement (μ) to have a deterrent effect on corruption in a country. Many developing countries have all the laws and regulations demanded from the international society regarding corruption but suffer from a severe lack of enforcement of existing laws. Thus, those laws have little effect on the existence of corruption.

In order to develop the model, we have to combine the cost and revenue functions described above in order to determine whether corruption takes place. We have rewritten Equation (1) by incorporating Equations (2) and (3), resulting in one set of equations for the MNE and one set for the bureaucrat.

MNE

$$\text{No corruption if:} \quad \beta\phi - ((\delta + \alpha)\mu) - \eta < 0 \quad (4i)$$

$$\text{Corruption if:} \quad \beta\phi - ((\delta + \alpha)\mu) - \eta \geq 0 \quad (4ii)$$

$$\text{Expected profit:} \quad \pi_{MNE} = \beta\phi - ((\delta + \alpha)\mu) - \eta \quad (4iii)$$

Bureaucrat

No corruption if: $\eta - ((\delta + \alpha)\mu) < 0$ (5i)

Corruption if: $\eta - ((\delta + \alpha)\mu) \geq 0$ (5ii)

Expected profit: $\pi_{BUR} = \eta - ((\delta + \alpha)\mu)$ (5iii)

Using (4iii) and (5iii) to solve for the size of the bribe yields:

$$\frac{\beta\phi}{2} = \eta \quad (6)$$

Thus, for corruption to take place:

$$\frac{\beta\phi}{2} \geq (\delta + \alpha)\mu \quad (7)$$

that is, revenue must be at least twice as large as the expected punishment and social cost. If not, the MNE would make a negative profit and thus choose not to engage in corruption. The size of the bribe is therefore endogenously determined by cost and revenue. This is only valid if we assume that all of the cost variables δ, α, μ as well as the profit, π , are identical for both the MNE and the bureaucrat. This is a strong assumption since both the fines as well as the social cost probably are higher for the MNE than for the bureaucrat. Equation (8) shows the total monetary value of the bribes paid in an economy. This could be interpreted as the actual cost for the economy when we disregard the uncertainty of corruption. If the service would have been delivered as a tax service, Equation (6) would equal the tax cost the MNE would have paid. The total monetary value of corruption can be described as follows:

$$V = \sum_{j=1}^n v_j \quad (8)$$

where v_j is the monetary value of the j :th bribe with j going from 1 to n , with n being the number of transactions where it may be possible to offer a bribe. If Equations (4ii) and (5ii) hold, then:

$$v_j = \eta_j$$

For all other cases:

$$v_j = 0$$

In a developing economy, n can be assumed to be higher under decentralised corruption than under centralised corruption since there are probably a larger number of different bureaucrats that demands bribes in the former case than in the latter.

Equation (9) gives an account for the total cost of corruption that an MNE experiences in the host country. Here we include the cost of uncertainty.

Total corruption cost for the MNE is:

$$C_{MNE} = \sum_{j=1}^n c_j \quad (9)$$

where c_j is the expected cost of the j :th bribe. If both Equation (4ii) and (5ii) hold, then:

$$c_j = (\delta_j + \alpha_j) * \mu_j + \eta_j$$

If Equation (4ii) holds but not Equation (5ii) then:

$$c_j = (\delta_j + \alpha_j) * \mu_j$$

For all other cases:

$$c_j = 0$$

Table 2 describes the total cost of corruption for the MNE, providing a summary of the earlier discussion.

Table 2 Total cost of corruption for MNE

	IF $\chi_{BUR} \geq C_{BUR}$ then bureaucrat chooses corruption	IF $\chi_{BUR} < C_{BUR}$ then bureaucrat chooses no corruption
IF $\chi_{MNE} \geq C_{MNE}$ then MNE chooses corruption	$c_j = (\delta_j + \alpha_j) * \mu_j + \eta_j$	$c_j = (\delta_j + \alpha_j) * \mu_j$
IF $\chi_{MNE} < C_{MNE}$ then MNE chooses no corruption	0	0

The actual cost of corruption for the MNE is larger than the size of the bribe due to the risk of legal and social costs as described by Equation (3). Therefore, it would have been less costly for the MNE to invest in a country where the services would have been supplied as a tax service. Furthermore, corruption as opposed to a tax does not benefit the government but the individual bureaucrat. The tax income could, if used efficiently by the government, promote growth of direct investment through increasing the stock of human capital or improving market economy institutions. The tax income could also be used to combat corruption through the legal system or to raise the salaries of government bureaucrats. However, for taxes to be less damaging than corruption, this does not have to be the case. The only necessary condition is that there is less uncertainty involved.

One could of course argue that for some government services the MNE can choose to obtain these services legally through the bureaucracy, or by paying a bribe. If the bureaucracy is too rigid and too many

obscure rules result in a high degree of uncertainty as well as a large time loss, it might actually be more efficient for the MNE to pay bribes rather than to use the legal system, thus making corruption economically more efficient than bureaucracy. Bardhan (1997) suggests that when a country suffers from a rigid bureaucracy, bribes can actually speed up the decision making process. However, in such a system the bureaucrats themselves have an incentive to increase the amount of red tape, resulting in larger income from bribes.

The resulting effect of host country corruption is that the actual cost of conducting business activities in the country is higher than what could be expected based on observable costs such as wages or transport costs. Based on this reasoning, corruption gives rise to extra costs that the MNE has to operate in the host economy.

We now proceed to try to develop an expression that describes the general effect of host country bureaucratic corruption on total FDI inflows. We start by introducing a profit function for the MNE:

$$\pi(p, w, \eta) = \max[py - c(w, y, C_{MNE})] \quad (10)$$

where p indicates the world market price of the output y of the MNE, w is the price of production factors and C_{MNE} represents the total MNE cost of corruption as earlier. Use of the expression py implies that demand for the good in the host country is too small to have an effect on the price that the MNE receives for its output. This assumption is most suitable for an export-platform type of FDI as described in Ekholm et al. (2003), where the MNE production in the host country is exported to third country markets. This type of FDI is most likely to appear in developing economies where small domestic markets imply that FDI is resource-seeking rather than market-seeking. The profit function is, therefore, most appropriate for MNEs that operate in developing economies.

It might be argued that the MNE only starts production in the host country if the expected profit from doing so is larger than a minimum level of profits:

$$E(\pi) = [E(p)E(y) - c(E(w), E(y), E(C_{MNE}))] \geq E(\pi^{\wedge}) \quad (11)$$

where $\pi^{\wedge}$ is the minimum profit necessary for MNE entry. Therefore, a rise in C_{MNE} , the costs caused by corruption, should decrease the amount of FDI inflows that a host country receives due to the reduction of the expected profit. The minimum profit could also be interpreted as the minimum level of profit that is necessary in order for an MNE that is already established in the host country to continue operations. Consequently, it is also possible that MNEs already established in the host country decide to exit should the costs of corruption become too high.

3.3 Model implications

Government policies for reducing corruption

What kind of policy action could host country governments take in order to reduce bureaucratic corruption and thereby improve the conditions for attracting FDI inflows? Of the variables that are included in the model, the easiest one for government to affect should be the legal punishment variable, δ . By making legal punishment more severe, government increases the expected cost of engaging in corruption thereby reducing the expected net payoff of corruption. This can be achieved without creating any additional costs for the host country government. Efforts could also be made to increase the effectiveness of corruption investigations, increasing the μ variable in Equation (3). The social cost variable, α , can be assumed to be exogenous and therefore difficult for government to affect in the short run.

One of the explanations for the widespread existence of corruption in developing economies is the low salaries of government bureaucrats. Since the utility of money is usually assumed to be inversely related to the actual amount earned, a state employee with a low salary will benefit more from a given bribe than one with a higher salary.⁵ Increasing the salaries of government bureaucrats could therefore reduce

⁵Easterly (2002) reports that in India, the earnings connected to corruption for an executive engineer were as high as nine times his salary in the 1970s.

bureaucratic corruption. The length of time that a bureaucrat could expect to keep the job and the possibilities of advancement in the hierarchy raises the expected future income and thus increases the expected cost of corruption if the bureaucrat is fired after having engaged in corruption.

Thus, one can try to reduce corruption either by lowering the expected relative increase in income, for example by raising the salaries of the government employees, or by increasing the expected costs of engaging in corruption through more thorough investigations and/or more severe punishments. Finally, as can be seen in Equation (8), the amount of corruption in a society also depends on n , the number of transactions where a bribe might be used. The number of opportunities for bureaucratic corruption can be reduced by making the decision making process in the country more transparent and thereby limiting the bureaucrat's possibilities for opportunistic behaviour. This would decrease the incentives for engaging in corruption.

MNE effects on bureaucratic corruption

The fact that the quality of host country institutions should affect the entry decision of an MNE is a straightforward assumption. But could causality run in the other direction so that the actual operation of a foreign MNE affects the institutions in the host country? North (1990) suggests that organisations affect institutions. Based on this argument, how could an MNE affect host country institutions? How can MNEs' potential ability to affect host country corruption be taken into account in the framework that we have constructed? We argue that an MNE can affect the severity of corruption both before and after it has entered the host country. The link for MNE effects on corruption before entering the host country arises from the bargaining process between the MNE and the host country government. The host country government can offer incentives such as tax holidays to try to compensate for the costs of corruption. The host country government naturally has a certain influence on the potential activities of the MNE. The

government has the power to substantially influence the conditions under which investments can take place. On the other hand, the MNE also has bargaining power, assuming that the host country government regards the investment as beneficial for the country. Existence of corruption in the host country is something that an MNE can point to while negotiating the conditions for investment. The MNE could threaten to relocate production to another host country and demand formal business regulations to be improved in order to try to decrease the severity of corruption. This can be assumed to improve the efficiency of the legal system and increase the μ variable in the model. Wei (2000b) argues that restrictions of MNE operations in a host country and corruption might be positively correlated. It is indeed probable that a complex and restrictive regulatory FDI framework increases the problems of bureaucratic corruption if such a framework is also characterised by arbitrariness. On the other hand, the actual development during recent years has been towards host country deregulation of FDI restrictions, see UNCTAD (2002). The reason for this is that governments have a positive view of FDI and expect that the benefits from FDI outweigh possible disadvantages.

How can MNEs affect corruption after they have entered the host country? The presence of multinational enterprises may reduce the amount of corruption in the host country. If the MNE has a negative view of corruption and the MNE is powerful enough, it may influence the government to adopt anti-corruption policies and thereby increase both the μ and δ variables, reducing the total amount of corruption in the economy. Another possibility is that the MNE can affect the business culture and host country attitudes toward corruption, thereby increasing the α variable. A negative MNE attitude towards bureaucratic corruption could possibly influence domestic firms to adopt a similar stance.

The potential for MNE presence in the host country to affect bureaucratic corruption should be largest for the case where an MNE that operates mainly in economies where corruption is perceived to be low enters an economy that experiences more severe corruption. A hypothesis is that such an MNE is less

likely to take part in corrupt practices due to a negative attitude toward corruption, possibly reducing the severity of host country corruption through its influence. Table 1 shows that corruption is perceived to be low in developed economies but high in developing and transition economies. The implication is that FDI that flows from developed to developing and transition economies should provide the best possibility to reduce corruption. Table 3 describes the importance of inward and outward FDI for different types of economies.

Table 3 Inward and outward FDI stocks, millions of USD

Country group	Inward stock 2003	Outward stock 2003
World total	8 245 074	8 196 863
Developed	5 701 633	7 272 319
Developing	2 280 171	858 681
Least developed	56 821	3 732

Source: UNCTAD (2004) Annex Table B.3 and B.4

Note: The discrepancy between the size of inward and outward stock of FDI is caused by measurement error.

Table 3 shows that the majority of total FDI flows between developed economies. The developing economies have a very limited share of the total outward stock of FDI, close to ten per cent, and are therefore only responsible for a minor share of FDI. FDI inflows to both developed and developing economies are strongly dominated by MNEs located in developed economies. The inflows of FDI that developing economies attract are therefore to a great extent coming from economies where bureaucratic corruption is low, providing a possibility for FDI to reduce host country corruption.

On the other hand, if the MNE regards corruption as inevitable, MNE activities might increase corruption. As an MNE is likely to have a higher productivity than domestic firms, MNEs would be willing to pay higher bribes since its expected earnings are higher than those of domestic firms. As the size of bribes increases, more bureaucrats might become corrupt and/or the bureaucrats might try to create more red tape as to be able to extract more bribes from the MNE.

If MNE presence does tend to reduce the existence of corruption while corruption has a negative effect on the size of FDI inflows, there might exist virtuous and vicious circles. As long as the inward stock of FDI in a corrupt country remains small, corruption remains high, *ceteris paribus*, discouraging MNEs to

invest, thus keeping FDI inflows small and resulting in a vicious circle. However, if MNEs increase their production activities in the host country, they will achieve a growing influence on the economy. The MNEs might therefore be more and more reluctant to accept corrupt behaviour. MNE interaction with domestic firms might influence the behaviour of these firms and make them question existing business practices. This implies that the value of α in Equation (3) would increase, making bureaucratic corruption less likely to occur. MNE investment could therefore result in a reduction of corruption, which in turn decreases the MNE costs for operating in the economy, thereby improving the incentives for future foreign direct investment. If one also assumes that FDI-inflows and reduced corruption encourages economic growth this growth could further increase the size of future FDI inflows.

Empirical research on how foreign investors affect host country corruption is very limited. Hellman et al. (2002) is an exception focusing on the transition economies. The study uses the results of a firm level survey that allows separation of domestic firms and firms with a foreign ownership stake. Hellman et al. find that in general foreign firms do not show a higher standard of behaviour than domestic firms. There are indications that foreign firms have a greater propensity than domestic firms to engage in corruption in some circumstances.

4. Effects of host country corruption on FDI inflows

This section contains the empirical investigation. The objective is to try to verify the hypothesis that host country corruption reduces inflows of FDI.

4.1 The regression equation

The model developed in Section 3 suggests that the extent of host country corruption should have a negative effect on the size of FDI inflows. Is it possible to verify empirically that host country corruption reduces FDI inflows? To test this hypothesis, we use annual inflows of FDI as the dependent variable. Transparency International's Corruption Perceptions Index (TI) functions as a proxy for corruption. The

TI is introduced as the explanatory variable CORRUPT to take the extent of host country corruption into account. We transform the TI so that high figures correspond to a large amount of corruption.⁶

However, it is also necessary to control for other variables that affect the amount of FDI inflows that a host country receives. One important reason for MNEs to invest in foreign economies is market-seeking, trying to satisfy the host country demand for goods through local production. Most empirical studies of FDI determinants have tried to take into account the effect of market demand in the host country. GDP or population is normally used as proxies for local demand. Studies such as Culem (1988) and Brenton et al. (1999) have found that the size of GDP or GDP per capita has a significant effect on the volume of FDI inflows. Accordingly, we introduce GDP as an independent variable.

Resource-seeking FDI implies that the MNE motive for investment is exploitation of natural resources in the host country. Resource-seeking FDI is important for many developing economies that have a small manufacturing sector. The effect of host country natural resources is taken into account by the independent variable NATRES, which reflects the importance of natural resource exports for the host country.

MNEs can also be attracted to a host country as a result of low production costs. To control for such efficiency-seeking FDI we include the variable WAGE that functions as a proxy for labour costs in the host country.

It is also possible to argue that the degree of openness should affect MNEs decision to invest in a host country. An open economy environment makes it easy for the MNE to perform necessary import and export activities. Openness is defined as exports and imports divided by GDP. Earlier studies, such as Brenton et al. (1999), have found that flows of trade and FDI are complements. We, therefore, introduce the explanatory variable OPEN as a measure of the openness of the host country.

Based on this reasoning, the following regression equation has been constructed:

$$FDI_{it} = \beta_0 + \beta_1 CORRUPT_{it} + \beta_2 GDP_{it} + \beta_3 NATRES_{it} + \beta_4 OPEN_{it} + \beta_5 WAGE_{it} + \varepsilon_{it} \quad (12)$$

⁶The transformation is $CORRUPT = 11 - TI$.

We expect that CORRUPT and WAGE should have a negative effect while GDP, NATRES and OPEN all should affect FDI inflows positively.

4.2 Data

For the dependent variable, we use total, annual inflows of FDI. Optimally, we would have preferred to use bilateral flows of FDI but we have to make do with aggregate inflows. The Corruption Perceptions Index functions as a proxy for host country corruption and is described in some detail in Section 2.2. A panel dataset is used that generally includes data for 99 economies during the period 1996 to 2002. There are missing observations for some economies so we have an unbalanced panel dataset. We run the regressions on both the total dataset as well as a sub-sample for the developed economies and a sub-sample for the developing economies. Appendix A describes the economies that are included in the two sub-samples while Appendix B provides correlation matrices. Summary statistics are presented in Appendix C.

Table 4 provides a summary description of the variables that are used in the empirical analysis.

Table 4 Regression variables

Variable	Explanation	Data source and period	Expected sign of coefficient
<i>Dependent variable</i>			
FDI	Annual FDI inflow, millions of USD	WDI (2004), 1996-2002	na
<i>Explanatory variables</i>			
CORRUPT	Corruption Perceptions Index, proxy for host country corruption	Transparency International (2004b), 1996-2002	-
GDP	Host country GDP, proxy for market demand, USD	WDI (2004), 1996-2002	+
NATRES	Proxy for abundance of natural resources in host country,	Based on data from WDI (2004), 1996-2002	+

	natural resources' exports as share of GDP		
OPEN	Proxy for host country openness, imports and exports as share of GDP	WDI (2004), 1996-2002	+
WAGE	Annual host country wage in manufacturing as share of annual GDP per capita	Based on wage data from ILO (2005) and GDP per capita data from WDI, 1996-2002	-

4.3 Analysis

We start by analysing the total dataset. The Lagrange multiplier test (LM-test) and the Hausman test is used for each specification in order to determine whether a fixed effects model (FEM), a random effects model (REM) or OLS should be used. The results are presented in Table 5. The Breusch-Pagan-Godfrey test indicates that there is a heteroscedasticity problem. Therefore, the test statistics for the slope parameters are estimated by using the White heteroscedasticity consistent estimator for the total dataset as well as for the two sub-samples.

Table 5 Total dataset regression results

Independent variable	(1) REM	(2) REM	(3) FEM
Constant	8234.048 (1.76)*	10770.884 (1.44)	
CORRUPT	-1427.893 (-3.37)***	-1136.519 (-2.93)***	-1437.458 (-4.39)***
GDP	0.144E-07 (17.58)***	0.193E-07 (26.69)***	0.145E-07 (4.23)***
OPEN	4737.574 (1.84)*	499.504 (0.20)	4063.851 (2.14)**
NATRES	-7816.024 (-0.54)	- 25613.853 (-1.47)	
WAGE		-350.587 (-0.32)	
R ²	0.44	0.60	0.47
Adjusted R ²			0.46
N	448	262	497
Hausman specification test (Critical value at the 5 per cent level)	1.93 (9.49)	1.03 (11.07)	8.99 (7.81)

Note: t-statistics within parenthesis. The symbols *, ** and *** denote statistical significance at the 10, 5 and 1 per cent level, respectively.

The first specification includes the variables CORRUPT, GDP, OPEN and NATRES. The WAGE variable is excluded since there is a large reduction in the number of observations. For the first two specifications, the LM-test and Hausman tests indicate that a random effects model should be used. Host country corruption has a significant, negative effect on FDI inflows whereas both the size of the host country market (as measured by GDP) and openness increases the volume of FDI inflows. Abundance of natural resources in the host country does not seem to affect FDI inflows since the NATRES variable is insignificant.

The second specification introduces the WAGE variable. Unfortunately, when WAGE is included among the explanatory variables the number of observations drops substantially from 448 to 262. CORRUPT and GDP are still significant at the 1 per cent level despite the reduction in the number of observations. OPEN, NATRES and WAGE are insignificant.

Since NATRES is insignificant in the first two specifications we drop this variable as well as the WAGE variable for the third and preferred specification. The Hausman test indicates that a fixed effects model (FEM) should be used (the critical value at the five per cent level is 7.81).⁷ CORRUPT and GDP have the expected signs and are significant at the 1 per cent level, again suggesting that host country corruption and market size affects FDI inflows. The OPEN variable also has the expected positive sign and is significant at the five per cent level. The sizes of the coefficients are very close to those in the first specification. The same specification has also been used for a random effects model as well as for OLS providing similar results.

An increase in the TI index of one implies a reduction of FDI inflows of around 1 400 millions of USD. If a country such as Uruguay would be able to reduce the perceived severity of corruption (as measured by the TI) to the same level as Germany, the regression results indicate that FDI inflows would increase by more than 2 800 millions of USD per year. All in all, the regression results presented in Table 5 indicate that host country corruption indeed tends to reduce inflows of FDI confirming the results from earlier empirical research such as Wei (2000a).

Table 1 in Section 2.3 indicates that corruption is much more widespread in developing than developed economies. We also believe that the nature of corruption in developing countries is different from developed countries with the former having a higher degree of uncertainty and thus implying a higher cost of corruption as described by Equation (4iii). Corruption should, therefore, be more important for determining the volume of FDI that a developing economy receives than a developed economy. In order to investigate this hypothesis, we proceed by analysing the developed and the developing economies sub-samples separately. We start by analysing the developed economies sub-sample and the results are presented in Table 6.

⁷The null hypothesis for the Hausman test is that we have a random effect. The test statistic is chi-square distributed (χ_k^2) where k is the number of explanatory variables.

Table 6 Developed economies sample regression results

Independent variable	(1) REM	(2) REM	(3) REM
Constant	-21096.869 (-1.60)	-17099.025 (-0.76)	-17334.622 (1.57)
CORRUPT	-1488.906 (-0.71)	1775.745 (0.59)	-1800.035 (-0.97)
GDP	0.171E-07 (10.17)***	0.194E-07 (10.47)***	0.168E-07 (10.45)***
OPEN	39218.716 (3.82)***	10691.417 (0.79)	37462.850 (3.90)***
NATRES	30073.442 (0.42)	-14246.363 (-0.20)	
WAGE		9864.606 (1.21)	
R ²	0.43	0.58	0.42
N	150	107	155
Hausman specification test (Critical value at the 5 per cent level)	5.85 (9.49)	1.20 (11.07)	7.03 (7.81)

Note: t-statistics within parenthesis. The symbols *, ** and *** denote statistical significance at the 10, 5 and 1 per cent level, respectively.

The same three specifications as for the total dataset are used. The LM and Hausman tests indicate that a random effects model should be used for the developed economies sub-sample. In line with our expectations, CORRUPT is not significant for the developed economies sample according to Specification (1). However, both GDP and OPEN are significant at the 1 percent level and have the expected positive coefficients. NATRES is insignificant similarly to the results of the total dataset.

Inclusion of the WAGE variable in Specification (2) reduces the number of observations substantially to only 107. Only the GDP variable is significant.

For the third and final specification, CORRUPT is insignificant while GDP and OPEN are significant at the 1 per cent level. Our interpretation is that the uncertainty of corruption in developed countries is much lower than in developing countries, thus having a small effect on the expected profit of investing in developed economies. This would suggest that the β in Equation (2i) is very close to one in the developed economies. An explanation for this could be the high level of political stability in developed countries.

We proceed to run the same specifications for the developing economies sample. The results are presented in Table 7.

Table 7 Developing economies sample regression results

Independent variable	(1) OLS	(2) OLS	(3) OLS
Constant	2708.587 (2.65)***	846.405 (0.73)	2341.841 (2.74)***
CORRUPT	-435.189 (-3.73)***	-19.517 (-0.15)	-399.417 (-4.04)***
GDP	0.248E-07 (8.20)***	0.328E-07 (10.45)***	0.236E-07 (8.48)***
OPEN	878.811 (2.31)**	485.147 (0.95)	772.818 (2.30)**
NATRES	-1885.840 (-0.89)	-288.137 (-0.10)	
WAGE		-731.018 (-3.49)***	
R ²	0.58	0.80	0.57
Adjusted R ²	0.57	0.79	0.57
N	291	148	335

Note: t-statistics within parenthesis. The symbols *, ** and *** denote statistical significance at the 10, 5 and 1 per cent level, respectively.

For the developing economies sample, it turns out that inclusion of the observations for China removes the significant effect of corruption on FDI inflows. China has large inflows of FDI while at the same time having a large amount of corruption as measured by the TI index.⁸ The observations for China are, therefore, removed from the developing economies sample (excluding China from the total dataset does not substantially alter the results presented in Table 5). The LM-test indicates that OLS should be used for the developing economies sample.

As expected, host country corruption has a negative effect on FDI inflows to developing economies, as indicated by Specification 1. The variables CORRUPT and GDP are significant at the 1 percent level and the coefficients have the expected signs. OPEN is significant at the 5 percent level while NATRES is insignificant. There is a substantial amelioration in the explanatory power of the developing economies' sub-sample compared to the total dataset. This highlights the huge structural differences between developed countries on the one hand and developing countries on the other. If a country like Angola, with

⁸The apparent paradox of large Chinese FDI inflows and a high perceived corruption is discussed in Wei (2000b).

a high level of corruption, managed to decrease its corruption to the level of Botswana, an intermediately corrupt country, its FDI inflows would roughly double. This exemplifies how the deterrent effect of corruption on foreign firms' investment decisions can have large impact on the total level of FDI for many developing countries.

Specification (2) adds the WAGE variable. The number of observations is reduced to 148. Unlike for the total and developed economies' samples, WAGE is significant at the 1 per cent level and has a negative coefficient indicating that high wages reduce the amount of FDI inflows that a developing economy attracts. CORRUPT is no longer significant, and we believe that restricting the sample to only those where wage data is available creates a strongly biased sub-sample compared to the total dataset, since a disproportionately large part of the countries excluded due to inclusion of the WAGE variable are countries with structural problems like corruption. The results support the idea that, at least to a certain extent, the FDI in developing nations is efficiency-seeking, with investors being attracted by low wages.

Specification (3) indicates that host country corruption has a negative effect on FDI inflows for developing economies. Furthermore, we can see that the explanatory power of the three independent variables in the third specification is much stronger in developing than in developed countries implying that the investment decisions in developing countries are based on other criteria than in developed nations. The size differences of the parameters are mainly due to the fact that on average FDI is much higher in developed countries. The results of the third specification validate the ideas presented in Section 3, with corruption being a cost for the investors that drives profits, and thus the willingness to invest, down. We can also see that in developing nations trade and direct investments are compliments not substitutes, as can be seen on the positive effect of openness on FDI.

Summarising the findings of this section, our results indicate that host country corruption has a significant negative effect on FDI inflows to developing economies but not developed economies. Regarding the control variables the analysis shows that host country GDP and openness have a significant positive effect on FDI inflows. Labour costs only seem to be important for the distribution of FDI inflows

among the developing economies. No evidence was found that host country abundance in natural resources affects FDI inflows.

5. Conclusions

This paper analyses the relationship between host country corruption and FDI inflows. A model is developed that has two types of agents, bureaucrats and MNEs. The model describes how the interaction between host country bureaucrats and MNEs can result in corruption. Furthermore, the model describes how corruption increases the costs for MNE activity in the host country. The implications of the model provide some guidelines for government policies that could be used in order to reduce corruption. Making the legal punishment for corruption more severe or increasing the salaries of government bureaucrats are examples of policies that provide a possibility to reduce bureaucratic corruption.

The model predicts that the increase in costs caused by corruption discourages MNEs from entering, resulting in smaller inflows of FDI. The paper tries to verify this hypothesis empirically using Transparency International's Corruption Perceptions Index as a proxy for host country corruption. The empirical analysis concludes that host country corruption indeed has a significant negative effect on FDI inflows, verifying the results of earlier empirical research. More interestingly, the analysis shows that host country corruption has a negative effect on FDI inflows to developing economies but not to developed economies. A possible explanation for this is that the nature of corruption in developing economies implies a higher uncertainty, resulting in a cost of corruption that is higher than in developed economies. Decentralised corruption in developing economies implies that an MNE has to pay bribes to an unknown number of bureaucrats before access to the government service can be achieved.

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Appendix A Dataset

The table lists the countries that are included in the empirical analysis. The total dataset includes 99 countries. The developing countries sub-sample includes 76 countries and the developed countries sub-sample includes the remaining 23 countries.

Country	Sub-sample 0 = Developing 1 = Developed	Country	Sub-sample 0 = Developing 1 = Developed
Albania	0	Latvia	0
Angola	0	Lithuania	0
Argentina	0	Macedonia	0
Armenia	0	Madagascar	0
<i>Australia</i>	1	Malawi	0
<i>Austria</i>	1	Malaysia	0
Azerbaijan	0	Mauritius	0
Bangladesh	0	Mexico	0
Belarus	0	Moldova	0
<i>Belgium</i>	1	Mongolia	0
Bolivia	0	Morocco	0
Botswana	0	Mozambique	0
Brazil	0	Namibia	0
Bulgaria	0	<i>Netherlands</i>	1
Cameroon	0	<i>New Zealand</i>	1
<i>Canada</i>	1	Nicaragua	0
Chile	0	Nigeria	0
China	0	<i>Norway</i>	1
Colombia	0	Pakistan	0
Costa Rica	0	Panama	0
Croatia	0	Paraguay	0
Czech Republic	0	Peru	0
<i>Denmark</i>	1	Philippines	0
Ecuador	0	Poland	0
Egypt	0	<i>Portugal</i>	1
El Salvador	0	Romania	0
Estonia	0	Russia	0
Ethiopia	0	Senegal	0
<i>Finland</i>	1	Singapore	0
<i>France</i>	1	Slovak Republic	0
Georgia	0	Slovenia	0
<i>Germany</i>	1	South Africa	0
Ghana	0	<i>Spain</i>	1
<i>Greece</i>	1	Sri Lanka	0
Guatemala	0	<i>Sweden</i>	1
Haiti	0	<i>Switzerland</i>	1
Honduras	0	Tanzania	0
Hungary	0	Thailand	0
<i>Iceland</i>	1	Tunisia	0
India	0	Turkey	0
Indonesia	0	Ukraine	0
<i>Ireland</i>	1	<i>United Kingdom</i>	1
<i>Israel</i>	1	Uruguay	0
<i>Italy</i>	1	<i>USA</i>	1

Jamaica	0	Uzbekistan	0
<i>Japan</i>	1	Venezuela	0
Jordan	0	Vietnam	0
Kazakhstan	0	Zambia	0
Kenya	0	Zimbabwe	0
Kyrgyz Republic	0		

Appendix B Correlation matrices

Table B.1 Correlation matrix total dataset

Variable	CORRUP T	GDP	NATRES	OPEN	WAGE
CORRUP T	1				
GDP	-0.252**	1			
NATRES	0.161**	-0.185**	1		
OPEN	-0.071	-0.293**	0.200**	1	
WAGE	0.051	-0.034	-0.038	0.004	1

** indicates that correlation is significant at the 1 per cent level

* indicates that correlation is significant at the 5 per cent level

Table B.2 Correlation matrix developed economies sub-sample

Variable	CORRUP T	GDP	NATRES	OPEN	WAGE
CORRUP T	1				
GDP	0.172*	1			
NATRES	-0.383**	-0.287**	1		
OPEN	-0.165*	-0.522**	0.156	1	
WAGE	0.222*	-0.053	0.041	0.213*	1

** indicates that correlation is significant at the 1 per cent level

* indicates that correlation is significant at the 5 per cent level

Table B.3 Correlation matrix developing economies sub-sample

Variable	CORRUP T	GDP	NATRES	OPEN	WAGE
CORRUP T	1				
GDP	0.041	1			
NATRES	0.092	-0.129*	1		
OPEN	-0.308**	-0.342**	0.189**	1	
WAGE	0.174*	0.014	-0.073	-0.330**	1

** indicates that correlation is significant at the 1 per cent level

* indicates that correlation is significant at the 5 per cent level

Appendix C Summary statistics

Table C.1 Summary statistics total dataset

Variable	Variable cases	Mean	Standard deviation	Minimum	Maximum
CORRUP T	519	6.13	2.44	1.00	10.60
FDI	519	9493.56	27162.22	-4550.00	314007.00
GDP	519	0.41E+12	0.12E+13	0.10E+10	0.92E+13
NATRES	460	0.57E-01	0.72E-01	0.18E-02	0.50
OPEN	497	0.80	0.41	0.17	2.31
WAGE	282	1.33	0.89	0.13	6.65

Table C.2 Summary statistics developed economies sub-sample

Variable	Variable cases	Mean	Standard deviation	Minimum	Maximum
CORRUP T	158	3.20	1.51	1.00	7.58
FDI	158	24 058.04	44 775.13	50.00	314 007.00
GDP	158	0.11E+13	0.20E+13	0.79E+10	0.92E+13
NATRES	152	0.36E-01	0.44E-01	0.19E-02	0.25
OPEN	155	0.75	0.34	0.18	1.99
WAGE	112	1.21	0.41	0.70	2.86

Table C.3 Summary statistics developing economies sub-sample

Variable	Variable cases	Mean	Standard deviation	Minimum	Maximum
CORRUP T	361	7.42	1.47	1.70	10.60
FDI	361	3 119.08	7 309.27	-4 550.00	52 700.00
GDP	361	0.10E+12	0.19E+12	0.10E+10	0.12E+13
NATRES	308	0.68E-01	0.80E-01	0.18E-02	0.50
OPEN	342	0.83	0.44	0.17	2.31
WAGE	170	1.41	1.09	0.13	6.65